Keeping Sydney liveable, productive and thriving for a sustainable future

Update to 1 July Price Proposal

12 November 2019

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1 Executive summary

Key messages

- With drought conditions intensifying, we need to invest more to keep the city resilient and respond to the demands of drought.
- In light of our increased challenges, it is prudent for us to seek additional funding from our customers. With water restrictions now likely to apply for at least part of 2020–24, we face a sustained reduction in water revenue, and a requirement to spend significantly more to meet the needs of our customers and our assets at a time of water supply stress.
- We are now seeking a total expenditure package of up to $11.4 billion over 2020–24. This includes capital expenditure of up to $5.5 billion and operating expenditure of up to $5.9 billion. This is 20% more capital expenditure and 9% more operating expenditure than we sought in July.
- Where activity is ongoing, we have incorporated costs into base prices. For activities only required during drought, we propose costs be passed through only when needed. Given the inherent uncertainty in drought and changes in demand, we consider this is the best way to manage our funding needs, while not putting undue costs on customers.
- We have held back the increase in operating expenditure by committing to additional savings of $89 million over the period. We recognise that we need to find ways to be more efficient at the same time as we ask our customers to fund more investment.
- Our increased expenditure will deliver upgrades so that we can transfer water around our network to areas that need it most; improve our response to leaks and breaks; help us partner with the community to save water and increase water conservation activities. We will also respond to environmental requirements to do more to limit wet weather overflows.
- Including all our potential drought cost pass-throughs, a typical household bill will be 2.5% higher in 2020–21 than this year. Customers can reduce this impact by saving water – a 20% decrease in water use can save a household around $100 a year.
- If government proceeds to expand the Sydney Desalination Plant, bills may be much higher by the end of the period, depending on the costs agreed by government and IPART. If the expansion of the desalination plant does happen, the higher capital expenditure we propose to upgrade our network will be locked in to be recovered from future customer bills.
- However, if drought abates, about 60% of the increased operating expenditure will no longer be needed, so customers should see some reduction in bills.
- The combination of drought and extremely low interest rates places us in a challenging financial position. Our cash flows need protection against the risk of significantly reduced water demand, and we need IPART to carefully consider the cost of capital it applies. IPART should determine prices to ensure it strikes the right balance between affordability for our customers and our financial resilience.

1.1 Update to our Price Proposal

On 1 July 2019 we submitted our Price Proposal for 2020 to 2024. We set out the investments we need to deliver to turn around our environmental performance and deliver the services that customers in our growing city expect. This includes managing leaks, breaks and wastewater incidents, works on our Hawkesbury-Nepean wastewater treatment plants to meet tighter nutrient load caps, building a new wastewater treatment plant in Western Sydney, and supporting government plans for a water sensitive Sydney.

We will continue to investigate the role recycled water can play, and over the next 25 years we expect to double our water recycling to more than 80 billion litres a year. We will also continue our transition to a digitally connected utility, to improve our customer service and make better use of data in decision-making.

Since July, the challenges we face in serving our customers have come into sharper focus, and the requirement for us to invest more has become clearer. There has been little rain over winter, water restrictions appear likely to continue, and the NSW Government has decided to commence preliminary planning for the expansion of the Sydney Desalination Plant.

We need to be more ambitious in engaging our community and customers in programs to improve water efficiency. This will involve campaigns to encourage sustained reductions in water use and long-term behavioural change.

We also need to make Sydney more resilient to climate change and periods of drought, by connecting water supplies from dams across Sydney. This will improve water security for parts of the city that are more exposed to drought.

We must commit even more resources than we indicated in July to managing our networks. We need to ensure our front-line crews have the capacity to rapidly fix the higher level of leaks and breaks we experience in drought, and to turn around our performance in managing wastewater overflows.

We said in July that we would invest what was needed to address the impact of drought, and this remains the case. However, given the increased scale of the challenge, it is now essential for us to ensure we have sufficient funding to support a more resilient city. This is why we have revised our proposal to IPART. In submissions to IPART's Issues Paper,[1] we heard feedback that our stakeholders support Sydney Water increasing its expenditure to manage drought and increase system resilience.[2] They emphasised that long-term planning should take ongoing impacts of climate change into account, not regard drought conditions as temporary variations from historical averages.

This aligns well with our revised funding proposals. Some of the new expenditure will only be needed if drought-related triggers are met, such as lower dam levels. However, much of it is built into our base forecasts as it will increase resilience, both for this drought and the next. This includes projects to improve network connectivity, work with our customers to improve long-term

[1] IPART 2019, *Prices for Sydney Water from 1 July 2020 – Issues Paper September 2019*
[2] For example, the Public Interest Advocacy Centre, Flow Systems and the Centre for Sydney all supported the costs of drought and climate change being included in water agencies' pricing proposals.

water efficiency, and ongoing investigations into water use and infrastructure resilience. During times of drought, we would increase our base levels of activity and implement other drought response measures, in line with the NSW Government's policy and plans.

To ensure the new package is as affordable as possible for our customers, we have revisited how much we can achieve in efficiencies to reduce the scale of expenditure and price increases. We have decided to eliminate $89 million from the operating expenditure we would otherwise be seeking, on top of the $104 million of savings identified in our July 2019 Proposal, and assign that amount as savings which we commit to find over the period.

Given this new outlook, we are now seeking a total expenditure package of up to $11.4 billion over 2020–24. This includes total capital expenditure of $5.5 billion (a base of $5.1 billion plus $368 million if drought continues)[3] and $5.9 billion in operating expenditure (a base of $5.5 billion plus $347 million if drought continues).

1.2 We need to invest more

Our current expenditure is already significantly exceeding the allowances granted by IPART for 2016–20, reflecting the demands of growth, drought and resilience, while maintaining service performance and customer service.

We are now proposing up to $1.4 billion of additional expenditure to 2024, on top of our July proposal. This includes a further $0.9 billion of capital expenditure (a 20% increase on our July proposal of $4.5 billion) and a further $481 million of operating expenditure (a 9% increase on our July proposal of $5.4 billion).

We expect much of this extra investment to be needed from the start of the price period. Our prices throughout the period, including pass-throughs, will reflect the impacts of drought. They cover the costs of network expansions to build system resilience and helping the community save water, including through implementing water restrictions, driving customer behaviour change to value and conserve water and increasing investment in water conservation. Prices also need to be slightly higher to recover our normal revenue levels, because funding our operations costs as much, or more, in times of low water sales.

The costs of expanding the Sydney Desalination Plant will only be included in our prices if the NSW Government decides to proceed. This will involve Sydney Desalination Plant Pty Ltd building the extra plant capacity, as well as Sydney Water upgrading the water network to receive more water. If it proceeds, our network upgrades to cater for an expanded desalination plant comprise almost half the extra capital expenditure we propose. We will also need to pass through the costs of further water conservation measures that will be required if dams continue to fall.

In total, we are proposing to double the level of capital investment that IPART approved for 2016–20,[4] and to increase by 11% the operating expenditure granted to us for the same period.[5]

[3] Excludes finance leases.

[4] IPART granted us a capital expenditure allowance of $2.7 billion for 2016-20. We are now proposing capital expenditure of $5.5 billion for 2020–24.

1.3 Increasing our system resilience

The investments outlined below are needed to manage drought and meet customer expectations for a secure water supply. They are in addition to the expenditure we proposed in July 2019 to improve our environmental performance, maintain high quality services and manage growth.

1.3.1 Water supply resilience for this drought and beyond

We operate the water delivery system as a single network. We direct flows between storage reservoirs and distribution systems to optimise demand and supply, and meet Operating Licence requirements for water supply interruptions, quality and pressure.

Drinking water link from Prospect to Macarthur

The drought is causing the southern dams to deplete more quickly than Warragamba Dam. We will link the Prospect South and Macarthur water distribution systems. During drought conditions, Macarthur customers will be able to receive water from the Prospect System (from Warragamba Dam), slowing the depletion in the southern dams. The link is two-way, so water from the Macarthur system can also be sent to the Prospect system. This represents $561 million in new capital investment, including $77 million to be spent in 2019–20. It will also have long-term benefits for growth in parts of the south-west.

Cascade water upgrades

We need to enhance the drought resilience of our Cascade water system that supplies the Blue Mountains. We will upgrade the Cascade Water Filtration Plant so that it can treat water from a new raw water source. This investment will unlock an additional water source for local supply. We will also increase the capacity of the emergency supply from the Orchard Hills System (supplied from Warragamba Dam), slowing the depletion of Oberon Dam as some customers in the Blue Mountains could be supplied from Warragamba Dam. We expect these projects to cost $46 million, including $5 million in 2019–20.

Network upgrades for expansion of the desalination plant

If drought conditions worsen, the government may need to expand the desalination plant to deliver 30% of our water supply. If this occurs, we will also need to ensure we can receive and distribute the extra drinking water from the desalination plant. Our existing infrastructure can only deliver it to the Potts Hill Water Delivery System (1.6 million people). We will build a pumping station, storage tank and other assets at an estimated cost of $436 million, including $70 million in 2019–20, to ensure water from the plant can be transferred to the wider Prospect System. This will mean the majority of our customers have access to a climate-resilient source of supply.

These costs would be passed through to customers only if and when the government decides to proceed with the expansion.

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[5] IPART granted us an operating expenditure allowance of $5.3 billion for 2016-20. We are now proposing operating expenditure of $5.5 billion for 2020–24, including most costs to be passed through when triggered by government decisions.

1.3.2 Increased focus on water conservation

Partnering with our customers to save water

Drought highlights the value of saving water. Water restrictions are currently in place and we know the government will require customers to save water while the drought continues. We also know that with climate change, we want to change attitudes and encourage a stronger conservation mindset. We are committed to encouraging long-term changes in behaviour to drive sustained reductions in water use per capita.

We are seeking up to $410 million in funding to engage, inform, encourage and enable our customers to maximise water efficiency. This includes oversight and enforcement of water restrictions by our Community Water Officers. It also covers a heightened level of advertising, water conservation program development and rollout, water use data and analytics studies, and infrastructure resilience investigations. Our water conservation programs to enable customers to become more water efficient will need to intensify with deepening drought.

We are starting a review of the Economic Level of Water Conservation methodology. The method requires us to conserve more water as dam levels fall and implement water efficiency activities where it is economic to do so. We want to ensure our investment meets community expectations and fully reflects the value of water conservation to our city. We expect to complete the review by June 2020.

1.3.3 Managing leaks and chokes

We now have better information on the reactive workloads required to manage dry conditions, and more certainty that we need to keep doing more for longer.

Responding to leaks and breaks and wastewater overflows

We propose increased operating expenditure to further improve our operational response to leaks and breaks in our networks. Our experience in 2019–20 has given us greater understanding of the impacts dry soil conditions have had on both our water and wastewater networks, and what we need to do to respond.

New environmental requirements

The Wet Weather Overflow Abatement program addresses wastewater overflows which occur when rain inundates sewers. In August 2019, the EPA advised us that we must achieve a higher target over 2020–24 than we assumed for our Price Proposal. The EPA noted a perception of low expenditure since 2012 and heightened community expectations. To meet this, we will need to invest an additional $52 million in accelerating our 'source control' work into other catchments.

1.4 How we will manage the impacts of drought

1.4.1 Some costs are in new base forecasts

As recognised by stakeholders, dry conditions and drought may be ongoing impacts of climate change, not just temporary aberrations. Some of our expenditure reflects this expectation.

Regardless of whether drought continues throughout 2020–24, we need to implement water efficiency campaigns and programs to engage our community to increase long-term water saving behaviours. We also need to enhance the connectivity of our water distribution systems, and ensure our front-line crews are resourced to manage leaks and breaks and respond to the record levels of wastewater overflows we are experiencing. Even when drought breaks, we expect to need higher levels of resources to continue to manage the ongoing impacts of dry conditions on our systems. This investment will increase our system resilience for this drought and beyond.

1.4.2 Some costs will be passed through only during drought

Some of our expenditure will only be needed while certain triggers are met or if drought deepens. For example, under the Metropolitan Water Plan,[6] detailed planning for expansion of the desalination plant is due to be underway if dams reach 40%, with construction at 35%. However, the government may choose to start planning or construction earlier; or if dam levels rise, the expansion may not be needed.

Similarly, the additional costs we incur to implement water restrictions on behalf of the government will only be needed while restrictions are in place. If restrictions are lifted part-way through 2020–24, these costs will no longer need to be passed through to customers.

A cost pass-through mechanism is an appropriate way to manage investments which may or may not proceed part-way through the price period. These mechanisms are an effective way of capturing other cost changes within a price period like inflation, WaterNSW costs and existing desalination costs. They mean that a portion of the risk remains with us, instead of passing the entire risk onto our customers.

We have forecast the costs for each investment and identified likely trigger levels. We will make investments for drought as needed; however, costs would only be passed through to customers once the trigger levels are reached. This mechanism could recover:

- $436 million to augment our network to receive, store and distribute water from the expanded desalination plant, triggered if and when the government decides to expand the plant
- up to $240 million for further water conservation programs, if dams continue to fall
- $106 million to implement water restrictions (including patrols and increased advertising) and drought management.

Our expenditure forecasts do not include third-party costs that may also be passed through to our bills. This includes additional costs for drought sought by WaterNSW in their July 2019 price proposal to IPART,[7] and costs of doubling the desalination plant's capacity. These costs cannot be forecast yet and will be subject to an IPART determination.

To ensure we can recover the full costs we need to spend, we propose all new drought cost pass-through items be added to the water service charge.

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[6] NSW Government, 2017, *Metropolitan Water Plan: Water for a liveable, growing and resilient greater Sydney*
[7] WaterNSW has sought $280 million for drought measures, including enabling access to deep water in Avon Dam. These costs will be subject to review by IPART, including how they should be passed through to our bills.

1.4.3 We will also recover lost revenue due to water restrictions

In 2012 and 2016, IPART decided to include a demand volatility adjustment mechanism for material variations in demand. This allows prices to be adjusted for changes in demand outside our control, when water sales are outside a 5%[8] threshold above or below our approved demand forecast.

The mechanism currently operates between price periods. Changes in demand are considered over the total price period, and there is up to a four-year lag before over or under recoveries can be recovered. We propose that prices be adjusted with only a one-year lag while water restrictions are in place, to help maintain our cash flow. This does not generate additional revenue – rather, it restores revenue we ought to receive, but are losing due to drought. The inclusion of a one-year lag in the pass-through, and the materiality threshold of 5% variance, retains a portion of the risk with us, rather than passing the entire risk onto customers.

1.5 Financeability

In July, we proposed a real post-tax cost of capital of 4.1%, consistent with IPART's February 2019 update. In August 2019, IPART updated the cost of capital to be 3.8%. We have adopted this latest figure. Our capital structure is more highly geared than in the past. We have moved from 33% debt in 2007 to 58% today. This change followed NSW Treasury's 2016 Capital Structure Policy for Government Businesses.[9] As a result, our credit rating was downgraded in December 2018 from Baa1 to Baa2 – the target rating under the capital structure policy.

Our previous relatively low gearing meant we were able to absorb borrowing for projects, such as funding the desalination plant. Our headroom for more debt for such projects, without paying down old debt or growing our revenue base via connections, may be more limited in the future.

In addition, the combination of drought and exceptionally low interest rates may place unusual stress on our finances. The combination of an uncontrollable large reduction in our water demand revenue, combined with an exceptionally low regulatory return on capital (particularly if the 3.2% cost of capital forecast by Hunter Water is applied by IPART), could place stress on our financial metrics. We hope IPART will work with us to ensure that our prices strike the right balance between affordability for our customers and the financial resilience of Sydney Water.

1.6 Impacts on prices and bills

1.6.1 Some prices will increase

Our base prices reflect our revised expenditure forecasts, the additional efficiency target we have set ourselves, and IPART's latest published cost of capital. During drought, water charges will rise further, to recover the costs of our drought response measures.

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[8] IPART, 2016, *Review of Prices for Sydney Water Corporation from 1 July 2016 to 30 June 2020, Water – Final Report,* June, p 151.
[9] NSW Treasury, 2016, *Capital Structure Policy for Government Businesses*, August

Assuming the drought continues, we propose:

- a water usage price of $2.24/kL from 2020–21. This is our base price of $2.11/kL[10] with a $0.13/kL uplift when the desalination plant is operating
- a water service charge for a residential customer ranging from $142 to $156[11] a year from 2020–21, depending on drought conditions. This includes cost pass-throughs for our drought response measures. We have not included potential third-party pass-through costs for WaterNSW drought measures or building the expanded desalination plant
- in addition, water prices will be further adjusted each year to account for some under-recovery of revenue due to water restrictions.

If the drought ends, water prices will decrease, as we stop passing through costs that are no longer needed. This would see the water usage price reduce to $2.11/kL, and the residential water service charge reduce to our updated base charge of $98 a year.[12] The extra projects and activities we have proposed to improve long-term system resilience will continue to be delivered.

About 50% of a typical household bill covers wastewater costs. We maintain our July proposal for a wastewater usage charge of $0.61/kL, a 48% drop compared to 2019–20. We do not consider it appropriate to base the wastewater usage charge on long-run marginal costs at this time.

Our wastewater residential service charge will be $563 a year in 2020–21, an 8.6% decrease compared to 2019–20. This includes the increased expenditure needed to meet new environmental regulatory requirements, and a sustained increase in our operational capability to respond to wastewater incidents. This higher resourcing need will continue even when drought ends, as we will have a build-up of roots in pipes that cause faults and overflows.

Our updated stormwater prices are $81 a year for a house, and $25 a year for an apartment in 2020–21. This is a 2.7% increase compared to 2019–20, which is less than the increase we proposed in July. These changes are mainly related to the lower cost of capital.

From 2021–22, prices will rise with inflation until 2023–24. We have not proposed other changes to price structures. A full suite of 115 prices has been calculated to reflect the lower cost of capital, and actual data and parameters for 2018-19. These are presented in Appendix 2.

1.6.2 How this will affect bills

The likelihood that drought will continue means bills will probably go up in the next price period, to cover our increased expenditure to improve water supply system resilience and security.

Figure 1-1 illustrates the impact to a typical residential customer bill of our proposed drought cost pass-throughs. It assumes drought conditions remain for the whole price period, from July 2020 through to June 2024.

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[10] This is the water usage price from our July 2019 Proposal, adjusted for actual CPI in 2019-20.
[11] $2019–20
[12] This assumes the network upgrade required for an expanded desalination plant or any other capital expenditure determined as a drought cost pass-through has not commenced. Once triggered by a government decision, capital expenditure triggered by drought conditions will remain on bills.

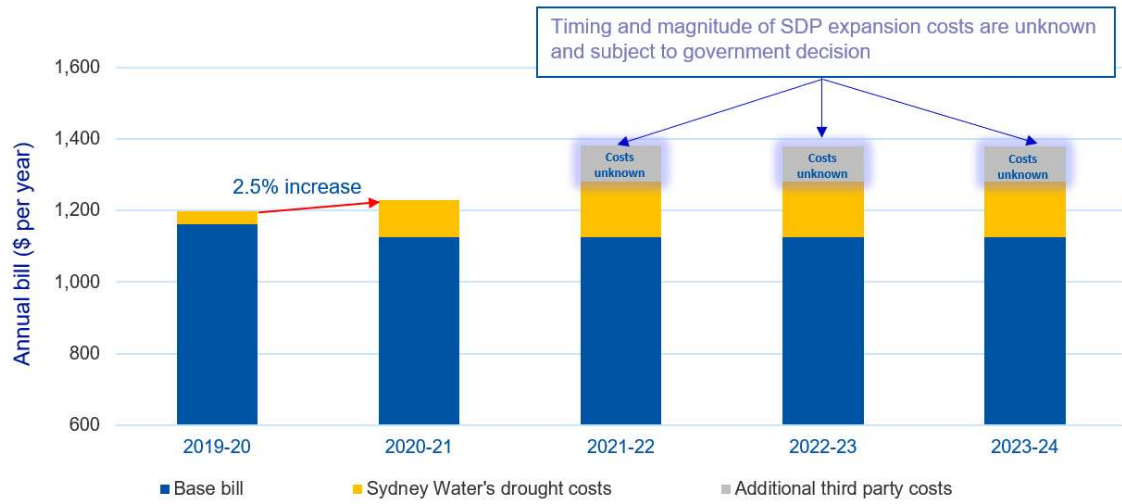


Figure 1-1 Real residential bill impact showing drought costs (assuming unrestricted consumption of 220kL/year)

Assuming drought continues, a bill for a typical residential customer in 2020–21 will:

- increase by 2.5%, or $30 a year, to $1,228 ($2019–20) compared to 2019–20, based on our updated base prices and all our proposed drought cost pass-throughs[13]
- increase by a larger amount when including third-party drought costs. This will primarily be driven by a government decision to expand the desalination plant. The timing and magnitude of this cost is uncertain. Third-party costs will be determined by IPART before being passed through to our bills.

This compares to bills remaining relatively flat in real terms, which we proposed in July.

If drought deepens and more drought measures are needed, bills will increase further.

Non-residential customers will experience a range of bill impacts, depending on their meter size, discharge factor and water use. Most non-residential customers will see a bill increase of three to seven per cent due to the pass-through of drought costs, compared to 2019–20.

A range of other factors could change customer bills over 2020–24, including the cost of capital IPART will use to calculate prices and how much customers choose to reduce their water use.

Customers can help reduce their bills by saving water

For illustrative purposes, the bill impact shown above does not include any bill reduction for lower water use during restrictions. However, we expect that most customers will respond to water restrictions and campaigns encouraging them to save water during the drought. The best way for

[13] This assumes the continued operation of the current desalination plant and Shoalhaven transfers, increased expenditure to improve the resilience of our system, the pass-through of costs for new Sydney Water drought measures and a revenue adjustment for restrictions.

customers to help minimise bill increases is to reduce their water use. The amount a customer can save will depend on how much, for example:

- a customer who reduces their water use by 10% will save around $50 a year
- a customer who reduces their water use by 20% will save around $100 a year.

We will continue to encourage customers to save water, and work with government to achieve targeted savings under restrictions. We will support these efforts through patrols, as well as advertising, education programs and water efficiency campaigns. We will ensure customers have the information and support available to help them understand how they can save water.

However, if the drought gets worse, customers may still face higher bills. We need to be honest with our customers that while saving water will always help to lower bills, drought will continue to put upward pressure on prices.

1.6.3 We will continue to support customers

We are aware of the social impact of bills on our customers. We will continue to support customers who experience payment difficulty through our assistance and payment options, as outlined in our Proposal.

Pensioner concessions and financial assistance for customers experiencing payment difficulty are funded by the NSW Government. Our long-standing pricing policy has been to keep pensioner bills at parity with non-pensioner bills; that is, pensioner bills should increase or decrease by a similar percentage to the bill for a typical residential household.

We will work with government to minimise the impact of bill increases on pensioners and vulnerable customers.

1.7 Structure of this Update

In this Update we present what has changed since July, including revised expenditure forecasts, prices and bill impacts. For detail on our role and function, service levels and performance, customer engagement, regulatory framework proposals, water demand forecasting process, recycled water and asset management governance, refer to our 1 July 2019 Price Proposal.

In this Update:

- we have updated actual expenditure for 2018–19
- we present dollar amounts in either ‘nominal’ (with inflation) or ‘real’ terms (without inflation), depending on the context
- unless noted otherwise, we show dollars of the 2019–20 financial year
- we have used an actual CPI to calculate 2019–20 prices, then an assumed CPI to estimate nominal dollars in a future year after 2019–20. We use an assumed inflation rate of 2.5%, the mid-point of the Reserve Bank of Australia’s target band for general price inflation
- some totals may not add precisely, due to rounding.

1.7.1 Chapters

Chapter 2 - Expenditure details changes to our capital and operating expenditure forecasts, to deliver our new investments. It also captures minor factual updates such as reprofiling our expenditure for critical sewers and wastewater deep ocean outfalls, correcting a small error in our Build Own Operate water filtration plant costs, and savings in our forecast digital expenditure.

Chapter 3 - Managing drought risks — pass-through mechanisms presents more detail on our methods to recover additional costs and foregone revenue arising from drought.

Chapter 4 – Revenue requirement sets out our updated revenue requirement for 2020-24.

Chapter 5 - Prices presents our prices for major services. Most of the changes will impact the water charges, with some impact on wastewater and stormwater charges. Some errors in the previous modelling of trade waste prices are also corrected. A complete set of 115 prices is provided in Appendix 2.

Chapter 6 – Bill impact and affordability provides an updated view of overall bills, depending on some key scenarios such as drought continuing or ending, and how much water a customer saves. It also details our affordability measures.

Chapter 7 - Financeability presents a detailed update on the potential impacts of drought on our financeability metrics.

$10.5 billion
base revenue
needed to run our business and deliver our essential services

$5.0 billion
capital expenditure
to grow and renew our infrastructure and improve system resilience

$5.5 billion
operating expenditure
to maintain the services our customers value and improve long-term water efficiency

2 Expenditure

Key messages

- We have re-assessed our expenditure needs in light of extended drought. It is now clear that we need to invest more to manage supply risks, protect the environment better and meet customer expectations.
- Our total forecast expenditure during 2020–24 has increased to up to $11.4 billion. This includes $5.5 billion in capital expenditure and $5.9 billion in operating expenditure.
- Most of this is built into our base forecasts as it will increase system resilience for this drought and beyond. Some, including $368 million in capital and $347 million in operating expenditure, will only be needed if drought-related triggers occur.
- We have set ourselves an efficiency target of $89 million in operating costs, as well as other measures to help keep water bills affordable for customers.
- As well as drought, this Update captures additional expenditure to meet new environmental requirements, small savings in digital expenditure, and other minor factual updates.

As our operating environment is always evolving, expenditure forecasts are regularly re-assessed in light of new information. Since we developed the July 2019 Price Proposal circumstances have changed significantly, including the intensification of the drought.

Updated base capital and operating expenditure

It is now clear drought conditions are having a more significant and lasting impact on our operating and capital expenditure than originally expected. We have updated our forecasts based on new analysis of the water supply risks. The major updates to our base capital expenditure forecast:

- respond to the current water supply risks and impacts, and
- greatly improve the system's resilience to future drought and other contingencies.

Additional base capital expenditure of $550 million increases the total forecast for 2020–24 to $5,087 million, from $4,537 million in our price proposal.

The net increase in base core operating expenditure of $135 million increases the total forecast for 2020-24 to $4,047 million, from $3,912 million in our proposal. The largest proportion of this relates to sustained changes in activities and activity levels which began with the current drought.

This also includes the additional efficiency challenge we have committed to, which reduces the total updated operating expenditure by $89 million.

Potential pass-through expenditures

There is significant uncertainty about events which could trigger additional capital and operating expenditure. We propose that these expenditures be treated under a cost pass-through framework (detailed in Chapter 3), and only recovered if certain defined triggers are met.

2.1 Overview of updates

2.1.1 Updated base capital expenditure

The updated capital expenditure profile is compared with our original forecast in Table 2-1.

Table 2-1 Base total capital expenditure original forecast and update ($2019–20 million)

Capital expenditure	2020–21	2021–22	2022–23	2023–24	2020–24 Total
Price Proposal forecast	1,004	1,024	1,249	1,260	**4,537**
Updated forecast	1,524	1,183	1,220	1,160	**5,087**
Increase	520	159	-29	-100	**550**

Two water supply security investments make up 95% of the increase. The other updates respond to a change in environmental regulation and a change in the IT service strategy. Figure 2-1 shows the updated capital expenditure updates under the main drivers.

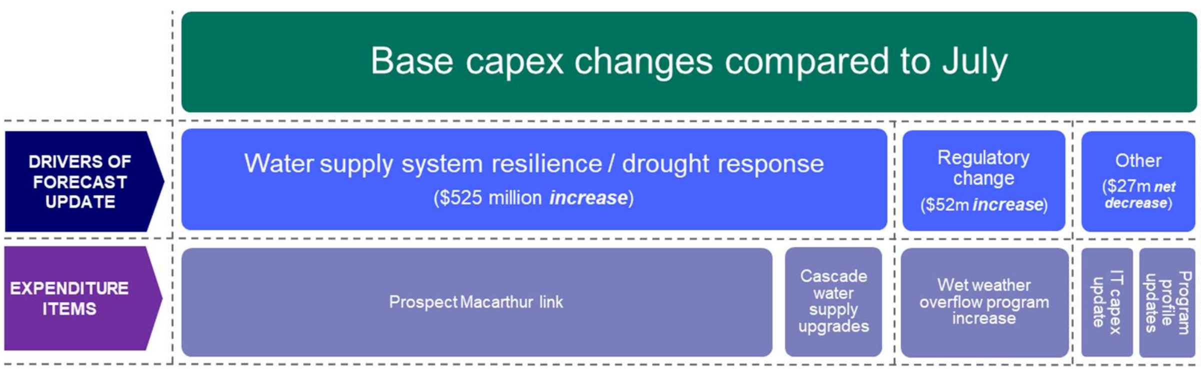


Figure 2-1 Base capital expenditure forecast by driver

The relative increases in capital expenditure due to drought resilience and non-drought items are shown in Figure 2-2.

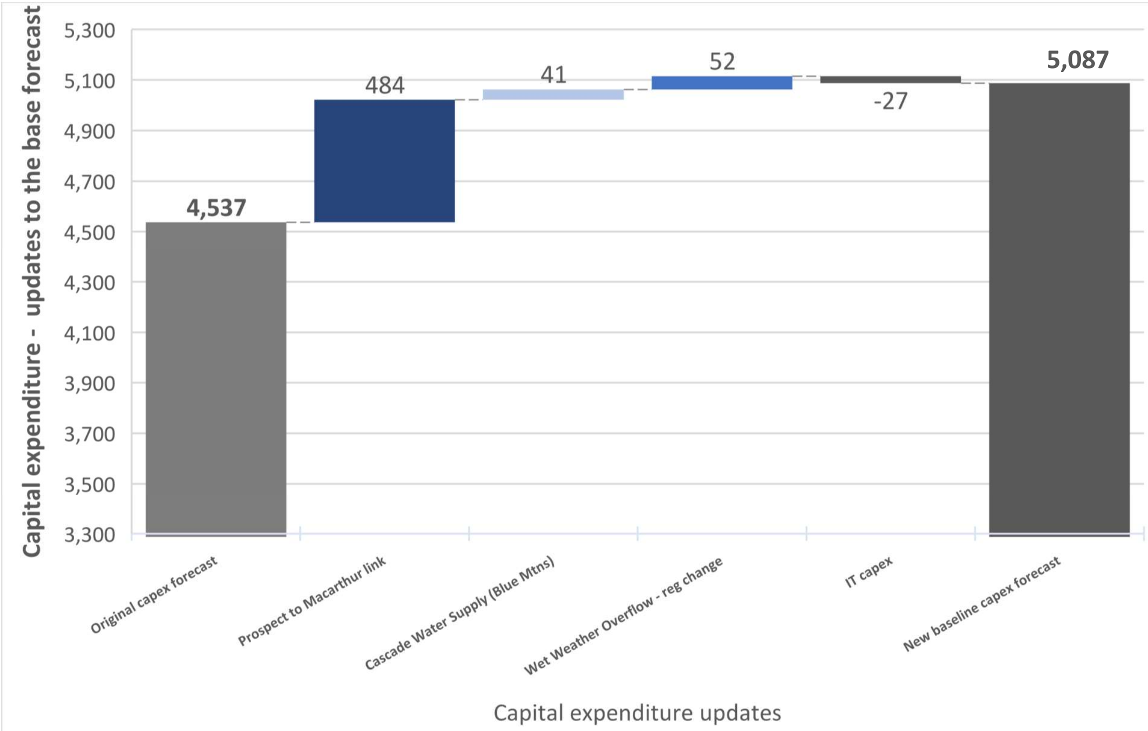


Figure 2-2 Variations to capital expenditure forecast

The annual profiles of these items are shown in Table 2-2, along with profile changes for two projects. There are also changes to 2019–20 forecasts in some cases.[14]

Table 2-2 Base capital expenditure forecast changes ($2019–20 million)

Capital expenditure		2020–21	2021–22	2022–23	2023–24	2020-24 Total
Water supply resilience infrastructure	Prospect to Macarthur link	399.5	22.8	62.0	0.0	**484.2**
	Blue Mountains (Cascade) Water supply	29.1	12.0	0.0	0.0	**41.1**
Regulatory change	Wet Weather Overflows - regulatory change	20.0	27.7	6.7	-2.3	**52.1**
Other drivers	Digital capital expenditure	-6.0	-12.9	2.0	10.1	**-27.0**
	Critical Sewers (re-profiled)	75.7	80.8	-78.0	-78.6	**0**
	Deep Ocean Outfall plant (re-profiled)	2.0	28.6	-21.3	-9.2	**0**
	Annual totals	520.2	158.9	-28.6	-100.2	**550.4**

[14] These have been submitted to IPART via the SWC limited AIR SIR for 12 Nov 2019 update to price proposal.

2.1.2 Updated base operating expenditure

The updated core operating expenditure profile is compared with our original forecast in Table 2-3.

Table 2-3 Base total operating expenditure original forecast and update ($2019–20 million)

Core operating expenditure	2020–21	2021–22	2022–23	2023–24	2020-24 Total
Price Proposal forecast	972	976	980	983	**3,911**
Updated forecast	1018	1027	1010	992	**4,047**
Difference	46	50	30	9	**135**

The largest changes are because we need to sustain our increased activity in response to drought. Our Price Proposal forecasts did not include these, as we did not expect them to continue into 2020–24. However, we now consider it is prudent to maintain these activities on an ongoing basis. For example, communication of efficient water use messages to customers.

The next largest increases are for costs when the new infrastructure is in service. An important change is that the forecast now includes an efficiency reduction of $89 million. We recognise that we need to find ways to be more efficient at the same time as we ask our customers to fund more investment.

Figure 2-3 Base operating expenditure updates by driver shows the updated operating expenditure updates under their main drivers.

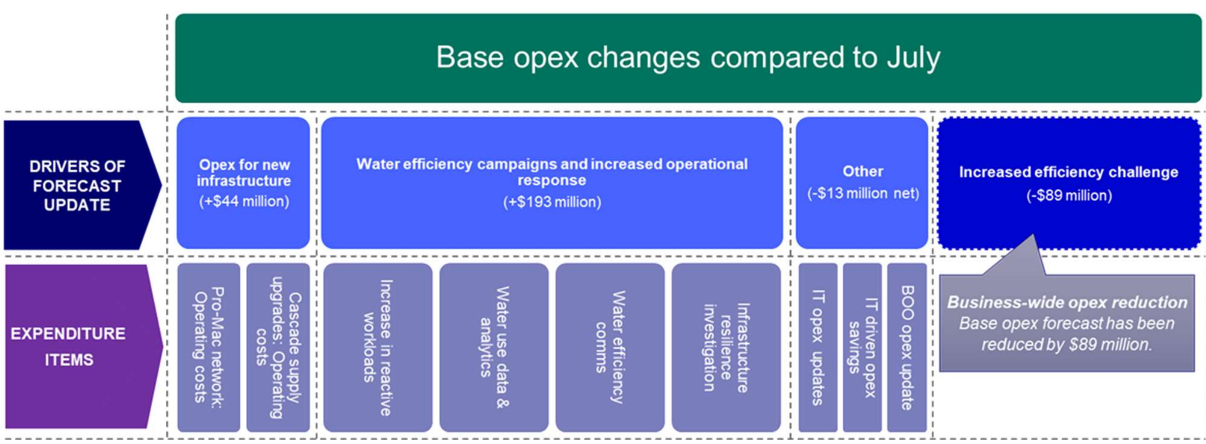


Figure 2-3 Base operating expenditure updates by driver

The annual profiles of updated operating expenditure items are shown in Table 2-4.

Table 2-4 Summary of base operating expenditure forecast changes ($2019–20 million)

Operating expenditure		2020–21	2021–22	2022–23	2023–24	2020-24
Water supply resilience infrastructure	Prospect - Macarthur link		10	14	15	**39**
	Cascade supply upgrades		1	2	2	**5**
Enduring water efficiency and operational responses	Water Reactive	26	26	24	22	**98**
	Wastewater Reactive	9	9	7	6	**31**
	Water efficiency communications	10	10	10	10	**40**
	Water use data & analytics	4	4	4	4	**16**
	Infrastructure resilience investigation	2	2	2	2	**8**
Other drivers	IT operating expenditure	-3	2	0	-1	**-1.5**
	IT driven operating expenditure savings	-	-1.8	-9.2	-11.9	**-23**
	BOO plant changes	3.1	3	2.9	2.9	**11.9**
Efficiency challenge	Business-wide efficiency gain	-5.1	-15.7	-26.1	-42.0	-88.9
	Annual totals	**46**	**50**	**30**	**9**	**135**

2.1.3 Pass-through expenditures

The triggers identified for pass-through expenditure items include:

- government decisions
- water restrictions being put in place
- dam levels.

Given the uncertainty about their occurrence and timing, it is not appropriate to add these items to our base forecasts.

We propose a single capital expenditure item under the cost pass-through framework – upgrades to our water network if the Sydney Desalination Plant (SDP) is expanded. The total capital expenditure forecast for this is $368 million over 2020–24.[15] It would also result in a small amount of additional operating costs, see section 2.3.1.

[15] An additional $68 million is expected in 2019-20 – this represents planning and design costs which we consider prudent given the possibility that the expenditure could be triggered very soon.

A range of operating costs could be incurred over 2020–24 via the cost pass-through framework, totalling up to $347 million. The actual amount will depend on the combination and timing of the various trigger events.

Figure 2-4 presents the possible expenditures categorised by driver.

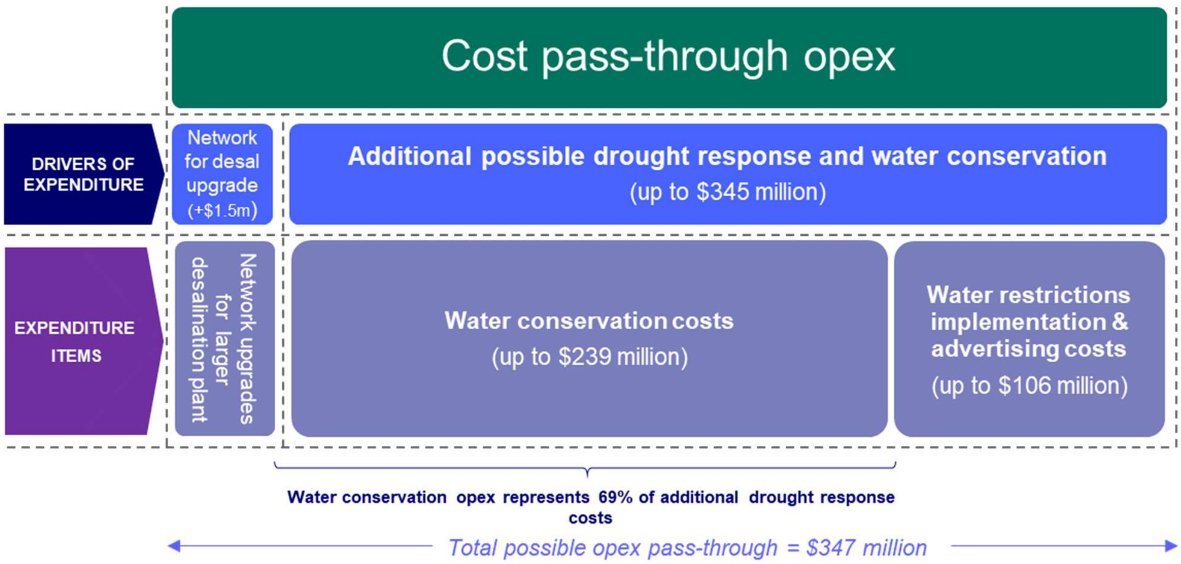


Figure 2-4 Cost pass-through operating expenditure updates by driver

The vast majority is due to much more water conservation activity which will be triggered if dam levels are low. Table 2-5 profiles the potential operating expenditure items.

Table 2-5 Possible cost pass-through operating expenditure forecast ($2019–20 million)

Operating expenditure		2020–21	2021–22	2022–23	2023–24	2020–24 Total
Supply resilience infrastructure	Network upgrades for an expanded SDP		0.5	0.5	0.5	1.5
Non-infrastructure, drought-related	Water conservation	51	63	63	63	239
	Water restrictions advertising	10	10	10	10	40
	Water restrictions implementation	15	15	15	15	60
	Drought management	2	2	2	2	6
	Annual totals	78	90	90	90	347

This shows the pass-through amounts for all items being triggered from 2020–21.

2.2 Base expenditures in detail

2.2.1 Context on the current drought

Conditions are severe

Total dam levels below 50%

Dam levels are dropping faster than ever - from 90 percent capacity to 50 percent in approximately two years.

Record low inflows into catchments

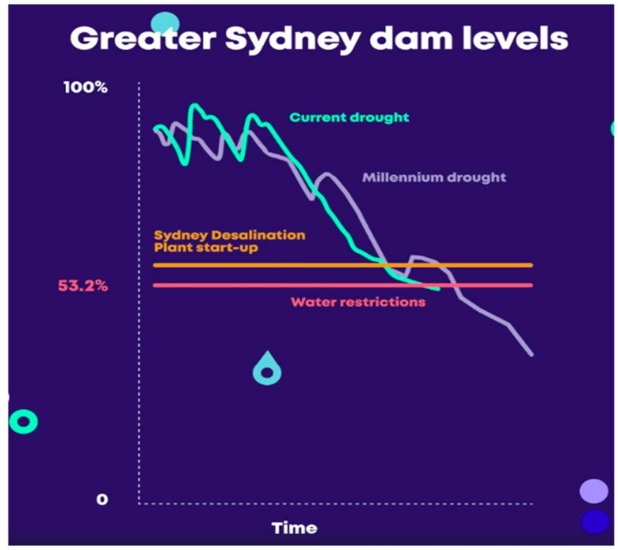
The last two years have seen some of the lowest inflows into catchment dams since the early 1940's.

Hotter and drier weather

Hot temperatures mean catchments are much dryer than usual, which reduces runoff from the land

Drought conditions likely to continue

The Bureau of Meteorology's (BOM) climate forecast indicates no foreseeable signs of reprieve from current drought conditions.



Graph: Dam depletion for current vs millennium drought - June 2019

Greater Sydney's total water storage is currently at 47.2% of full capacity,[16] with 33% being the lowest level recorded since Warragamba Dam was built. Even after some demand reduction due to Level 1 restrictions, storage depletion rates are the fastest on record. If these continue, total storage could reduce to 35% of capacity by July 2020.

2.2.2 Risks to the Illawarra and Macarthur

The current drought is impacting all three Greater Sydney supply catchments (Warragamba, Shoalhaven and Illawarra). The 'southern dams' supplying over 200,000 customers in Illawarra and Macarthur are smaller and deplete faster.

The southern dams are the only source of water for the Macarthur delivery system. The Illawarra system is even further constrained and can only draw water from the shared Avon and Nepean dams. The Avon dam water has been largely reserved for the Illawarra system to manage the risk of earlier loss of supply to that system.

Even if a total depletion of storage does not eventuate, very low dam storages create a higher risk of algal blooms and can lead to poor quality water inflows to filtration plants. We have not operated our system below 30% previously and it is likely that hydraulic and water quality constraints will need to be managed.

[16] WaterNSW, *Greater Sydney water supply and storage report*, Weekly edition, 7 November 2019.

If no further action is taken, Illawarra and Macarthur residents are at greater risk of loss of supply and other localised impacts than parts of Sydney supplied from the Prospect system.

2.2.3 Drought response and increasing system resilience

The 2017 Metropolitan Water Plan (MWP) included a framework for:

- a flexible drought response strategy
- mitigation strategies for identified risks to water security.

Our 2019–23 Operating Licence requires us to implement any action we are responsible for under the 2017 MWP.[17]

The box to the right shows drought responses set out in the MWP and the corresponding dam storage triggers.

MWP drought response triggers

Restrictions	Measures commence	Total dam storage	Measures off	
Water Wise Rules		100%		
Water Wise Rules		95%		
Water Wise Rules		90%		
Water Wise Rules		85%		
Water Wise Rules		80%	Shoalhaven transfers	
Water Wise Rules	Shoalhaven transfers	75%		
Water Wise Rules		70%	Sydney Desalination Plant*	
Water Wise Rules		65%		Water Restrictions eased as dam levels rise†
Water Wise Rules	Sydney Desalination Plant start-up Investigation into contingent drought supply	60%		Water Restrictions eased as dam levels rise†
Water Wise Rules		55%		Water Restrictions eased as dam levels rise†
Level 1 Water Restrictions	Sydney Desalination Plant Stage 2 preliminary planning	50%		Water Restrictions eased as dam levels rise†
Level 1 Water Restrictions	Sydney Desalination Plant Stage 2 detailed planning	45%		Water Restrictions eased as dam levels rise†
Level 2 Water Restrictions		40%		Water Restrictions eased as dam levels rise†
Level 2 Water Restrictions	Sydney Desalination Plant Stage 2 construction	35%		Water Restrictions eased as dam levels rise†
Level 3 Water Restrictions	Reduce environmental flows* Increase transfers from Tallowa Dam*	30%		Water Restrictions eased as dam levels rise†
Level 3 Water Restrictions	Planning and construction of new drought supply*	25%		Water Restrictions eased as dam levels rise†

Drought supply options study

The MWP required that we and WaterNSW undertake a drought supply options study when total dam storages reached 60%, to investigate the most suitable response measures in the event of an extreme drought.

Given the steep decline of dam storage levels, the study was started before dam levels reached 60%. As the Greater Sydney system consists of nine 'supply nodes' we also considered responses to drought impacts locally.[18] The Illawarra and Macarthur example above exemplifies the need for this.

The study considered a large number of options to minimise drought impacts on customers, reduce emergency infrastructure investment and improve network resilience. It assessed options based on cost, timing and impact on supply and resilience. Options were not limited to those which augment the water supply. Other drought responses included:

- managing demand
- changing how we operate our network
- building resilience to make the most of current supplies.

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[17] *Sydney Water 2019–23 Operating Licence*, clause 3.2.4. Previously, we did not have a regulatory requirement to implement specific actions under the Plan.

[18] Even if Greater Sydney's total dam storage was at a level which did not trigger the more significant actions identified in the MWP, very low local storage levels could have serious impacts at a supply node.

The study was submitted to the NSW Government in January 2019, laying out infrastructure options for the government to consider. It identified two options which could mitigate particular local drought risks while also improving system resilience in the longer term:

- Prospect to Macarthur water link
- the Cascade system resilience upgrade.

2.2.4 Water supply security and resilience updates

Prospect to Macarthur link

<table>
<tr><th colspan="5">Expenditure Summary</th></tr>
<tr><td>Driver of expenditure</td><td colspan="4">The areas supplied by the southern dams are at risk of water supply disruption due to the ongoing drought.
The Prospect to Macarthur link will mitigate water supply risks caused by the current drought.
As it is a two-way link and provides a system balancing capability it also improves system resilience over the long term.</td></tr>
<tr><td>Scope</td><td colspan="4">The project will create a two-way link between Prospect South and Macarthur water distribution systems.
It includes water mains, pumping stations and associated infrastructure. A large proportion of the infrastructure would otherwise be required for growth in the coming years.</td></tr>
<tr><td rowspan="3">Expenditure type and cost recovery</td><td colspan="2">Type of expenditure</td><td colspan="2">Cost recovery approach(es)</td></tr>
<tr><td>Capex</td><td>Opex</td><td>Base forecast</td><td>Cost pass-through</td></tr>
<tr><td>●</td><td>●</td><td>●</td><td></td></tr>
</table>

Project need and option selection

Some dams supplying the Illawarra and Macarthur systems are already below 40%, and at current depletion rates they could be less than 30% by the end of 2019.[19] If the current drought conditions persist, a 'minimum inflow' scenario suggests that these dams could have less than three years of supply remaining.

These areas face a higher risk of water supply disruptions. At dam levels below around 30% of capacity, other risks increase as poor inflow water quality can impact the operations of filtration plants. The Prospect to Macarthur link mitigates the likelihood of possible water supply disruption (and the economic and community impacts of this). By supplying Macarthur's 'restricted' average day demand[20] from the Prospect system, the systems supplied from the southern dams will be more secure.

This option was selected because it:

[19] According to a low flow scenario by WaterNSW.

[20] This is the area's average daily demand assuming that Level 2 water restrictions are in place – this assumes 13.7% total water savings over a 12-month period compared to weather-corrected forecast demand.

- can be built in time to mitigate the risks of more extreme depletion forecasts
- increases system resilience, providing two water sources to both the Macarthur and Prospect South systems.

It also aligns with expenditure expected to be required for future growth.

Scope

The investment provides a two-way link between the Prospect South and Macarthur systems with capacity to supply up to 120 ML/day. Work on two 'fronts' will be delivered in two stages. A higher capacity link on a western route can be complete by late 2021 and the link further east is planned for late 2023. Some infrastructure in the link was already envisaged in longer term growth servicing plans.

Cost estimates and delivery

The expenditure profiles over 2020–24 are shown in Table 2-6.

Table 2-6 Prospect and Macarthur capital and operating expenditures ($2019–20 million)

Forecast expenditure	2020–21	2021–22	2022–23	2023–24	2020–24 Total
Pro Mac capital expenditure	399.5	22.8	62.0	0.0	**484.2**
Pro Mac operating expenditure	-	10	14	15	**39**

For the western link to be in place by late 2021, we are incurring capital investment in this financial year. Including the 2019–20 expenditure, the total increase to our forecast due to this investment is $561 million.[21] The bulk of capital expenditure is in 2020–21. Operating expenditure includes pumping and operational costs, increasing as the second part of the link is completed.

This investment is progressing through the usual governance gates required for an investment of this size. It is also subject to the NSW Government's Major Projects Policy and is in the early stages of the Infrastructure NSW external independent assurance process.

We expect the work to be managed and delivered by a single contractor through a project specific procurement process.

Cascade Water System upgrades

The Cascade Water Delivery System supplies water to around 27,000 customers in the Blue Mountains area. Water is sourced through a combination of the Blue Mountains dams and the Fish River scheme (including Oberon Dam). There is also a limited emergency transfer scheme which can supply some water from the Orchard Hills system to lower parts of the system.

[21] The latest forecast is for $76.7 million of capital to be incurred in the 2019-20 financial year. Note that this is the forecast increase in expenditure – our original 2020-24 capital forecast included over $100 million of growth expenditure which is expected to form part of what will become the Pro-Mac link.

Expenditure Summary				
Driver of expenditure	The Cascade water system serving the Blue Mountains does not have access to a diverse range of water sources. Some depletion forecasts suggest that water supply risks could arise in about two years. This investment mitigates supply risk to the Cascade system during the current drought. While not a direct driver, a long-term benefit is that the Blue Mountains water supply will be more secure.			
Scope	The project will progress in parallel: • Upgrading the Cascade WFP so that it can treat raw water from a new water source • A capacity increase for the emergency transfer scheme from Orchard Hills WFP.			
Expenditure type and cost recovery	**Type of expenditure**		**Cost recovery approach(es)**	
	Capex	**Opex**	**Base forecast**	**Cost pass-through**
	●	●	●	

Project need and options considered

The current drought has depleted Oberon Dam (current storage 33.1%) and some depletion scenarios show that water could run out late in 2021.[22] As part of the response, WaterNSW will transfer an alternative source (from Duckmaloi weir) to Cascade WFP. While this will provide more raw water, it is expected to be lower quality.

The lowest cost option which meets the need in time is a 'hybrid' plant and network solution:

- an upgrade at the Cascade WFP so that it can treat the Duckmaloi raw water
- targeted network upgrades to increase the capacity of the emergency transfer scheme from the Orchard Hills WFP.

This option mitigates the supply risk to the Cascade system associated with the current drought. It also provides a long-term benefit, increasing the system's resilience to future droughts and other contingency events.

Scope

The network upgrade will enable transfer of the 'restricted' average day demand from the Orchard Hills system – enough to fully supply the Cascade system for around 50% of time. This level of capability was chosen as there is a large step change in the cost above it.

Work includes upgrades to pumping stations plus targeted cross-connections of watermains at two locations. The water filtration plant upgrade will add a side stream process to allow treatment of up to 12ML/day of water from Duckmaloi. This includes new screens, chemical dosing and UV filters.

[22] The Blue Mountains dams are much smaller (with around 6% of Oberon dam's capacity). While percentage storage levels are currently higher the water volume held is much less.

Cost estimates and delivery

The expenditure profiles are shown in Table 2-7.

Table 2-7 Cascade capital and operating expenditures ($2019–20 million)

Forecast expenditure	2019-20	2020–21	2021–22	2022–23	2023–24	2020-24 Total
Cascade capital expenditure	4.7	29.1	12.0	-	-	**41.1**
Cascade operating expenditure	-	-	1	2	2	**5**

The network upgrade is planned for completion by March 2021, and the plant upgrade by around October 2021. Forecast operating expenditure increases in line with these expected completion dates.

We expect the work to be managed and delivered by a single contractor through a project specific procurement process.

The project is subject to the usual capital governance approval gates.

Increased reactive workload

It is well understood that prolonged periods of dry weather result in a reduction in soil moisture content in the deeper levels of the soil. This directly impacts the performance of our buried pipeline assets. Our reactive workload has increased significantly on water and wastewater assets and we expect this to continue.

<table>
<tr><th colspan="5">Expenditure summary</th></tr>
<tr><td>Overview of expenditure</td><td colspan="4">These changes to operating expenditure reflect higher reactive workloads which are expected to endure into the 2020-24 period.
We developed our Price Proposal assuming that conditions would moderate and workloads would drop. The opposite has occurred.</td></tr>
<tr><td rowspan="3">Expenditure type and cost recovery</td><td colspan="2">Type of expenditure</td><td colspan="2">Cost recovery approach(es)</td></tr>
<tr><td>Capex</td><td>Opex</td><td>Base forecast</td><td>Cost pass-through</td></tr>
<tr><td></td><td>●</td><td>●</td><td></td></tr>
</table>

Workloads were consistent from 2010 to 2016 as weather patterns fluctuated between wet and dry, keeping the ground surrounding pipes in steady state and leaving enough soil moisture to reduce the likelihood of tree roots entering our wastewater pipes. Since late 2016, Sydney has experienced sustained dry weather, with average daily rainfall consistently less than long-term averages and maximum daily temperatures consistently higher.

This has resulted in higher reactive workloads due to:

- repairing a much higher number of water network breaks and leaks
- clearing up and (if needed) making repairs after a much higher number of wastewater overflows, often caused by tree roots.

This workload has not decreased as we expected. Having analysed another full year of work type and cost data, we decided to amend the base operating expenditure forecast to reflect enduring higher reactive workloads.

Reactive workload increase – water

Over the last two years, the monthly number of reported water leaks has consistently remained above the median over the past twelve years. In September 2019, reported leaks were 600 higher than the long-term median. When leak reports are recorded, they remain outstanding until assessed and repaired.

The number of recorded 'leaks and breaks' on water mains peaked in 2017–18 before reducing in line with historical levels. However, since then there has been a sharp increase in leaks reported on other assets - 'main to meter' services and fittings. In simple terms, since 2017–18 the workload has remained at the higher levels but the assets impacted by leaks has changed.

In 2018–19, extra resources were allocated to leak repairs. This reduced the growing backlog of outstanding leaks at a cost of just under $19 million. Figure 2-5 shows the impact of these extra resources on a daily count of outstanding leaks.

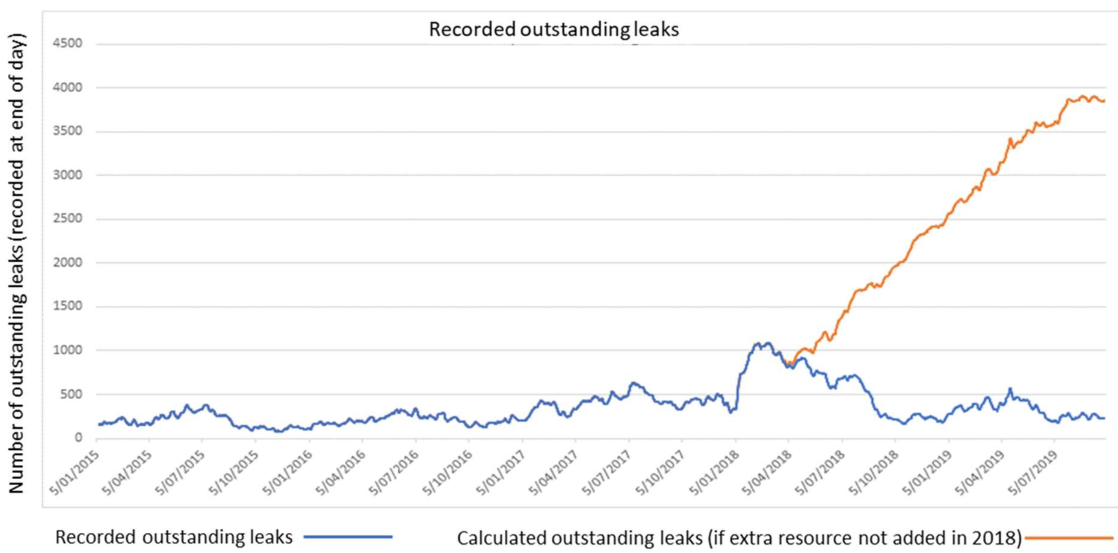


Figure 2-5 Projected number of outstanding leaks (from April 2018) compared to actuals

Without the injection of extra resources, the projected number of reactive water leaks in backlog could have been up to around 3,800. This would be unacceptable for our assets as well as for leakage performance.[23]

We expect to incur a slightly higher cost of $26 million in 2019–20 and the work is expected to continue in the coming years. The change in operating expenditure forecast for reactive work on the water network is shown in Table 2-8.

Table 2-8 Increased water reactive workload operating expenditure forecast ($2019–20 million)

Forecast expenditure	2020–21	2021–22	2022–23	2023–24	2020–24 Total
Reactive operating expenditure - water	26	26	24	22	**98**

Previous droughts have varied in length, but average duration is around five to seven years. We have now experienced a much higher workload for two years, and expect that the conditions-driven workload will stay high for at least two more years. We have then assumed a gradual drop off in expenditure in the later years, to reduce risk to customers. The assumed reduction in workload used in the forecast above follows a similar rate of decline as observed after previous droughts.

There are two sources of residual risk for us in this approach. Firstly, the Millennium drought lasted for seven years. Also, changes in conditions do not necessarily reduce workloads immediately – they can introduce conditions which lead to other asset failure modes.[24]

Reactive workload increase - wastewater

Our Price Proposal noted that dry soil conditions were driving many more wastewater chokes, with over 20,000 in 2018. This led to a higher reactive workload, for clear up and repairs after an overflow occurs.

Again, the higher level of workload experienced in 2017 and 2018 has not abated as we had assumed when developing the Proposal. Figure 2-6 shows that every month for the last two years recorded more ‘breakdown’ jobs than the twelve year monthly median.

[23] We estimate that the backlog of nearly 1,200 outstanding leaks in April 2018 corresponded to a quarterly level of leakage equivalent to 148 ML/day.

[24] For example, very dry soil can recede from buried pipework leaving gaps which can be eroded if heavy rains follow the drought. This can undermine the support around the pipes.

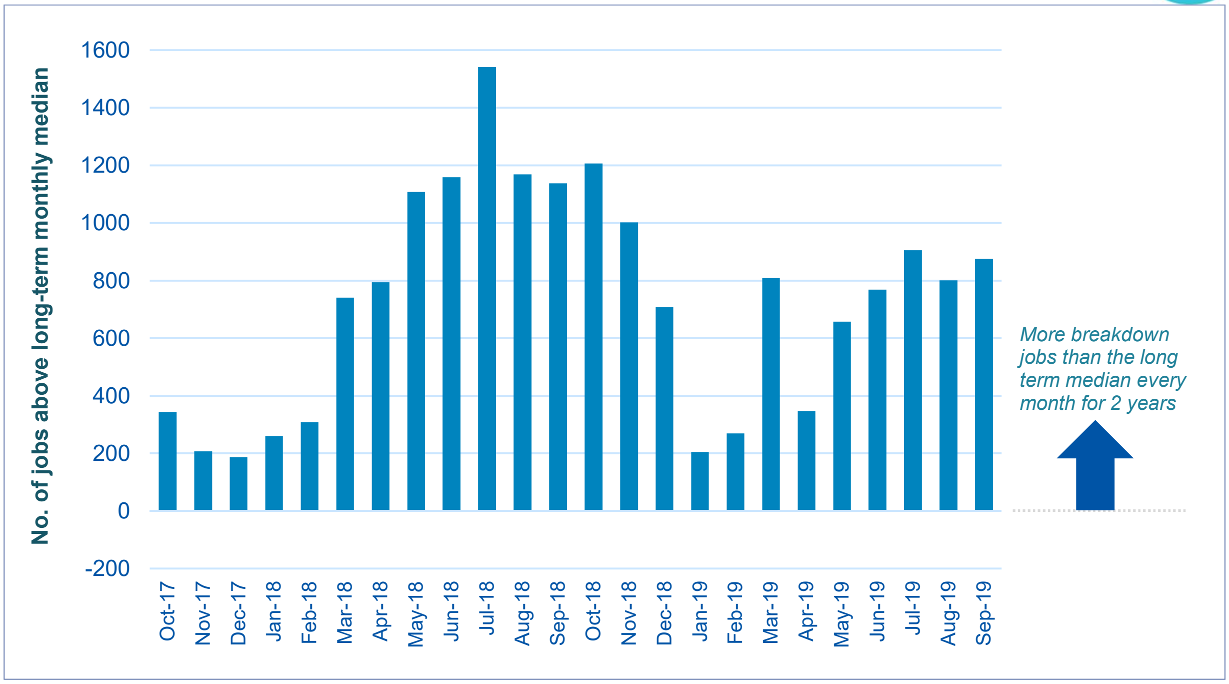


Figure 2-6 Wastewater breakdown jobs compared to long-term monthly median

In 2018–19, extra resources were allocated to this reactive work at a cost of just under $48 million. While this has had some impact, the backlog has remained well above historical norms through 2019.[25] Without the additional resources, the job rate would have been much higher.

In 2019–20 we forecast the extra cost at $9 million, and we expect the same level of work to continue in the coming years. The change in operating expenditure forecast for reactive wastewater network jobs is shown in Table 2-9.

Table 2-9 Increased wastewater reactive workload operating expenditure forecast ($2019–20 million)

Forecast expenditure	2020–21	2021–22	2022–23	2023–24	2020–24 Total
Reactive operating expenditure - wastewater	9	9	7	6	**31**

As for the ‘reactive water’ forecast, this updated forecast includes a profile of reducing workload based on previous experience at the end of drought.

Communications and advertising

As the drought has continued and intensified, we have recognised the need:

- for ongoing communications and advertising campaigns to promote water use efficiency and conservation even outside of drought

[25] Around 150 – 200 jobs outstanding compared with 10 – 60 jobs historically

- to intensify our marketing campaign for water restrictions, if targeted reductions are to be achieved.

Customer research conducted earlier in 2019 indicated that half the population of Sydney did not consider the city to be in drought. Awareness has now increased but this finding shows the need for expenditure in this area. We always need to raise awareness of efficient water use, not just during drought.

We plan two separate but related advertising operating expenditure items – one is a change to the base and the other is to be recovered under the cost pass-through framework, depending on the level of water restrictions in place.

Expenditure summary				
Overview of expenditure	Firstly, we are proposing an additional advertising cost to maintain customer and community awareness of efficient water use all the time – this will add to base operating expenditure. We intend to include additional advertising expenditure on a cost pass-through basis, during drought conditions. This will target more specific water usage reductions.			
Expenditure type and cost recovery	***Type of expenditure***		***Cost recovery approach(es)***	
	Capex	**Opex**	**Base forecast**	**Cost pass-through**
		●	●	●

The expenditure profiles are shown in Table 2-10.

Table 2-10 Operating expenditure forecasts for advertising ($2019–20 million)

Forecast expenditure	2020–21	2021–22	2022–23	2023–24	2020–24 Total
Water conservation advertising – ***base***	10	10	10	10	**40**
Water restrictions advertising – ***cost pass-through***	10	10	10	10	**40**

Water conservation communications and advertising

The base operating expenditure is to maintain a level of water efficiency awareness, even outside of drought periods. This will allow the ongoing promotion of water efficient customer behaviour. The cost forecast is based on recent annual spend for the drought advertising campaign. It covers:

- creative development and campaign production
- booking media placements
- public and community relations and social media
- developing online resources for schools, and additional branding.

It also covers continual tracking of campaign effectiveness, to inform refinement over time.

We expect these activities to endure and propose that this operating cost be added to base expenditure over 2020–24.

Water restrictions advertising (cost pass-through)

Water restrictions advertising entails specifically targeted campaigns to inform water users what different levels of restrictions mean to them and call for a reduction in water use. It will only be triggered when restrictions are mandated as dams fall to trigger levels. This cost is being incurred now and the forecast is based on current spend.

Under the pass-through mechanism, it will only be incurred and recovered from customers if the trigger is activated. We currently expect it to be incurred for at least 2020–21.

Water use data and analytics

Access to more comprehensive data and analysis is essential for ensuring that water usage insights inform the development of customer-focused water saving initiatives. We have recently increased expenditure in this area in response to the current drought. However, this capability will be beneficial on an ongoing basis, for example in considering how water use patterns impact efficient network management.

Expenditure summary				
Overview of expenditure	From 2018-19 we began to develop a more sophisticated water use analysis capability, with new data sources. These activities will continue over 2020-24 with the aim of better targeting of water saving initiatives and supporting network management.			
Expenditure type and cost recovery	***Type of expenditure***		***Cost recovery approach(es)***	
	Capex	**Opex**	**Base forecast**	**Cost pass-through**
		●	●	

Activities which will be maintained and expanded over 2020–24 include:

- extending end use customer behaviour studies supported by smart meters, to access more granular data and gain specific insights on how water is used in the home
- conducting more detailed water use surveys and purchasing external data to supplement our own data sources, enrich our analysis and better target water efficiency initiatives
- developing more sophisticated analytics capabilities including more granular leakage analysis.

All of these will inform and improve advertising campaigns, communications, restriction design, water efficiency programs and leak management. Another benefit we will target in the longer term is to leverage very detailed demand information to better understand network capacity issues. We are also looking to develop improved predictive models of customer behaviour.

The forecast operating expenditure is shown in Table 2-11.

Table 2-11 Operating expenditure forecast for water use data and analytics ($2019–20 million)

Forecast operating expenditure	2020–21	2021–22	2022–23	2023–24	2020–24 Total
Water use data and analytics	4	4	4	4	**16**

We expect that this will remain as a 'base' activity over the long term.

Infrastructure resilience investigations

Over the last two years, we have undertaken additional investigations into the resilience of our infrastructure in response to the current drought conditions. We now expect that there is a need to continue this activity going forward.

Expenditure summary				
Overview of expenditure	The current drought has required us to review the resilience of our network and consider more complex supply and demand scenarios. This is expected to continue, even after the current drought ends			
Expenditure type and cost recovery	***Type of expenditure***		***Cost recovery approach(es)***	
	Capex	**Opex**	**Base forecast**	**Cost pass-through**
		●	●	

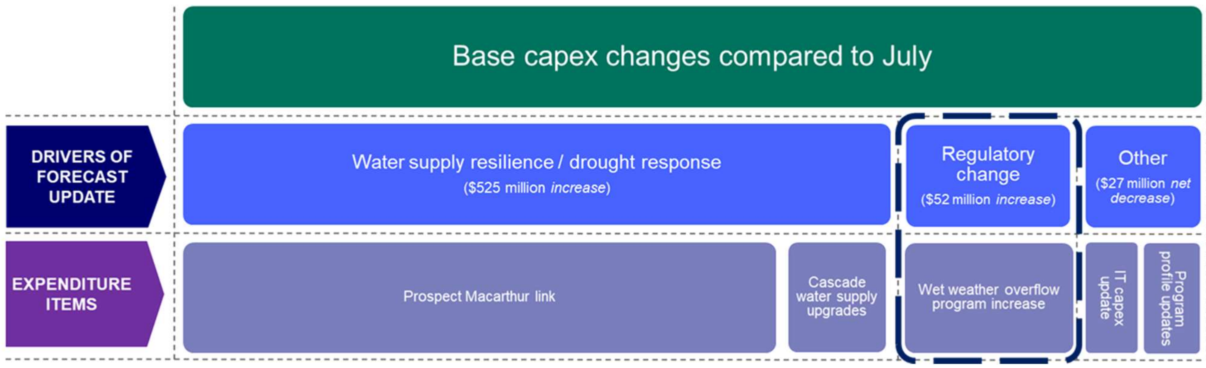
Our planning needs to consider more complex and volatile supply and demand conditions compared to the past. We therefore expect to maintain this higher level of activity in investigating the right responses to these conditions. Work is likely to include considering the integration of new supply sources, finding new ways of operating the network in the face of new risks, and working out how to make the most of existing supply sources.

The estimated ongoing cost based on recent expenditure is shown in Table 2-12.

Table 2-12 Operating expenditure for infrastructure resilience investigations ($2019–20 million)

Forecast operating expenditure	2020–21	2021–22	2022–23	2023–24	2020–24 Total
Infrastructure resilience investigations	2	2	2	2	**8**

2.2.5 Base expenditure updates – regulatory change



Wet Weather Overflow Abatement program

The Wet Weather Overflow Abatement program addresses wastewater overflows which occur in wet weather when rain inundates sewers. It was included in our Price Proposal under the New Mandatory Standards driver. To meet a higher than expected performance level, we forecast an increase to capital expenditure from $172 million to $224.1 million.

Expenditure Summary				
Driver of expenditure	The new regulation for managing wet weather overflows (via a risk-based credit approach) was finalised at a higher performance level than assumed in the Price Proposal. As more credits will need to be generated to meet the regulation, the capital costs will be higher (by $52 million).			
Scope	To generate the extra credits, additional 'source control' work will be undertaken in Prospect Creek and Middle Harbour / Mosman catchments			
Expenditure type and cost recovery	***Type of expenditure***		***Cost recovery approach(es)***	
	Capex	**Opex**	**Base forecast**	**Cost pass-through**
	●		●	

The profile of the expenditure increase is shown in Table 2-13.

Table 2-13 Wet Weather Overflow Abatement capital investment update ($2019–20 million)

Wet Weather Overflow Abatement	2020–21	2021–22	2022–23	2023–24	Total
Original Price Proposal forecast	31	32	54	55	**172**
Updated forecast	51.0	59.7	60.7	52.7	**224.1**
Difference	20.0	27.7	6.7	-2.3	**52.1**

New regulatory measure

When the forecast for our Price Proposal was being developed, the target for the new wet weather overflows regulatory measure was not yet finalised by the EPA. We knew the measure would likely change from an overflow frequency limit to a risk-based credit approach. Credits would be achieved by targeting the environmental impact of wet weather overflows, not just their frequency.[26]

The original forecast assumed that the target would be set at 40 credit points (partly as this aligned with the amount of work which we considered could be achieved over 2020–24). After the forecast was developed, the EPA determined that 60 credit points would need to be achieved over 2020–24, with the relevant Environment Protection Licences to be amended later in 2019. The EPA's rationale for the increase was perceived low levels of expenditure since 2012 and heightened community expectations. As this cannot be achieved within our original forecast, we have re-assessed the scope of work required and forecast the higher program cost.

Program scope

The original program forecast of $172 million included $141 million to achieve 40 credit points, and a further $31 million of work to comply with other EPA requirements .[27] This smaller part of the program is unaffected by the increase in credit points.

The scope of work to achieve 40 credit points included 'source control' work, on both our assets and on private assets, including:

- Stages 1 to 3 source control in three catchments (Lane Cove, Mid Parramatta and Upper Parramatta)
- Planning and partial completion of Stage 1 work in the Prospect Creek catchment
- Planning for work in Middle Harbour / Mosman catchment.

[26] For example, 100 low impact overflows could have a lesser environmental impact than 50 overflows at more sensitive locations.
[27] This includes work to meet EPA Pollution Reduction Program orders on non-compliant wastewater systems and to continue the Wet Weather Overflow monitoring program

What is ‘source control’?

Source control is not a discretionary activity. It is a novel and efficient approach to reducing wet weather wastewater overflows in targeted catchments by reducing inflow and infiltration – *initially* from our own assets, *and then* by addressing infiltration from private plumbing. The three stages of source control are:

- **Stage 1: Inflow control** – reducing direct inflow to the wastewater system by improving surface openings on our assets, for example, maintenance hole covers and emergency relief structures
- **Stage 2: Infiltration reduction** – reducing ingress of groundwater into the wastewater system by fixing cracks and joints in large diameter wastewater pipes
- **Stage 3: Private properties** – smoke testing and asset inspection on private properties to identify sources of inflow and infiltration to the wastewater system. If required, we then fix faulty pipes or cross-connections to remove the inflow and infiltration.

We apply these approaches sequentially, as complexity and cost increases through the stages.

Why undertake ‘source control’?

It is a lower cost, lower community impact alternative to the construction of large volume wet weather storages and wastewater network augmentation. Other benefits include:

- avoiding land purchases, long lead times, planning approvals and construction impact for large footprint storage assets
- no risk of stranded storage assets
- avoiding operating and maintenance costs for intermittently used storage assets
- reduced flow in the wastewater system = less flow to treat at the plants.

Customer consultation

We engaged with customers to better understand their views in relation to us funding source control work on private assets, as a lower cost solution than amplification of our own assets. This would deliver lower bills for all customers, assuming regulatory treatment of this expenditure as capital expenditure. Customers were supportive of this approach.

The additional work to create 20 further credit points is expected at Prospect Creek and Middle Harbour / Mosman catchments. Table 2-14 shows the scope of the ‘40 point’ and ‘60 point’ program.

Table 2-14 Comparison of 40 credit point vs 60 credit point programs

Key	
40 points program scope	✓
60 points program scope	+20

Catchment	Stages included in 2020-24 Scope			
	Planning	Stage 1	Stage 2	Stage 3
Lane Cove	*Completed before 2020*	✓	✓	✓
Mid Parramatta	*Completed before 2020*	✓	✓	✓
Upper Parramatta	*Completed before 2020*	✓	✓	✓
Prospect Creek *	✓	✓ +20	+20	+20
Middle Harbour / Mosman	✓	+20	-	-
Wolli Creek	*Completed before 2020*	*Completed before 2020*	-	-

* The original 40 credit points program assumed Stage 1 work at Prospect Creek would be started but not completed.

Updated forecast and delivery considerations

The additional cost to generate a further 20 credit points has been forecast to be $52.1 million, based on recent source control works in the Wolli Creek catchment. Table 2-15 details the change.

Table 2-15 Breakdown of increase in capital expenditure forecast ($2019–20 million)

Wet Weather Overflow Abatement	Original forecast (40 points)	Updated forecast (60 points)
Source control scope (40 points)	141.3	141.3
Other program scope **-** for PRPs and pollution study	30.7	30.7
Additional source control scope (+20 points)	-	52.1
Total	**172**	**224.1**

We are considering the best way to deliver the increased source control work scope. Specific challenges in appropriately resourcing the program include that:

- it requires a high volume of smaller jobs to be completed, often in parallel, and we will need to procure enough adequately skilled teams from a competitive market

- some of the work will take place in more remote bushland and environmentally sensitive locations
- there is a need for effective community liaison across wide catchment areas.

In this environment it is expected that unit costs may be elevated compared to normal market conditions. As noted in our Proposal, there is a planned changeover to the 'P4S' procurement model and we will need to consider this when planning the work.

2.2.6 Other base expenditure updates

Digital Business (IT) expenditure update

Forecasting capital and operating expenditure for IT needs to account for an inherently dynamic environment where technology capabilities and risks change quickly. Since the original forecasts for the Price Proposal were finalised in February 2019, they have been reviewed and updated.

Summary				
Driver of expenditure	Further consideration of the digital servicing strategy led to a change in costs and a different split between capital and operating expenditure.			
Scope	There are a range of changes, including: • a capital expenditure reduction due to the Government Data Centre move • acceleration of the cyber security program.			
Expenditure type and cost recovery	***Type of expenditure***		***Cost recovery approach(es)***	
	Capex	**Opex**	**Base**	**Cost pass-through**
	●	●	●	

We are now proposing:

- an IT capital expenditure forecast for 2020–24 which is around seven per cent lower than the original forecast
- an IT operating expenditure forecast for 2020–24 which is very slightly lower
- a reduction of $23 million to our enterprise-wide 'core' operating expenditure, to incorporate updated expenditure and benefits from our Business Experience Program (BxP).[28]

[28] The Business Experience Program envisages the implementation of what is commonly known as an Enterprise Resource Platform (ERP).

2016–20 actual and forecast digital capital expenditure changes

In updating capital expenditure with actual 2018–19 values, we also re-assessed the 2019–20 forecast. Table 2-16 shows the resulting 2016–20 capital expenditure forecast, which is $5.6 million lower than in our Proposal.

Table 2-16 Original and updated IT capital expenditure forecasts 2016–20 ($2019–20 million)

IT capital expenditure	2016–17	2017–18	2018–19	2019–20	Total*
Original Price Proposal forecast	74.4	117.2	125.7	93.9	**411.4**
Updated forecast	74.4	117.2	107.5	106.5	**405.8**

*Line items may not exactly reflect the totals due to rounding

These values have been provided to IPART in the updated AIR/SIR[29]

As foreshadowed in our Proposal, some of the initial work on the BxP project did not add to our productive capital base. Our latest assessment is that the value of a possible write-off is $14.7 million for BxP, with a profile shown in Table 2-17.[30]

Table 2-17 Possible 2016-20 capital expenditure write-off ($2019–20 million)

Possible value adjustment	2016–17	2017–18	2018–19	2019–20	Total
BxP write-off		-10.4	-4.3		**-14.7**

Updated 2020–24 IT capital expenditure forecast

The updated forecast for IT capital expenditure for 2020–24 is $347.8 million, $26.9 million lower than the original $374.7 million in the July Proposal.

Table 2-18 Original and updated IT capital expenditure forecasts 2020-24 ($2019–20 million)

IT capital expenditure	2020–21	2021–22	2022–23	2023–24	Total*
Original Price Proposal forecast	125.7	102.7	77	69.3	**374.7**
Updated forecast	119.7	89.8	79	59.2	**347.8**
Difference	-6.0	-12.9	2.0	-10.1	**-26.9**

*Line items may not exactly reflect the totals due to rounding

29 SWC limited AIR SIR for 12 Nov 2019 update to price proposal submission.

30 This value was presented during the recent interview stage of the Efficiency Review, with the appointed Efficiency Reviewers and IPART representatives in attendance. For avoidance of doubt, the AIR/SIR submitted to IPART does not include the impact of a write-off.

The major changes between the Proposal and the updated forecast by portfolio are:

- Foundation and Connectivity Systems is $31.7 million less, largely as the migration to the GovDC data centres leads to $28.2 million of avoided costs
- Systems of Record is $18.6 million higher, due to deferral of 2019–20 BxP expenditure
- Systems of Differentiation is $13.9 million less, due to acceleration of the Manage and Protect Cyber program (as shown above with higher amount in 2019–20).

Updated 2020-24 IT operating expenditure forecast

The updated digital operating expenditure forecast of $485.7 million is $1.5 million lower than our original forecast, as shown in Table 2-19.

Table 2-19 Original and updated IT operating expenditure forecasts 2020–24 ($2019–20 million)

Digital Business operating expenditure	2020–21	2021–22	2022–23	2023–24	Total*
Original Price Proposal forecast	119.6	121.2	122.5	123.8	**487.2**
IT operating expenditure reduction	-2.6	2.2	0.2	-0.9	**-1.5**
Updated IT operating expenditure forecast	117	123.4	122.7	122.9	**485.7**

*Line items may not exactly reflect the totals due to rounding

This small net change is the impact of additional CxP efficiency savings of $13.6 million and additional BxP operating costs of $12.1 million. Both these were not yet fully understood when the original forecast was developed.

When the benefits of the BxP program were re-assessed a further $23 million reduction in business-wide 'core' operating expenditure was calculated. The profile of these savings is shown in Table 2-20.

Table 2-20 Business-wide BxP operating expenditure savings ($2019–20 million)

BxP benefits	2020–21	2021–22	2022–23	2023–24	Total*
BxP benefits – operating expenditure reduction	-	-1.8	-9.2	-11.9	**-23.0**

*Line items may not exactly reflect the totals due to rounding

Business-wide efficiency improvement

As a consequence of proposing the cost pass-through mechanism for uncertain costs, we are able to set a more ambitious efficiency target on our core operating expenditure. We have therefore included an efficiency reduction of $88.9 million in our overall operating expenditure forecast (already shown in Table 2-3). This is in addition to $104 million of efficiency savings included in our original forecast. The annual profile of this is shown in Table 2-21.

Table 2-21 Business-wide efficiency savings on 2020-24 operating expenditure ($2019–20 million)

Business-wide savings	2020–21	2021–22	2022–23	2023–24	Total*
Annual efficiency savings	-5.1	-15.7	-26.1	-42.0	**-88.9**

BOO plant operating expenditure update

Expenditure summary				
Driver of update	Forecast expenditure for Build Own Operate (BOO) treatment plants has been revised as it was inadvertently understated in our Price Proposal.			
Expenditure type and cost recovery	***Type of expenditure***		***Cost recovery approach(es)***	
	Capex	**Opex**	**Base forecast**	**Cost pass-through**
		●	●	

We have revised the forecast operating expenditure for the Build Own Operate (BOO) treatment plants (as shown in Table 2-22).

Table 2-22 Revised BOO operating expenditure forecasts 2020–24 ($2019–20 million)

BOO operating expenditure	2020–21	2021–22	2022–23	2023–24	Total*
Original BOO operating expenditure forecast	97.9	98.7	98.9	99.5	**395**
Updated BOO operating expenditure forecast	101.0	101.7	101.8	102.4	**406.9**
Difference	3.1	3	2.9	2.9	**11.9**

In our Proposal we inadvertently understated the operating expenditure for Prospect Water Filtration Plant by about $3 million a year. This was because of a difference between the BOO operating expenditure allowance (from the 2016 Determination) and the internal accounting treatment of these costs. The lower ‘accounting’ operating costs were mistakenly used for our Proposal, with no adjustment to the determined Regulatory Asset Base (RAB) for finance lease assets. This updated forecast now aligns the forecast BOO operating expenditure (for Prospect) with the 2016 Determination so an adjustment to the determined RAB is not needed.

Deep Ocean Outfall project re-profiling

As noted in our Price Proposal, we intended to provide IPART with a more accurate profile for Deep Ocean Outfall (DOOF) project capital expenditure (as shown in Table 2-23). There is no net change in the forecast capital expenditure.

Table 2-23 Original and updated capital expenditure profiles for DOOF ($2019–20 million)

DOOF capital expenditure profile	2020–21	2021–22	2022–23	2023–24	Total
Original Price Proposal forecast	-	-	71.5	71.5	**143**
Updated forecast	2.0	28.6	50.2	62.3	**143**
Difference	2.0	28.6	-21.3	-9.2	**0**

Critical sewers capital expenditure revision and re-profiling

As noted in our Proposal, we intended to provide IPART with a more accurate profile for the Critical Sewers capital expenditure program.[31] This updated profile (Table 2-24) will more accurately reflect the work required for the program component focused on improving dry weather wastewater overflow performance. There is no net change in the forecast capital expenditure.

Table 2-24 Original and updated capital expenditure profiles for Critical Sewers ($2019–20 million)

Critical sewers capital expenditure profile	2020–21	2021–22	2022–23	2023–24	Total
Original Price Proposal forecast	59.3	78.2	219.0	215.8	**572.2**
Re-profiled forecast	135.0	159.0	141.0	137.2	**572.2**
Difference	75.7	80.8	-78	-78.6	**0**

2.3 Cost pass-through expenditures in detail

We outline infrastructure related cost pass-through expenditures first, followed by drought-driven operating costs to be passed through at different dam levels.

2.3.1 Sydney Desalination Plant expansion - network upgrade

These costs will only be passed through to customers if the NSW Government decides to expand the plant.

[31] Price proposal 2020–24, Attachment 9: Capital expenditure, Table 2-8, page 73.

Expenditure Summary				
Driver of expenditure	Increasing the delivery capacity of the Sydney Desalination Plant will require augmentation of our network to allow the additional water to be distributed.			
Scope	The network augmentation is expected to include additional pumping capacity, a new reservoir and replacement of a large transfer main. This will allow water which cannot be consumed in the Potts Hill system, to be transferred to the much larger (but more elevated) Prospect system.			
Expenditure type and cost recovery	**Type of expenditure**		**Cost recovery approach(es)**	
	Capex	**Opex**	**Base forecast**	**Cost pass-through**
	●	●		●

Project need and investment trigger

Preliminary planning is underway to investigate expanding the Sydney Desalination Plant in line with the requirements of the MWP. Further response thresholds from the MWP are shown in Figure 2-7, with the addition of the recent verified storage level of 47.2%.[32]

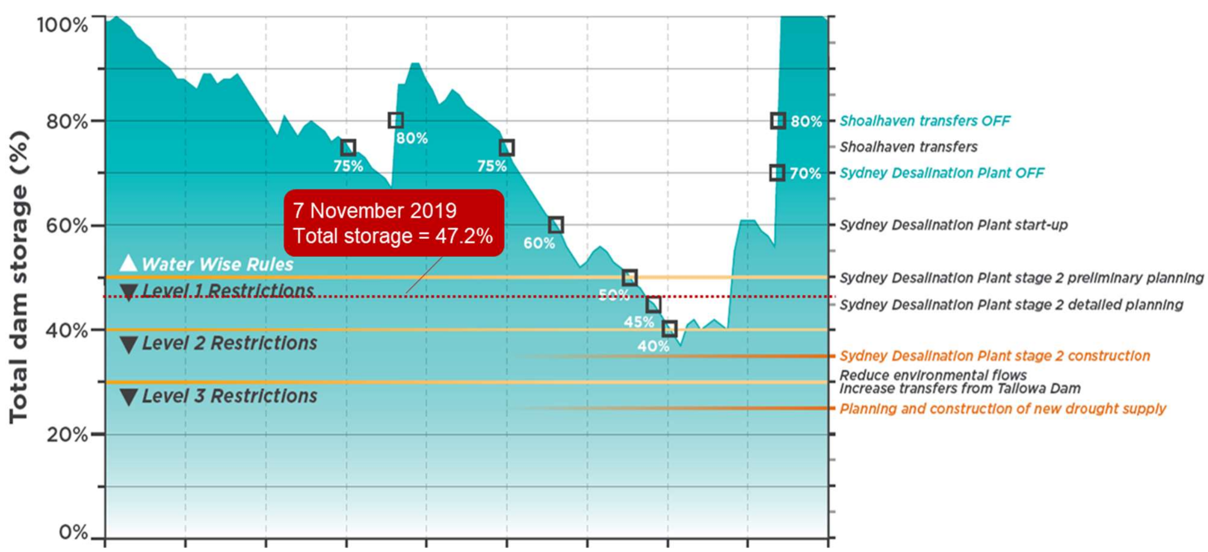


Figure 2-7 Response triggers from the 2017 MWP (dam levels are illustrative)

The MWP requires construction of the expanded plant to begin at 35% of dam storage capacity. However, under the plan's adaptive management approach, the Government can choose to implement measures at different times.

[32] WaterNSW, *Greater Sydney water storage and supply report*, Weekly edition, 7 November 2019.

Scope

The expansion is expected to double the plant's capacity (from 250 ML/day to 500 ML/day). Our network will need to be upgraded to manage the additional water, as the Potts Hill receiving system does not include enough demand. In short, the water needs to be moved further 'upstream' so that it can be distributed to more customers. This requires investment in pumping capacity of 300 ML per day, a new reservoir with 50 ML of storage and replacement of a large diameter transfer main.

Cost estimates and delivery

The expenditure profiles are shown in Table 2-25.

Table 2-25 Sydney Desalination Plant expansion - Network upgrade capital and operating expenditures ($2019–20 million)

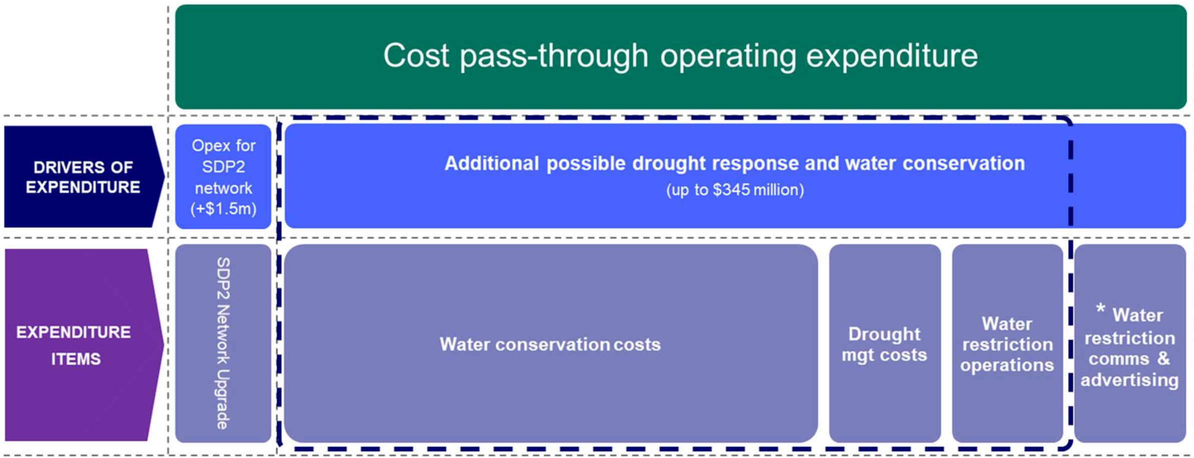
Forecast expenditure	2020–21	2021–22	2022–23	2023–24	2020-24 Total
SDP expansion Network Upgrade capital expenditure	220.8	147.2	0.0	0.0	368.0
SDP expansion Network Upgrade operating expenditure		0.5	0.5	0.5	1.5

The total capital cost is forecast at $436 million, with some early planning costs being incurred now. The operating expenditure will only be incurred when the assets are operating.

This investment will progress through the usual governance gates required for an investment of this size. It will also be subject to the NSW Government's Major Projects Policy and will follow the Infrastructure NSW external independent assurance process.

> The capital expenditure forecast of $436 million for the Sydney Desalination Plant expansion network upgrade is considered a low case estimate. It is subject to further work to assess the impacts of introducing larger volumes of water into our network, especially as it was not originally designed for this direction of water flow.

2.3.2 Drought related, non-infrastructure pass-through expenditure



* Additional advertising required during higher level water restrictions is covered in the earlier section **Water restrictions advertising –** cost pass-through, alongside the base advertising and communications operating expenditure.

Water conservation costs

Under our 2019–23 Operating Licence, we are required to implement water conservation measures that are economic.[33] The amount of activity we will undertake in the period is uncertain as it depends on the value of water, which in turn is related to dam storage levels.

<table>
<tr><th colspan="5">Expenditure summary</th></tr>
<tr><td>Overview of expenditure</td><td colspan="4">Operating expenditure up to a maximum of $239 million for a range of water conservation activities which are:
• over and above the base program presented in our Price Proposal
• dependent on the value of water.</td></tr>
<tr><td rowspan="3">Expenditure type and cost recovery</td><td colspan="2">Type of expenditure</td><td colspan="2">Cost recovery approach(es)</td></tr>
<tr><td>Capex</td><td>Opex</td><td>Base forecast</td><td>Cost pass-through</td></tr>
<tr><td></td><td>●</td><td></td><td>●</td></tr>
</table>

Context

We currently use the Economic Level of Water Conservation (ELWC) methodology to assess water conservation measures to be included in our Water Conservation Program. As dam levels fall, the value of water as calculated by ELWC increases, meaning additional water conservation becomes beneficial for society.

[33] Sydney Water 2019-2023 Operating Licence, clause 3.1.2. We must implement water conservation measures assessed as economic using the Economic Level of Water Conservation (ELWC) method. An explanation of the ELWC method is available on our website. The methodology was approved by IPART in December 2016.

Our Proposal included operating expenditure of $10 million per year over 2020–24 for a base Water Conservation Program to run at all dam levels. This program included a range of demand management programs for different customer sectors, leak management, and ongoing research and development to identify new water conservation measures.

Additional activities

The potential operating expenditure presented here is in addition to the base program, and would fund the additional activity required as dam levels fall (and the value of water increases).

A larger water conservation program is likely to be achieved by expanding base programs to reach more participants and increasing our proactive leak management. However, water conservation options will continue to be assessed regularly to ensure we deliver the most effective and efficient range of measures. The evolving program will also be influenced by the outcomes of our ongoing research and pilot programs.

Potential pass-through costs are based on estimated levels of activity if we reach lower dam levels (see Appendix 1 for more detail). Based on a comparison of comparable companies, we consider our packages are reasonable.

We are already spending above base levels, as we ramp up water conservation in response to drought and we expect some increased activity, particularly at the start of the regulatory period. Depending upon dam levels, we propose to pass through up to $63 million a year over 2020-24 (see Table 2-26).

Table 2-26 Operating expenditure forecast for water conservation activities ($2019–20 million)

Operating expenditure	2020–21	2021–22	2022–23	2023–24	2020-24 Total
Water conservation operating costs	51	63	63	63	239

The pass-through costs in Table 2-26 are based on a scenario of possible changes in dam levels.

In practice, under our new Operating Licence we will be required to implement all economic measures at any dam level. Our expenditure is therefore likely to continue above the base program allowance of $10 million a year even if dam levels recover to more than 50% during 2020–24.

Water restrictions implementation and drought management costs

Two further operating expenditure items related to implementing water restrictions will be incurred during 2020-24 if water restriction levels are in place.

Expenditure summary				
Overview of expenditure	Operating expenditure up to a combined maximum of $66 million for: • implementing higher levels of water restrictions including patrols and enforcement, administration and water use planning with large users • drought management costs to cover overall coordination of drought response activities and liaison with other entities.			
Expenditure type and cost recovery	**Type of expenditure**		**Cost recovery approach(es)**	
	Capex	**Opex**	**Base forecast**	**Cost pass-through**
		●		●

Water restrictions implementation

As water restriction levels increase, we will need to increase the number of Community Water Officers and provide vehicles for patrols. We will ramp up a range of activities including:

- restrictions administration: with tasks covering call handling and exemption processing
- enforcement: with increases in legal costs and activities to investigate water theft
- large customer liaison and water planning: analysts will work with larger water users to help them plan to optimise water use under more strict restrictions

The forecast in Table 2-27 is based upon recent costs for similar activities.

Table 2-27 Operating expenditure forecast for water restrictions implementation ($2019–20 million)

Forecast operating expenditure	2020–21	2021–22	2022–23	2023–24	2020-24 Total
Water restrictions implementation	15	15	15	15	60

Drought management

With the increase in scale and scope of drought response activities, there will need to be a small increase in management costs to ensure that:

- activities undertaken in different parts of the organisation are well coordinated and efficiently executed
- there is effective liaison with other agencies and government departments.

Additional costs will cover drought response program management, communications and stakeholder engagement and if required expert technical, legal and other advice.

The forecast in Table 2-28 is based upon recent costs for similar activities.

Table 2-28 Operating expenditure forecast for drought management ($2019–20 million)

Forecast operating expenditure	2020–21	2021–22	2022–23	2023–24	2020-24 Total
Drought management	1.5	1.5	1.5	1.5	6

3 Managing drought risks

Key messages

- In addition to our base expenditure plan, we may need to recover $670 to $800 million in uncontrollable drought costs. We may also need to recover in the order of $1.5 billion to make good revenue we do not recover if water use falls significantly below normal levels due to restrictions.
- While water sales can drop significantly during drought, our costs tend to remain the same or increase. Without some downside protection of our revenue, this scenario could place pressure on our cash flows and our ability to fund the delivery of our core services.
- We propose a cost pass-through mechanism to recover some of our drought response costs. This is similar to how IPART passes through the costs of operating the desalination plant to Sydney Water, which are then passed on to customer bills.
- Drought response costs will only be passed through to customer bills for a defined set of activities once a defined trigger is met, such as the government announcing restrictions.
- We propose an annual adjustment to prices for under-recovered revenue using a new demand revenue adjustment mechanism, to apply in times of water restrictions. The revenue mechanism is a variation to IPART's existing demand volatility adjustment mechanism.
- This does not generate additional revenue – rather, it restores revenue we ought to receive, but are losing due to drought. The inclusion of a one-year lag in the pass-through, and the materiality threshold of 5% variance, retains a portion of the risk with us, rather than passing the entire risk onto customers.
- We consider our mechanisms satisfy IPART's criteria. The revenue mechanism maintains the incentives of the existing demand volatility adjustment mechanism, ensuring customers do not bear any more risk than they should.
- For cost and bill certainty, we propose the cost pass-through and revenue recovery should apply to water service charges.

3.1 The financial impact of drought

In light of extended drought conditions and the scale of our costs to respond, we will require a greater contribution from our customers. We propose to use existing IPART mechanisms to recover costs and revenue shortfalls within the regulatory period through water service charges. This approach is in line with the application of existing Shoalhaven transfer cost and Sydney Desalination Plant (SDP) cost pass-through mechanisms.

We can no longer exclude the impacts of drought from prices in 2020–24. To do so would put our ability to fund the delivery of our core services at risk. We have applied the tests that IPART applies when making such assessments and outline the analysis and results in Chapter 7.

The magnitude of the contribution we are seeking from our customers will vary depending on the length and severity of the drought, and the timing of government decisions. We are planning for $670 to $800 million of uncontrollable drought related costs. In addition, we may need to recover about $1.5 billion through bills to make up for an equivalent amount of revenue that we may not recover as a result of much lower water consumption than usual.

The NSW Government makes decisions on when water restrictions will apply,[34] and options to manage drought. We do not control the decisions that mean we need to incur these costs; nor do we control the targets to reduce water demand that restrictions are designed to achieve.

3.2 Pass-through mechanisms

IPART have established criteria for applying pass-through mechanisms.[35] The criteria include:

- **Trigger —** there is a trigger event (to activate the cost pass-through or revenue recovery), which can be clearly defined and identified in the price determination
- **Ex ante efficiency assessment and separability —** the efficient cost associated with the trigger event can be fully assessed, including whether there are other factors that fully or partially offset the direct expenditure associated with the event
- **Materiality —** the pass-through must exceed a materiality threshold[36]
- **Controllability —** the regulated business cannot influence the likelihood of the trigger event or the resulting expenditure need
- **Symmetric —** the mechanism is symmetric in that it applies equally to both cost increases and cost decreases (in cases where the risk can result in both cost increases and cost decreases)
- **Impact —** it is clear the pass-through will result in prices that better reflect the efficient cost.

We outline our mechanisms and assess them against IPART's criteria below.

3.2.1 Cost pass-through mechanism

The costs that we propose to recover within the determination, and their triggers, include:

- Sydney Water drought related operating costs, including water restrictions, additional advertising and water efficiency campaigns and drought management — triggered by a government notice to apply water restrictions

[34] The Sydney Water Regulation 2017 allows the Minister to apply water restrictions to our area of operations, by publishing a notice in the Government Gazette.
[35] IPART, *Review of prices for Sydney Water Corporation – Final Report*, *June 2016* p. 62.
[36] The same wording was not used for the Hunter Water decision. However, the decision referred to another criterion, namely that the costs would have a *potentially material impact* on the regulated business.

- network upgrades to cater for an expanded desalination plant — triggered by a government decision to expand the desalination plant
- water conservation — triggered by dam levels falling below 50%, then 40%, then 30%.

We propose to recover costs from each customer's service charge.[37] We discuss the merits of this in section 3.2.3.

To illustrate the type of impacts this proposal may have, we present totals below assuming triggers have been reached by 1 July 2020 and persist for the remainder of the period. Table 3-1 illustrates the annual pass-through amount under each scenario, for a customer with a 20 mm water meter.

Table 3-1: Cost pass-through per 20-millimetre equivalent ($2019–20)

	2020-24 per year	Total for 2020-24
Sydney Water drought-related operating costs (including implementing restrictions, advertising and drought management)	12	**47**
Network upgrade for expansion of SDP	7	**27**
Water conservation		
50% to >40%	15	**60**
40% to >30%	23	**92**
<30%	28	**112**
Total at dam level		
50% to >40%	34	**134**
40% to >30%	42	**166**
<30%	50	**199**

The following are important considerations when analysing the cost pass-through amounts presented above:

- **Smoothed costs (where possible) to be used** to help minimise any unnecessary bill impacts from other factors such as growth in customer numbers given the assumption of constant costs per year[38]
- **Service charge increments** are subject to an ex-post true-up through an end of period adjustment to the relevant Regulatory Asset Base (RAB) or Annual Revenue Requirement
- **SDP-related network upgrades**:

[37] Revenue requirements for the costs should be calculated based on IPART's standard building block model approach.
[38] We note that smoothed costs are NPV neutral and only applied to costs which are not demand driven, that is, constant. We acknowledge that there may be a degree of over or under recovery within the period but consider these differences would not be material.

- even if required earlier, we will not pass through these costs until the trigger occurs, (that is, until there is a government decision to expand the plant).
- once triggered, the cost of upgrading our water network to cater for the expanded plant would be included in the water RAB and recovered via normal bills over the useful life of the asset

- **Operating expenditure remains in place until relevant triggers no longer apply**:
  - water conservation investment continues until dam levels rise and the value of saving water falls (as per the Economic Level of Water Conservation (ELWC) method)
  - water restriction costs are recovered until the Minister lifts water restrictions
- **We propose quarterly billing of pass-through costs**, based on the relevant forecast costs (up to IPART approved amounts).

The cost pass-through amounts in Table 3-1 represent capped bill impacts given triggers are met. Other outcomes are also possible, for example, if the trigger for the SDP network upgrade occurs later in 2020–24. Equally, if the drought abates and the Minister lifts water restrictions, this would change the value of the costs to be recovered.

To clarify the operation of the mechanism, Table 3-2 provides an example with triggers being ‘turned-off’ or ‘turned-on’, based on the following assumptions:

- 2021–22 — SDP network upgrade trigger occurs on 1 July 2021, meaning no costs are recovered from customers until 2021–22
- 2022–23 — dam levels recover (after varying between 40% to 50% for 2020–22), removing the requirement for additional pass-through expenditure on water conservation halfway through the year, resulting in only six months of cost to be recovered
- 2023–24 — water restrictions are lifted halfway through the financial year, resulting in only six months of cost to be recovered.

Table 3-2 Variations in assumed trigger events and cost pass-through amount ($2019–20 million)

	2020-21	2021-22	2022-23	2023-24
Drought-related operating costs	12	12	12	6
Water conservation	15	15	8	
Network upgrades for SDP expansion		7	7	7
Triggers		SDP ‘turned-on’ 1 Jul 21	Dam levels recover to 50% by 1 Jan 23	Water restrictions lifted, dam levels recover to 70% by 1 Jan 24
Total	**27**	**34**	**27**	**13**

Note: Drought related operating costs include implementing restrictions, advertising and drought management.

3.2.2 Proposed demand revenue adjustment mechanism

The goal of water restrictions is to help the community save water during drought, helping to slow the rate of depletion of our dams. The impact of lower water use is that water sales and revenues will be below allowable levels.[39] As a business with substantial infrastructure, we have a high level of fixed costs. The water usage price is set to signal to customers the right amount of water to use in order to delay the need for new sources of raw water. This pricing approach does not match our fixed-variable cost split. This means that the reduction in revenue due to lower water sales leaves insufficient funds to cover our base costs (that is, the costs we face regardless of whether drought occurs or not).

To be able to manage this financial impact, we propose a demand revenue adjustment mechanism (DRAM) that would allow us to recover the revenue shortfall resulting from water use below forecast. Our DRAM and the underlying methodology is a modification of the existing demand volatility adjustment mechanism (DVAM) and would apply instead of the DVAM in times of restrictions. The DRAM allows revenue recovery to occur during the regulatory period with a one-year lag. This differs from the DVAM, which under our Proposal[40] and submission to IPART's Issues Paper[41] would apply only at the end of the regulatory period and in aggregate.

For clarity, the DVAM we proposed was based on a four-year window of demand lagged by one-year relative to the regulatory period (see Table 3-3). Any revenue adjustments would be net of avoided water treatment costs (or any other relevant short-run costs). This approach would ensure that the revenue adjustment associated with the DVAM would always be based on four years of actual demand data.[42]

Table 3-3 Proposed demand volatility adjustment mechanism

	True up period 1			True up period 2				True up period 3			
Year	1	2	3	4	1	2	3	4	1	2	3
Determination Period	2016-20				2020-24[a]				2024-2028 [a]		

a - Indicative determination periods

The DVAM was originally designed as a demand forecasting incentive mechanism to reveal our true forecast during normal weather conditions. This was achieved by setting a symmetric 5% band of variation around demand forecasts, measured over the relevant four years. Variances outside this band would be assessed by IPART for reimbursement to customers or Sydney Water at the beginning of the next price period. This approach shares risks between customers and us, for uncontrollable deviations in actual demand relative to forecast demand, correcting for windfall gains or losses.

[39] Allowable levels are those that will be allowed in the 2020–24 determination for non-drought conditions.
[40] Sydney Water Price Proposal 2020–24, Attachment 6: Regulatory Framework, section 2.4, 1 July 2019, p. 7.
[41] Sydney Water, Response to Issues Paper, October 2019, pp. 41-47.
[42] The exception is the 2016–20 period where the initial application of the DVAM would be based on only 3 years of available actual data since the DVAM was introduced for 2016-20.

Building on this framework, under our proposed DRAM, revenue recovery would occur with a one-year lag on the first billing cycle of each year (1 July). Following the general approach adopted in the SDP pass-through,[43] the determination forecast would be assessed against actual demand for the first 10 months of the financial year (July-April), and then against two months of assumed demand (May and June).[44] The difference between the actual and assumed demand in May and June would be trued-up in the following year's DRAM calculation. Table 3-4 provides an example of the application of the DRAM. Numbers used are for illustrative purposes only.

Table 3-4 Example – Demand revenue adjustment mechanism recovery and true-up

	Jul-19 to Apr-20	May-20	Jun-20	Total	Jul-20 to Apr-21	May-21	Jun-21	Total
Determination (GL)	100	10	10	**120**				
Lower deadband (5%) (GL)[a]	95	9.5	9.5	**114**				
Assumed (GL)	75	8	8					
Actual (GL)	75	(8.5)	(7)					
Net ΔGL (actual/assumed)	-20	-1.5	-1.5	**-23**				
Gross DRAM ($m) 20-21[b]				**49**				
Determination (GL)					105	11	11	**127**
Lower deadband (5%) (GL)					99.8	10.5	10.5	**120.7**
Assumed (GL)					78	8	8	
Actual (GL)					78	(6.5)	(6.5)	
Net ΔGL (actual/assumed) + true-up (May & June 20)		0.5[c]	-1	**-0.5**	-22	-2	-2	**-27**
Gross DRAM ($m) 21-22[d]								**58**

a – Lower deadband is shown as the aggregate of 10 months and individually for May and June for illustrative purposes, the 5% deadband variation will be assess in aggregate for year eg 75 + 8 + 8.
b – Gross revenue to be recovered in 2020-21 before NPV adjustment.
c – Calculated as 0.5 = 8.5-9.5-(-1.5). Note there is an over-recovery of 0.5 GL when comparing assumed in 2019-20 to actual in 2020-21, the additional revenue held for 12 months can be adjusted for in NPV terms before recovering revenue in 2021-22.
d – NPV net true-up amount of -0.5 is discounted by 5.9% real pre-tax WACC before multiplication by $2.11 k/L usage price and NPV adjustment for under/over recovery held or not compensated for in May-20 and June-20 respectively.

Key points to note include:

- a gross revenue amount of $49 million would be used to calculate the final recovery amount via the 20 mm service charge in 2020–21, based on variations of actual and assumed demand greater than 5% of demand for the year as set out in the 2016 Determination

[43] IPART, *Sydney Desalination Plant Pty Ltd Review of prices from 1 July 2017 to 30 June 2022*.
[44] Assumed demand impact is applied as actual demand will not be available at the time bills are calculated.

- the true-up in 2020–21 shows there was a net -0.5 GL under-recovery, and gross revenue is adjusted in NPV terms for a 0.5 GL over-recovery in May 2020 plus a -1 GL under-recovery in the next billing cycle.

The above example assumes that all triggers for the DRAM are 'turned-on' as at June 2019. However, should the timing of triggers change, the DRAM would not be applied for the given period – instead the DVAM would continue to apply. Additionally, should a trigger 'turn-on' part way through a year, then only the relevant part of the year will apply to the DRAM and DVAM. An example of the change in assumed timing of triggers is illustrated below using the baseline forecast as provided in our Proposal. Numbers used are for illustrative purposes only.

Table 3-5 Impact of triggers on demand volatility adjustment mechanism and demand revenue adjustment mechanism

	2019-20	**2020-21**	**2021-22**	**2022-23**	**2023-24**	**Total 2019 - 2023**
Forecast (GL)	507	512	519	525	533	**2063**
Deadband 5%	482	486	493	499	506	**1960**
Actual (GL)	480	467	489	598	533	**2034**
Triggers	-5.3%, no restrictions	-9%, 12mths restrictions	-6%, 7mths restrictions	-5%, no restrictions	0%, no restrictions	
DVAM (GL >5%)	-2	0	-1.6 (-4)	-1	0	**-7**
DRAM (GL >5%)	0	-19	- 2.4 (<5% becomes DVAM)	0	0	**-19**

In the example above, the DRAM will apply only for the 12 months of 2020–21. This is because in 2021–22 the change in demand for the year was *not* >5% despite restrictions applying for the year (and possibly the variation for the seven months of restrictions having been >5% variation), which does not meet the trigger threshold of 5%. This assessment on an entire year is consistent with how we forecast demand (that is, on a yearly basis), and so should retain the DVAM incentive. The DVAM will be assessed on the remaining years (excluding 2023–24, as this would be assessed at the end of the next price determination period in 2027–28) including any NPV ex-post adjustment that may be needed.

The NPV ex-post adjustment is vital as it will ensure that even if the DRAM is applied in any particular year, the 5% deadband in aggregate for the DVAM period is retained. This ensures there are no windfall gains or losses for Sydney Water, and customers will always benefit from the 5% deadband incentive.[45]

In our example, the total actual demand for the four-year DVAM period is 2034 GL. However, the deadband in aggregate is 1960 GL. In such a case, the DVAM would not have been triggered (<5% variation in aggregate), despite the DRAM being triggered within period (>5% variation with restrictions).

In summary, the proposed DRAM has the following features:

- two triggers must hold; >5% variation for the year in aggregate plus restrictions in place
- revenue >5% variation recovered via service charges in the following year net of avoided costs
- years in which the DRAM is applied are excluded from the DVAM calculation
- the DRAM is subject to ex-post assessment against the core DVAM criteria of >5% for all four relevant years, retaining the DVAM forecasting incentive
- revenue applicable to the DRAM is assessed on 10 months of actuals and 2 months of assumed demand, which is trued up in NPV terms in the following year.

We provide an example of the impact of the application of DRAM on our revenue, and the proposed flow-through to prices in section 5.3.2.

3.2.3 Recovery via service charges

We have proposed to recover the drought cost pass-through, and DRAM amounts via the water service charge.

We acknowledge that the Shoalhaven transfer costs and SDP costs, when triggered, are recovered via the water usage charge, with any over or under recovery trued-up via the service charge, in line with IPART's pricing principles.[46]

Broadly, IPART's principles[47] are that prices should be cost reflective, and should:

- only recover sufficient revenues
- match the underlying cost structures (eg usage charges set with reference to variable or marginal costs, and service charges recovering remaining costs).

However, we consider that recovery of drought costs and under-recovered revenues via a service charge is the most efficient method and is also in line with IPART's pricing principles:

- the primary objectives of our mechanisms are to recover cost and revenue in a timely way, as opposed to incentivising behavioural change. Encouraging appropriate water consumption behaviour is instead a key objective of pricing water usage at the long-run or short-run marginal cost of supply

[45] The adjustment holds the DVAM incentive constant, while allowing annual variation should it be needed.
[46] IPART, *Review of price structures for metropolitan water utilities Water — Final Report* March 2012.
[47] The principles also include consideration that customers imposing similar costs on the system pay similar prices.

- our mechanisms aim to be cost and revenue neutral in line with IPART's pricing principles. Recovery via a service charge ensures this goal can be achieved
- changes in demand do not change our cost pass-through amounts,[48] unlike the existing Shoalhaven transfer and SDP costs. Marginal cost pricing for water in the short-run (and long-run) is based on costs which are driven by variations in demand ie treatment, pumping, etc
- the addition of short-run costs or under-recovered revenue to the long-run marginal cost of water (the current usage price) has no clear economic meaning, and is unlikely to be cost or revenue neutral, creating the need for rebates during times of restrictions which can produce a perverse outcome
- the administrative costs of assessing rebates for individual customers is likely to be high
- service charge recovery of revenues within period is likely to be in line with how IPART would recover revenues in subsequent determination periods under the DVAM when demand and revenue has recovered
- service charge recovery will ensure a degree of bill stability, transparency and ease of understanding for customers in relation to drought-related bill increases and is administratively simple to apply
- recovery via a usage charge may send unclear signals to entrants or customers who may invest in water saving technology for the long run, only to have short-run price variations rolled back, producing an inefficient investment in, and use of, water assets.

3.3 Assessment against IPART's criteria

We assess our drought cost pass-through mechanism and DRAM against IPART's cost pass-through criteria in Table 3-6. It is useful to assess the DRAM against these criteria as there are elements of risk sharing and general underlying incentives of demand forecasting which are inherent in the broader regulatory approach.

[48] Water conservation costs are driven by dam levels, and dam levels are a function of inflow and outflows, of which demand (an outflow only) is a part. Water conservation can only slow the outflow of demand via demand management schemes ie substitution of technologies or behavioural change messages etc.

Table 3-6 Assessment against IPART criteria

IPART criteria	Cost pass-through	DRAM
Trigger(s)	• Network upgrade due to SDP expansion – government decision • Water conservation – dam levels 50%, 40%, 30% • Water restrictions – level 1 restrictions.	Level restrictions.
Ex ante efficiency assessment and separability	Capital and operating cost forecasts provided to IPART for prudency and efficiency assessment.	Restriction forecasts trued-up annually, net of avoided regulated water treatment costs.
Materiality	Financeability impact on us is material in absolute and percentage terms.	
Controllability	Triggers are based on government decisions or requirements in our Operating Licence, all of which are outside of our control.	
Symmetric	Not applicable given the nature of drought.	
Impact	Capital cost recovery in the relevant period following each trigger more closely matches the timing of when the costs are incurred (ie relative to an ex-post true up). Operating costs and revenues recovered in the year the costs are incurred, more accurately signalling the true cost of providing water services and meeting regulatory requirements.	

We consider our mechanisms meet all of the applicable criteria and, more broadly, represent an improvement on the application of pass-through mechanisms in the regulatory framework.

4 Revenue requirement

Key messages

- Our updated Annual Revenue Requirement includes additional base capital and operating expenditure. This includes increased spending to improve system resilience that will continue over 2020–24, even if drought conditions end.
- Our average target Annual Revenue Requirement is $2.7 billion ($2019–20) a year over 2020–24. This is about $76 million higher than the yearly target in the 2016 Determination.
- Our Regulatory Asset Base increases from $19.1 billion in 2019–20 to $22.6 billion by 2023–24, an increase of 18%.
- In drought conditions, there will be additional costs above our base costs. We propose to recover these additional drought costs through a pass-through mechanism (see Chapter 3).
- We propose IPART should manage the impact of water restrictions on our revenue by an adjustment mechanism (see Chapter 3). Our proposed mechanism will allow us to recover the revenue we need to deliver our services and would make us no better off than in an unrestricted demand scenario.

4.1 Annual Revenue Requirement

We have updated our proposed Annual Revenue Requirement (ARR) for 2020–24. The updated ARR includes our proposed additional base expenditure, as outlined in Chapter 2.

In addition, we are proposing to pass through the costs of additional drought measures to bills when the measures are triggered (see Chapter 3). This is similar to how IPART currently passes through costs related to operating the desalination plant. We outline the potential increase in revenue from drought cost pass-throughs, over and above the base revenue requirement, in section 4.7.

We use a building block approach to calculate our notional ARR for water, wastewater and stormwater services in each year of the price path. We then propose target revenues for each year on an NPV neutral basis, aiming to balance the interests of Sydney Water and customers and avoid large annual shifts in bills. Our approach is explained in more detail in Attachment 11: Proposed revenue requirement of our Price Proposal.

The additional expenditure in this Update has been added to the notional revenue requirement presented in our July Proposal. We have then established a revised target revenue by smoothing the revised notional revenue requirement on an NPV neutral basis.

4.2 Building block revenue

Figure 4-1 shows the average target ARR in our 2016 Determination compared to our proposed average target ARR for 2020–24. Overall, increased capital and operating expenditure to cater for growth, renewals and improved resilience are largely offset by efficiency and funding cost savings.

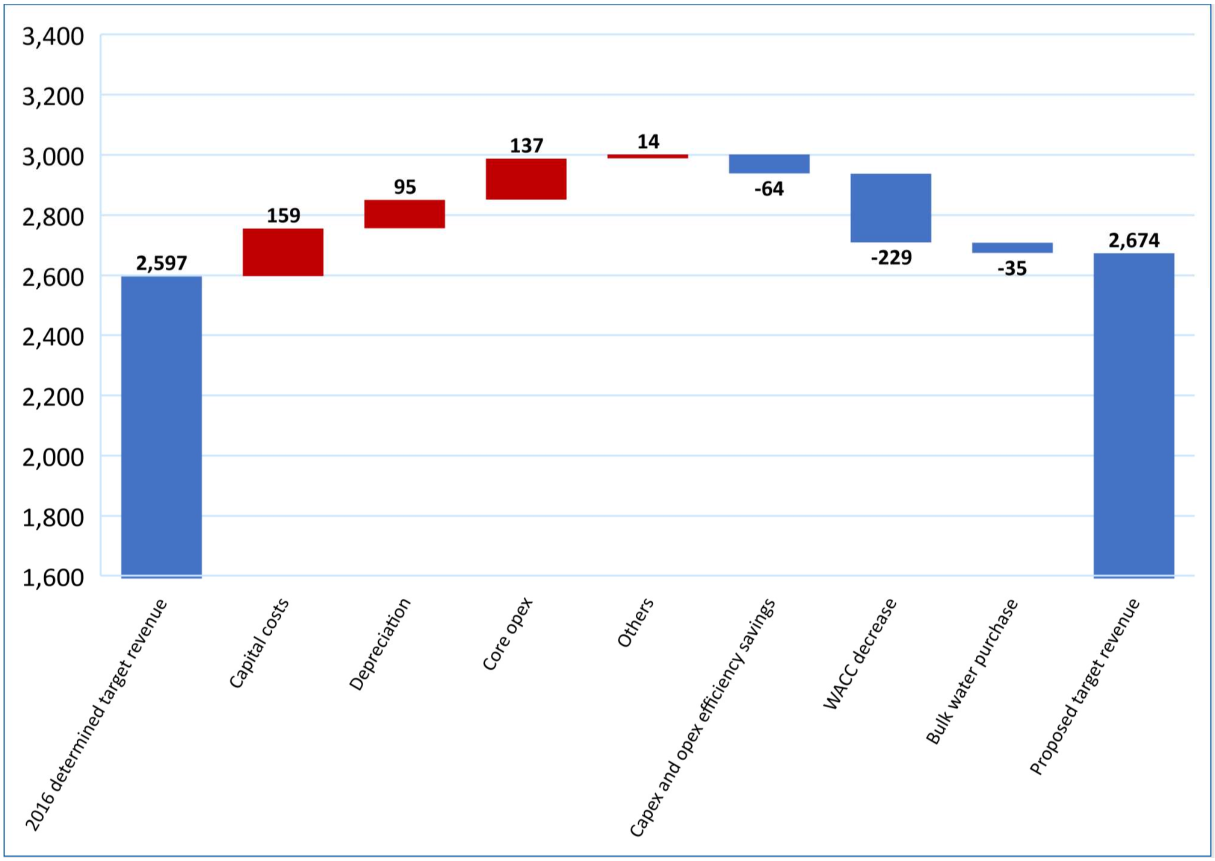


Figure 4-1 Contributing factors to changes in revenue requirement ($2019–20 million)

Note: Data shown is an average of the four years in each determination.

Our updated average target ARR over 2020–24 is $2.7 billion. This is a moderate increase, $76 million higher than the level set in the 2016 Determination. This is a result of:

- increased capital, operating and depreciation costs
- our efficiency gains and the efficiency challenges we have set for ourselves in 2020–24. This includes our additional operating expenditure efficiency target of $89 million over 2020–24 that we are offering, to ease bill impacts on customers
- the use of IPART's latest published Weighted Average Cost of Capital (WACC) of 3.8%
- the long-lived nature of our new assets, where only a small portion of the returns of investment is recovered through 2020–24's ARR.

Table 4-1 compares our building block revenue requirement in our July 2019 Proposal and this Update. We have also incorporated a $17.1 million revenue rebate adjustment from the demand volatility adjustment mechanism in 2016–19 to customers.

Table 4-1 Building block revenue requirement ($2019–20 million)

		1 Jul 2019 Price Proposal 2020–24	12 Nov 2019 Update 2020–24	Variance Nov 2019 vs Jul 2019
	Operating expenditure Total	5,380	5,511	132
	– Core operating expenditure (including water treatment)	3,902	4,038	135
	– Water purchase	1,477	1,474	-4
Plus	Return on Assets	3,342	3,174	-168
	Real post-tax WACC	*@ 4.1%*	*@ 3.8%*	
Plus	Regulatory Depreciation	1,665	1,693	28
Plus	Return on Working Capital	45	39	-6
Plus	Tax Allowance	278	286	8
	Notional Revenue (including Tax)	**10,709**	**10,702**	**-7**
Minus	Other Revenue (Trade waste/Ancillary services/Rent etc)	155	175	20
	Notional Revenue from Water/Wastewater/Stormwater	**10,554**	**10,527**	**-27**
	Target Revenue from Water/Wastewater/Stormwater	**10,545**	**10,520**	**-25**

Notes: Operating expenditure shown includes Sydney Desalination Plant (SDP) costs assuming the plant is in shut-down mode, and no Shoalhaven transfers.
Core operating expenditure includes section 16A recycled water costs, net of revenue.
The return on assets, depreciation and return on working capital are mid-year discounted.

4.3 Yearly revenue requirement

Table 4-2 shows our updated notional revenue requirement by each of the building block elements and our target revenue requirement. Under our proposed price path (similar to our July 2019 Proposal), after adjustments, the target revenue for water, wastewater and stormwater services would drop marginally in the first year from $2.58 billion in 2019–20 to $2.57 billion in 2020–21, and then gradually increase to $2.69 billion in 2023–24. This is an increase of 4.5% or $117 million from the level in 2019–20.

We have made the following adjustments to our base revenue requirement, compared to our July 2019 Proposal:

- used an actual 2018–19 CPI of 1.6% instead of an assumed CPI of 2.2%
- used the latest published post-tax WACC of 3.8% instead of a post-tax WACC of 4.1%
- increased core operating expenditure for 2020–24 by $135 million
- increased capital expenditure for 2019–24 by $644.4 million, of which $93.9 million is forecast for 2019–20
- used updated trade waste prices, to correct minor errors in the July 2019 Proposal
- reduced revenue for 2020–24 by $17.1 million, applying a demand volatility adjustment for the three-year period from 2016–17 to 2018–19.[49]

Table 4-2 The elements of notional revenue requirement ($2019–20 million)

	2019–20	2020–21	2021–22	2022–23	2023–24
Return on assets		741.7	780.2	811.7	840.1
Return of assets (depreciation)		373.7	410.0	440.9	468.4
Operating expenditure		1,357.6	1,396.6	1,385.8	1,371.5
Return on working capitals		7.5	9.9	10.3	11.0
Tax allowance		79.1	64.5	64.5	77.6
Total notional revenue requirement (pre-adjustments)		**2,559.6**	**2,661.1**	**2,713.2**	**2,768.6**
Total target revenue requirement (pre-adjustments)	**2,631.8**	**2,627.2**	**2,648.6**	**2,686.8**	**2,732.3**
Less adjustments:					
Ancillary services		12.3	12.4	12.6	12.7
Trade waste		24.6	24.8	25.1	25.4
Wastesafe		0.5	0.6	0.6	0.6
Blue Mountains CSO		0.1	0.1	0.1	0.1
Rental income (10%)		1.0	0.9	0.9	0.9
BioBanking (10%)		1.0	0.5	0.2	0.5
Demand volatility adjustment		17.1			
Total adjustments		56.6	39.3	39.4	40.1
Total target revenue from tariffs	**2,575.1**	**2,570.6**	**2,609.4**	**2,647.5**	**2,692.2**
Real post-tax WACC	4.9%	3.8%	3.8%	3.8%	3.8%

[49] We have applied the demand volatility adjustment mechanism using the method outlined in our July 2019 Price Proposal, with an adjustment for costs incurred to meet higher than forecast demand. IPART noted its preliminary view to accept Sydney Water's proposal, subject to further analysis, in its Issues Paper (p 82).

Table 4-3 compares our updated proposed target revenue with the forecast in our July Proposal, by services, which shows that:

- water services has gone up by 3.7%, with additional baseline costs largely offset by the lower WACC
- wastewater and stormwater services have gone down by 3.5% and 4.7%, mainly due to the lower WACC.

Table 4-3 Target revenue by services ($2019–20 million)

	1 Jul 2019 Price Proposal	12 Nov 2019 Update	Change Nov 2019 Update vs Jul 2019	
	2020–24	2020–24	2020–24	Percentage
Water	5,174	5,365	191	3.7%
Wastewater	5,362	5,174	-188	-3.5%
Stormwater	164	156	-8	-4.7%
Total target revenue	**10,700**	**10,695**	**-5**	**0.0%**

4.4 Operating expenditure by service

Our updated operating expenditure of $5,511 million over 2020–24 represents a significant proportion (51.5%) of the total notional revenue requirement. This is about $132 million (2.5%) higher than in July. The net increase mainly comprises of:

- an additional $212 million expenditure proposed to improve system resilience and sustain operational performance
- an adjustment of $12 million for the understatement of allowable water filtration plant BOO operating costs in our July Proposal
- a decrease of $89 million in additional operating expenditure savings we have proposed.

Further detail on changes to operating expenditure is provided in Chapter 2.

The allocation of our additional $89 million target operating efficiency savings has been done based on the total operating cost base of the services, as shown in Table 4-4.

Table 4-4 Regulatory operating expenditure efficiency savings ($2019–20 million)

	2020–21	2021–22	2022–23	2023–24
Water	2.5	8.0	13.3	21.5
Wastewater	2.5	7.5	12.4	19.9
Stormwater	0.1	0.2	0.4	0.6
Total operating expenditure efficiency savings	**5.1**	**15.7**	**26.1**	**42.0**

With the inclusion of the above efficiency savings, Table 4-5 shows our operating expenditure by water, wastewater and stormwater services. It also includes an updated allocation of corporate common costs to water, wastewater and stormwater services.

Table 4-5 Regulatory operating expenditure by services ($2019–20 million)

	2020–21	2021–22	2022–23	2023–24
General O&M costs				
Water[1]	330.9	340.3	333.9	324.3
Wastewater	429.0	425.3	413.9	403.9
Stormwater	12.9	13.0	13.0	13.0
Total general operating costs	772.7	778.6	760.9	741.2
Water purchase and treatment				
BOO costs	101.0	101.7	101.8	102.4
WaterNSW	189.2	193.7	199.6	202.8
SDP[2]	180.6	178.8	178.8	178.8
SDP adjustment of 2019–20[2,3]	-$28.6			
Total water purchase and treatment	442.2	474.3	480.2	484.0
Corporate common costs				
Water	90.5	91.7	93.2	94.4
Wastewater	50.6	50.4	50.0	50.3
Stormwater	1.5	1.5	1.6	1.6
Total corporate common costs	142.6	143.7	144.8	146.3
Total operating costs by products				
Water	863.6	906.3	907.2	902.6
Wastewater	479.6	475.7	464.0	454.2
Stormwater	14.4	14.6	14.6	14.6
Total regulatory operating expenditure	**1,357.6**	**1,396.6**	**1,385.8**	**1,371.5**

Notes: Totals may not add due to rounding.

[1] General O&M costs for water include 16A recycled water costs net of revenue.

[2] It is assumed the SDP is not in operation for forecasting SDP costs.

[3] Pre-tax WACC = 5.9% is used to calculate the SDP adjustment of 2019–20.

4.5 Capital expenditure by service

Our updated base capital expenditure of $5,257 million over 2020–24 is $551 million higher than the $4,706 million in our July 2019 Proposal. An opening Regulatory Asset Base (RAB) of $19.1 billion (see Table 1 8) as at 1 July 2020 and a lower WACC of 3.8% provide returns of $4,867 million (45.5%) to the total notional revenue requirement. The net increase mainly comprises of:

- increasing investment by $525 million to improve system resilience (the Prospect to Macarthur link and Cascade water supply project)
- other capital adjustments of $25.2 million in total, to reflect changes in forecasts for digital expenditure and other projects.

Further detail on changes to capital expenditure is provided in Chapter 2.

Table 4-6 shows our capital expenditure by water, wastewater and stormwater services that we incorporated in the RAB. The proposed capital expenditure in the RAB has been adjusted to exclude Rouse Hill stormwater drainage capital expenditure.[50]

Table 4-6 Regulatory capital expenditure ($2019–20 million)

	12 November 2019 Update					1 July Proposal
	2020–21	2021–22	2022–23	2023–24	Total	2020–24
Capital expenditure (excluding finance leases)						
Water	626.5	256.2	290.2	209.5		
Wastewater	721.5	766.2	791.2	824.3		
Stormwater	31.8	46.5	43.3	48.0		
Corporate	139.0	119.8	76.9	64.0		
Total capital expenditure	1,518.8	1,188.6	1,201.6	1,145.8	5,054.8	4,504.2
Finance leases upgrade						
Water – Macarthur	1.2	0.0	0.0	0.1		
Water – Prospect	46.1	76.9	59.5	18.5		
Total finance leases upgrade	47.4	76.9	59.5	18.5	202.2	202.2
Capital expenditure in RAB						
Water	673.9	333.0	349.7	228.0	1,584.6	1,059.3
Wastewater	721.5	766.2	791.2	824.3	3,104.4	3,051.0
Stormwater	31.8	46.5	43.3	48.0	169.6	169.6
Corporate	139.0	119.8	76.9	64.0	399.6	426.6
Total capital expenditure in RAB	**1,566.2**	**1,265.4**	**1,261.0**	**1,164.3**	**5,257.0**	**4,706.4**

[50] Rouse Hill stormwater capital expenditure is recovered partially (50%) through Rouse Hill drainage land charges and the remainder through an adjustment to the wastewater RAB.

4.6 Annual value of the Regulatory Asset Base by element

Table 4-7 shows our RAB values for 2016–20 and 2020–24. Using the process outlined in our Price Proposal, the closing RAB in 2015–16 of $15.4 billion is expected to grow to a closing RAB of $19.1 billion by 2019–20. The RAB then increases to $22.6 billion by 2023–24, an 18% increase compared to 2019–20.

For this Update, we made the following adjustments to our RAB rollover calculation for 2015–19:

- updated forecast 2018–19 capital expenditure with actual 2018–19 capital expenditure
- replaced the opening RAB as at 1 July 2019 using actual CPI of 1.6% instead of the forecast 2.2% that was used in July 2019
- updated our forecast 2019–24 capital expenditure
- corrected a mis-allocation of $48.5 million in 2018–19 from wastewater to water services, an error identified during IPART's efficiency review of our July 2019 Proposal.

Further detail on capital adjustments is provided in Chapter 2.

Table 4-7 Regulatory asset base ($million)

		2016 Determination period (nominal)				2020 Determination period ($2019–20)			
	2015–16	2016–17	2017–18	2018–19	2019–20	2020–21	2021–22	2022–23	2023–24
Opening RAB									
RAB excl finance leases	14,825.9	15,360.0	15,996.3	16,771.2	17,531.9	18,550.6	19,699.1	20,481.9	21,247.7
RAB of finance leases	–	500.8	500.6	504.6	508.0	553.4	588.3	651.3	695.4
Adjustment	–	24.8							
Total opening RAB	14,825.9	15,885.6	16,496.9	17,275.7	18,039.9	19,103.9	20,287.4	21,133.2	21,943.1
Capital expenditure									
Capital expenditure excl finance leases	674.7	604.6	776.1	820.4	922.4	1,518.8	1,188.6	1,201.6	1,145.8
Capital expenditure of finance leases	–	2.3	5.6	7.7	44.8	47.4	76.9	59.5	18.5
Total capital expenditure	674.7	606.9	781.7	828.1	967.3	1,566.2	1,265.4	1,261.0	1,164.3
Cash capital contribution	0.0	0.6	1.0	7.3	–	–	–	–	–
Asset disposals	15.4	8.5	39.0	0.3	0.8	1.9	1.9	1.9	1.9
Regulatory depreciation									
Depreciation excl finance leases	276.6	281.9	305.0	327.0	352.8	368.3	403.9	433.8	461.0
Depreciation of finance leases	–	12.0	12.2	12.4	12.7	12.4	13.8	15.4	16.2
Total depreciation	276.6	293.9	317.2	339.5	365.5	380.7	417.7	449.2	477.3
Indexation									
Indexation excl finance leases	151.6	298.0	343.7	274.8	449.8	–	–	–	–
Indexation of finance leases		9.5	10.6	8.1	13.3	–	–	–	–
Total indexation		307.5	354.2	283.0	463.1	–	–	–	–

Closing RAB	**15,360.0**	**16,496.9**	**17,275.7**	**18,039.9**	**19,103.9**	**20,287.4**	**21,133.2**	**21,943.1**	**22,628.3**
Water	4,763.9	5,329.5	5,505.3	5,699.8	6,027.0	6,603.9	6,833.0	7,073.7	7,188.7
Wastewater	9,665.5	10,174.3	10,681.8	11,168.0	11,822.7	12,346.3	12,897.8	13,456.9	14,030.7
Stormwater	312.2	340.7	373.8	390.0	415.2	444.4	487.1	526.5	570.2
Corporate	618.4	652.5	714.9	782.0	839.1	892.8	915.3	886.0	838.7

Analysis of the revenue requirement by services shows that for 2019–23:

- there is an average of $323 million a year in capital investment for water assets to cater for growth, maintain services, improve system resilience and operational performance. This is a 75% increase compared to our average capital investment in water services of $184 million a year in 2015–18
- there is an average of $731 million per year in capital investment for wastewater assets to cater for growth, maintain services and improve operational performance. This is a 74% increase compared to our average capital investment in wastewater services of $421 million a year in 2015–18.

4.7 Indicative revenue recovery during drought

In addition to the base target revenue requirement, we propose to recover additional revenue during drought from existing and proposed pass-through mechanisms. This additional revenue would only be recovered when drought measures are triggered, to fund these measures.

We provide an example of how drought cost pass-throughs could affect our revenue requirement in Table 4-8. For illustrative purposes, all drought cost pass-throughs are assumed to be triggered in 2020–21 and continue until 2023–24.

Table 4-8 Base revenue and example of drought cost pass-throughs ($2019-20 million)

	2020–21	2021–22	2022–23	2023–24	Total
Base revenue from usage and service charges	**2,571**	**2,609**	**2,647**	**2,692**	**10,520**
Revenue from existing SDP and Shoalhaven pass-through mechanism[1]	88	88	88	88	350
Revenue from new drought cost pass-thoughs[2]					
Implementing restrictions & advertising	26	26	27	27	106
Water conservation[3]	50	51	52	53	207
SDP expansion network upgrade	15	15	15	16	61
Indicative revenue from usage and service charges	**2,749**	**2,790**	**2,829**	**2,876**	**11,244**

Notes:

[1] This figure is an indicative only, assuming the total customer bill impact of $40 in 2020–21 and no increase each year afterward. Actual revenue recovered will be subject to an annual true-up process, as determined by IPART.

2 Revenue is smoothed on NPV neutral base. Figures are based on potential drought costs outlined in Chapter 2.

3 Water conservation costs based on assumed dam levels of 40-30%. If dam levels fall below 30%, additional revenue of $11 million/year would be required.

Indicative impacts to revenue and adjustments for our proposed DRAM are shown in section 5.3.2.

5 Prices

Key messages

- Our updated prices reflect changes to baseline expenditure and our additional efficiencies.
- Our revised base water service charge for a residential customer is $98 a year ($2019–20). This includes new projects and ongoing activities to improve the resilience of our system. This compares to a service charge of $82 a year in 2019–20.
- Our proposed base water usage price remains at $2.11/kL ($2019–20) in 2020–21.
- We also show indicative impacts on water prices during drought.
- Assuming the drought continues, the annual water service charge for a residential customer will range from $142 to $156 a year ($2019–20) from 2020-21. This includes the base service charge plus the pass-through of costs for the existing desalination plant and proposed Sydney Water drought costs.
- During drought, the water usage charge increases to $2.24/kL ($2019–20) in 2020–21. This includes the base usage price of $2.11/kL, with a $0.13/kL uplift when the desalination plant is operating.
- In addition to drought cost pass-throughs, water service charges would be further adjusted each year during drought to account for lost revenue during restrictions.
- If the drought ends, water charges will decrease as we will stop passing through costs for drought measures that are no longer needed.
- We have not included potential third-party drought costs. For example, new drought measures proposed by WaterNSW or building the expanded desalination plant.
- We have not changed our proposed wastewater usage charge of $0.61/kL ($2019–20).
- Our updated wastewater service charge for a residential customer is $563 a year ($2019–20) in 2020–21, compared to $616 a year in 2019–20. Revised wastewater charges include increased expenditure for environmental requirements and a sustained increase in our operational capability.
- Stormwater prices are now $81 a year ($2019–20) for a house and $25 a year ($2019–20) for an apartment in 2020–21.
- From 2021–22, we propose prices should rise with inflation until 2023–24.

5.1 Overview of updates

This chapter outlines key changes to prices and charges, including:

- updated base prices for major services (water, wastewater and stormwater services) using our updated revenue requirement
- indicative increases to water charges to recover drought cost pass-throughs
- indicative increases to water charges based on our proposed demand revenue adjustment mechanism
- amendments to trade waste prices, to correct minor modelling errors in our July 2019 Proposal.

Drought costs would only be passed through to charges once certain triggers are met.

In deriving base prices, we used our July 2019 demand forecast, after updating dwelling forecasts with 2018–19 actual outturns. As the length of restrictions is uncertain and beyond our control, we propose dealing with differences in revenue due to restrictions via a revenue adjustment mechanism (see Chapter 3).

We have not changed the key principles that we used in our July 2019 Proposal. For example, our general principle of adopting a steady price over the price path (except in the case of savings, where these are passed through up-front).

Full schedules of all updated prices are included in Appendix 2.

5.2 Prices for water, wastewater and stormwater services

Table 5-1 shows our updated base prices for water, wastewater and stormwater services.

Table 5-1 Updated base prices for major services ($2019–20)

	2019–20 prices		Proposed 2020-24 prices	
	Forecast CPI 2.2%	Actual CPI 1.3%	July Proposal	November Update
Water				
Water usage ($/kL)	2.13	2.11	2.13	2.11
Water service – 20 mm ($/year)	83.02	82.28	73.46	97.54
Wastewater				
Wastewater usage ($/kL)	1.18	1.17	0.61	0.61
Wastewater service – 20 mm ($/year)	590.74	585.80	658.13	628.34
Deemed usage charge ($/year)	177.83	176.34	91.51	91.51
Stormwater				
Service charge – residential single ($/year)	79.55	78.88	86.12	80.98
Service charge – residential multi ($/year)	24.83	24.62	26.88	25.28

Notes:
Water service charge is estimated with adjustment of Sydney Desalination Plant (SDP) assuming plant and Shoalhaven transfer are not in operation.
Sydney Water proposes prices in daily rates. Prices for 2020-24 in the table are annual rates, based on 365 days a year.

Our updated base prices reflect changes to base revenue (see Chapter 4). With our updated expenditure forecasts, the lower WACC and the use of the actual CPI for 2019–20 prices, movements in our revenue requirement and proposed prices include:

- base water services revenue is 3.7% higher than in our July 2019 Proposal:
  - retaining a base water usage price at the current level of $2.11/kL, our updated base 20 mm water service charge will be $97.54 in 2020–21. This is 32.8% higher than what we proposed in July
  - compared to 2019–20, the base 20 mm water service charge will now increase by 18.5% in 2020–21.
- wastewater services revenue is 3.5% lower than in our July 2019 Proposal:

- retaining our proposed wastewater usage price at $0.61/kL, our updated wastewater service charge for a residential customer will be $563 in 2020–21.[51] This is about 3.8% lower than in our July 2019 Proposal
- compared to 2019–20, the wastewater charge for a residential customer will now decrease by 8.6% in 2020–21.

- stormwater services revenue is 4.7% lower than in our July 2019 Proposal:
  - retaining the current pricing structure, our updated stormwater service charge for a typical residential customer is about 6% lower than in our July 2019 Proposal
  - compared to 2019–20, stormwater service charges will now only increase by about 2.7% in 2020–21
  - stormwater charges have changed because of the updated WACC and updated CPI used for 2019–20 prices. There have also been minor changes to the proposed stormwater expenditure from common costs allocation and additional efficiency savings assumed.

5.3 Indicative increases to water prices during drought

We have calculated indicative increases to water prices that would apply during drought.

We would like to work with IPART on the application of our proposed cost pass-throughs and demand revenue adjustment mechanism over the coming months.

5.3.1 Indicative increases for drought response measures

In the 2016 Determination, IPART included a pass-through mechanism for the additional costs we incur when the desalination plant is operating. It aims to be revenue neutral. When the plant is on, we first recover our costs through an uplift to the water usage charge.[52] We then pass through the difference in our costs and the revenue recovered from the usage charge uplift to customers in the next year. The difference is passed through to water service charges.[53]

Table 5-2 shows the uplift to the water usage charge when the desalination plant is operating. In our July 2019 Proposal, we supported the uplift remaining at its current level of $0.13/kL.

Table 5-2 Uplift to water usage charge ($/kL, $2019–20)

	Water usage charge		
	Unit price	SDP is off	SDP is on
Base water usage charge	2.11	2.11	
SDP is on – uplift charge	0.13		2.24

[51] Residential wastewater service charges are calculated by applying a discharge factor of 0.75 to the 20 mm service charge then adding the deemed usage charge.
[52] This uplift charge is triggered when the desalination plant is required to operate under the conditions of its licence.
[53] That is, the cost pass-through mechanism passes through at a one-year lag the actual difference in revenue recovered from the SDP uplift to water usage charges (positive or negative) and our additional costs related to the operation of the desalination plant to Sydney Water's fixed water service charges.

As part of this Update, we propose IPART extend cost pass-through arrangements to other Sydney Water drought response measures (see Chapter 3), via the water service charge.

This could include both operating and capital drought related costs. Proposed expenditure could total around $347 million in operating costs and $436 million (including $68 million in 2019–20) in capital expenditure. Table 5-3 shows the indicative uplift to water service charges of our drought cost pass-throughs at different dam levels. These costs would only be passed through at their defined trigger points.

Table 5-3 Indicative uplift to water service charge, based on 20 mm meter, for drought cost pass-throughs ($/year, $2019–20)

	Dam levels		
	50%–40%	**40%–30%**	**Below 30%**
Base water service charge	98	98	98
Existing SDP and Shoalhaven pass through mechanism[1]	11	11	11
Uplift for other Sydney Water drought related operating costs (excluding water conservation costs) [2]	12	12	12
Uplift for water conservation costs	15	23	28
Uplift for Sydney Water network upgrade if desalination plant is expanded (capital and operating costs)[3]	7	7	7
Indicative water service charge	**142**	**151**	**156**

Notes: The trigger points for each cost pass-through may not be the same.

[1] The service charge due to the existing SDP and Shoalhaven pass-through mechanism is estimated based on 220kL residential consumption and a total bill impact of $40. This may differ under a different consumption scenario.

[2] This includes water restrictions, advertising and drought management operating costs.

[3] Uplift charges are smoothed on revenue requirement NPV neutral base for 2020–24 period.

While most drought costs are constant once triggered, the pass-through of water conservation costs depends on dam levels.

Indicatively, our water service charge could range from $142 to $156 a year for a residential customer, depending on drought conditions. This does not include the pass-through of third-party drought costs, for example, construction of an expanded desalination plant. The NSW Government has announced planning for this expansion, but final costs are not yet available. If these measures proceed, costs will be determined by IPART and then passed through to our bills.

5.3.2 Indicative increases for revenue adjustment

Our base prices are calculated using an unrestricted demand forecast. We propose IPART use a demand revenue adjustment mechanism when restrictions are in place, to recover under recovery of revenue due to lost water sales on an annual basis (see Chapter 3).

Table 5-4 shows a potential revenue adjustment over 2020–24 under a restricted demand scenario (see Appendix 3). Under this scenario:

- water sales for 2020–24 are 434 GL lower than under an unrestricted demand scenario. This translates to water sales that are $917 million lower than in our proposed revenue requirement over 2020–24
- we would recover some of the revenue shortfall via the water service charge. Applying our proposed adjustment mechanism, we would recover, on average, net water sales revenue of approximately $135 million a year over 2019–24.

Like the current demand volatility adjustment mechanism, we would not recover any lost revenue within 5% of our unrestricted demand forecast. That is, customers would not pay for the first $55 million of lost revenue each year.

Table 5-4 Example of potential net revenue loss under restricted demand scenario

	2019–20	2020–21	2021–22	2022–23	2023–24	Total 2020–24
Potable water sale (GL)						
Base potable water sale forecast	507	512	519	525	533	**2,089**
Restricted potable water sales (scenario)[1]	441	405	411	416	422	**1,655**
Less water sales due to restriction	66	107	108	109	111	**434**
Revenue from potable water sale (million, $2019–20)						
Base revenue from water sales	1,069	1,080	1,095	1,108	1,125	4,409
Revenue from restricted water sales scenario	930	855	867	878	891	3,492
Revenue loss - restricted water sales	139	225	228	230	234	**917**
Demand volatility adjustment						
Allowed water demand (GL)[2]	487	512	519	525	533	
Allowed demand with -5% deadband (GL)	463	486	493	499	507	
Demand below 5% deadband (GL)	22	81	82	83	84	
Revenue loss below 5% deadband (million)	47	171	173	175	177	
Less cost saving on water (million)	4	14	14	14	14	
Net revenue loss eligible for adjustment	**43**	**157**	**159**	**161**	**163**	

Notes:

[1] Water sales estimates assume a restricted demand scenario in line with the scenario in Appendix 3.

[2] Allowed demand is based on Sydney Water's demand forecast in our July 2019 Proposal for 2020–24.

Table 5-5 shows the indicative increase to the water service charge that would apply using the restricted demand scenario assumed in Table 5-4.

Table 5-5 Example of increase to water service charge for demand revenue adjustment mechanism ($/year, $2019–20)

	2020–21	2021–22	2022–23	2023–24
Indicative water service charge increase[1]	21	74	73	73

Note:[1] Based on the restricted demand scenario in Appendix 3.

5.4 Rouse Hill stormwater charges

Rouse Hill stormwater charges are different to stormwater charges in declared stormwater catchment areas.[54]

We have updated Rouse Hill stormwater charges to reflect:

- our updated WACC (based on IPART's latest published WACC)
- actual properties and expenditure in 2018–19
- the actual CPI adjustment for 2019–20 prices.

There has been no change to forecast Rouse Hill stormwater expenditure in 2020–24.

Our updated Rouse Hill land drainage charges are outlined in Table 5-6.

Table 5-6 Updated Rouse Hill land drainage charges ($/year, $2019–20)

Charge	2019–20	2020–21	2021–22	2022–23	2023–24
Rouse Hill land drainage charge	389.38	345.56	345.56	345.56	345.56

These charges are slightly higher than in our July Proposal, as a result of the update for 2018–19 actuals. There is still a decrease in 2020–21.

Our updated Rouse Hill stormwater drainage charges are outlined in Table 5-7.

Table 5-7 Updated Rouse Hill stormwater drainage charge ($/year, $2019–20)

	2019–20	2020–21	2021–22	2022–23	2023–24
Rouse Hill stormwater drainage charge with glide path	149.25	142.91	136.56	130.22	123.87

These charges are slightly higher than in July 2019, as a result of the update for 2018–19 actuals.

In our July 2019 Proposal, we set this charge to include recovery of a past under-recovery of operating expenditure by 2022–23. This recognised that the charge had previously been set below forecast costs. Our updated charge will still achieve a break-even on the past under-recovery of operating costs during 2020–24.

[54] There are two types of stormwater charges in Rouse Hill – the Rouse Hill land drainage charge (which is charged to new properties only for five years) and the Rouse Hill stormwater drainage charge (for existing and new properties).The reasons for these different charges are outlined in our July 2019 Proposal.

5.5 Other charges

Where applicable, we have updated all other charges to reflect:

- our updated WACC (IPART's latest published post-tax WACC of 3.8%)
- actual properties and expenditure in 2018–19
- the actual CPI adjustment for 2019–20 prices
- a reduction in the allocation of corporate costs for trade waste and miscellaneous charges, from 1.4% to 1.1% per year, in line with our updated operating expenditure forecasts
- updated service and usage charges.

Full schedules of our trade waste and ancillary services prices are included in Appendix 2.

5.5.1 Trade waste

We have updated trade waste charges with the revised parameters noted above. Compared to our July 2019 Proposal, total trade waste revenue has increased by around $1 million per year. Of this revenue, about 84% is generated from pollutant charges.

Key changes relate to industrial and commercial pollutant charges. These reflect:

- updates for the revised parameters noted above, as well as
- a refinement of our trade waste cost allocation methodology. This corrects minor errors in the modelling of trade waste prices included in our July 2019 Proposal.

Table 5-8 shows updated pollutant charges for industrial customers. Compared to July 2019, these charges have been revised down, with decreases ranging from one to twenty-two cents.

Table 5-8 Pollutant charges for industrial customers ($2019–20)

Industrial pollutant charges ($/kg[2])	July 2019 Proposal 2020–21	November Update 2020–21	Variance 2020–21
BOD - primary STPs[1]			
BOD - primary treatment (a)	0.292	0.319	0.027
BOD - corrosion component (b)	0.155	0.154	0.001
BOD - secondary and tertiary STPs[1]			
BOD - secondary/tertiary treatment (a)	1.349	1.574	0.225
BOD - corrosion component (b)	0.155	0.154	0.001
SS - primary STPs	0.423	0.450	0.027
SS - secondary and tertiary STPs	0.915	1.027	0.112
Grease - primary STPs	0.382	0.409	0.027

Grease - secondary and tertiary STPs	0.950	1.063	0.113
Nitrogen - tertiary	1.066	1.177	0.111
Phosphorous - tertiary	1.247	1.359	0.112

Notes:

[1] Price calculation: a + [b x(BODmg/L)/600]

[2] per kg of mass above domestic equivalent

Table 5-9 shows updated pollutant charges for commercial customers, with most charges having a very minor reduction compared to our July 2019 Proposal. The two most significant changes are for equipment hire wash and the BOD charge for non-compliant Waste Safe customers, with reductions of $1.334 and $0.277 respectively.

Table 5-9 Pollutant charges for commercial customers ($2019–20)

Commercial pollutant charges (per kL)	July 2019 Proposal 2020–21	November Update 2020–21	Variance 2020–21
Low strength BOD food	1.692	1.710	0.018
Higher strength BOD food	2.326	2.366	0.040
Automotive	0.481	0.486	0.005
Laundry	0.403	0.402	-0.001
Lithographic	0.277	0.281	0.004
Equipment hire wash	4.148	2.814	-1.334
Low and high strength BOD food if pre-treatment is not properly maintained	13.283	13.006	-0.277

6 Bill impact and affordability

Key messages

- The likelihood that drought will continue means our bills will go up in the next price period, to cover our increased expenditure to improve water supply system resilience and security.
- We have used IPART's latest published WACC of 3.8%. This gives a more likely illustration of bills from July 2020.
- Assuming drought continues, a bill for a typical residential customer will increase by 2.5% to $1,228 ($2019–20) from 2020–21.
- This assumes the continued operation of the desalination plant and Shoalhaven transfers, increased expenditure to improve the resilience of our system, the pass-through of costs for new Sydney Water drought measures and a revenue adjustment for restrictions.
- If drought deepens and more drought measures are needed, bills will increase further. Exact bill impacts are unknown at this stage, as they will depend on government decisions and the costs of an expanded desalination plant.
- Non-residential customers will experience a range of bill impacts, depending on their meter size, discharge factor and water use.
- Our estimated bill impacts do not include bill reductions for lower water use during restrictions. Customers can offset bill increases by using less water, as they respond to water restrictions and make voluntary indoor savings. For example, a customer who reduces their water use by 20% can save around $100 a year.
- A range of other factors could change customer bills over 2020–24 including the WACC IPART will use to calculate prices.
- If drought ends, we will no longer need to pass through the costs of water restrictions or the operation of the desalination plant.
- We have extensive customer assistance programs to support customers who experience payment difficulties. We will continue to work with government to help minimise the impact of bill increases on customers experiencing financial hardship and pensioners.

6.1 Overview of bill impacts

Changes in prices are reflected in customers' bills, which are a product of prices and consumption. Chapter 5 includes our updated base prices and indicative price increases that would apply during drought, reflecting our updated base revenue requirement and proposed cost pass-through forecasts outlined in Chapter 2. Our bill impacts assume prices based on IPART's latest published Weighted Average Cost of Capital (WACC) of 3.8%.

6.2 Bill impacts for customers

6.2.1 Base bill impacts for customers

Table 6-1 illustrates base bill impacts for different types of residential water users when compared to 2019-20, in real terms, under a non-drought scenario. Considering the impact of our updated base prices only, a typical residential customer would see a 3.2% decrease in 2020–21 for water and wastewater bills. Bills would then stay constant in real terms to 2023–24.

Table 6-1 Real residential base water and wastewater bill impacts, assuming non-drought scenario ($/year, $2019–20)

	CPI =1.3%	November 2019 Update			
	2019–20[1]	2020–21	2021–22	2022–23	2023–24
Water and wastewater					
160 kL/year (typical apartment)	1,036	998	998	998	998
Annual change		*-3.6%*	*0.0%*	*0.0%*	*0.0%*
200 kL/year	1,120	1,082	1,082	1,082	1,082
Annual change		*-3.4%*	*0.0%*	*0.0%*	*0.0%*
220 kL/year (typical house)	1,162	1,125	1,125	1,125	1,125
Annual change		*-3.2%*	*0.0%*	*0.0%*	*0.0%*
350 kL/year	1,436	1,399	1,399	1,399	1,399
Annual change		*-2.6%*	*0.0%*	*0.0%*	*0.0%*

Notes: This bill impact assessment excludes the potential volume reduction to water demand from the imposition of restrictions and the potential impact from the revenue adjustment from applying our proposed Demand Revenue Adjustment Mechanism.

[1] 2019–20 base prices do not include the pass-through of costs for the operation of the existing desalination plant or Shoalhaven transfers.

Base bill impacts for non-residential customers will depend on their meter size, discharge factors and water use.[55] We have done a preliminary assessment of some common types of non-residential customers. Considering the impact of our updated base prices only:

- most small businesses will experience a similar reduction as a typical residential apartment, due to their similar water use and wastewater discharge
- non-residential customers with larger meter sizes and relatively low water usage will experience a bill decrease of about 0.5% in 2020–21
- non-residential customers with larger meter sizes and relatively high water use, will see a bill saving of about 12% in 2020–21, similar to the level of bill savings that we proposed in July 2019. This is mainly driven by our proposed reduction in wastewater usage charges.

[55] As noted in our Price Proposal, there is no 'typical' non-residential customer.

6.2.2 Bill impacts including drought cost pass-throughs

If IPART accepts our proposals (for both costs and mechanisms), residential bills from 2020–21 will be higher. Bills will also likely increase from any third-party drought costs that are passed through to Sydney Water.

Figure 6-1 shows the impact to a typical household bill of:

- passing through the additional drought costs and applying the revenue adjustment mechanism we have proposed, based on the indicative pass-through values shown in section 5.3 (shown in yellow)[56]
- potential further bill increases from the pass-through of third-party drought costs, where exact costs are unknown (shown in grey).

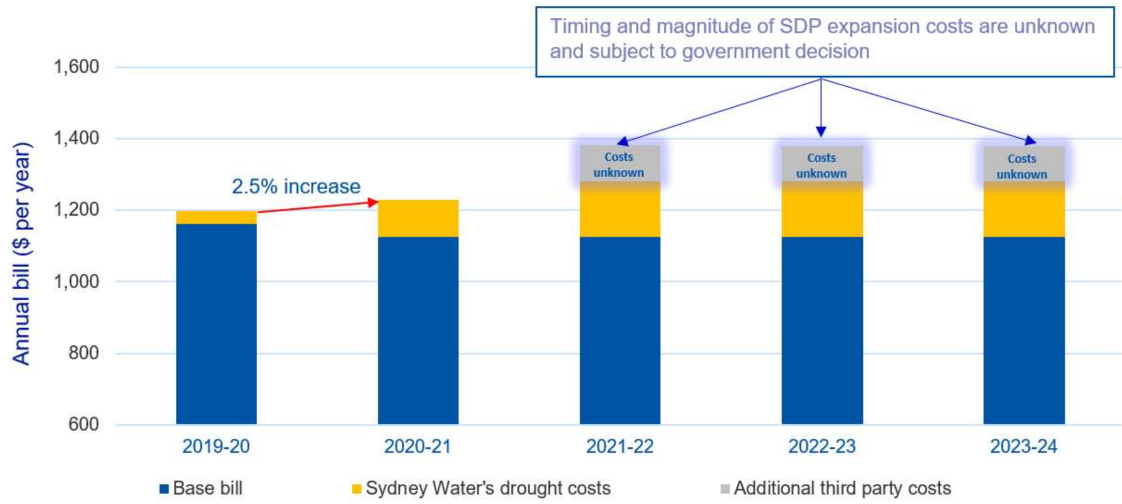


Figure 6-1 Real residential bill impact, showing drought costs (assuming unrestricted consumption of 220kL/year)

Assuming drought continues, the bill for a typical single house residential customer will:

- increase by 2.5%, or $30 a year, in 2020–21 to $1,228 ($2019–20) compared to 2019–20, based on our updated base bill and all our proposed pass-through costs
- increase by a larger amount when including third-party drought costs. This would be primarily driven by a government decision to proceed with the expansion of the desalination plant. The timing and magnitude of this cost is uncertain. Third-party costs will be determined by IPART before being passed through to our bills.

[56] Pass-through costs assumed for water conservation show the mid-point case of $23 a year, reflecting dam levels at 40-30% through 2020–24. If dam levels fell below 30%, an additional $5 a year would be recovered from customers for water conservation costs. Adjustments made for revenue recovery are based on the restricted demand scenario outlined in Appendix 3. If larger demand reductions occur, a larger annual adjustment would be required for revenue recovery.

Considering the impact of drought cost pass-throughs on different types of non-residential customers:

- most small businesses will experience a similar bill increase as a typical residential apartment
- non-residential customers with larger meter sizes and relatively low water use will experience a bill increase of about 6.5% in 2020–21
- non-residential customers with larger meter sizes and relatively higher water use we will experience a bill saving of 9%. Like the bill impact from base prices, this is mainly driven by our proposed reduction in wastewater usage charges.

Actual bill impacts in 2020–24 will depend on a range of factors, including the WACC used by IPART, and how much customers choose to save water.

6.2.3 Customers can reduce their bills by saving water

Customers can reduce the bill impacts of drought by saving water, while also helping us to reduce our costs of supply.

For comparative purposes, the bill impact shown in Figure 6-1 assumed an unrestricted typical household demand of 220kL/year. However, we expect that most customers will respond to restrictions and campaigns encouraging them to save water during the drought.

The amount a customer can save will depend on how much they reduce their water use (see Figure 6-2).

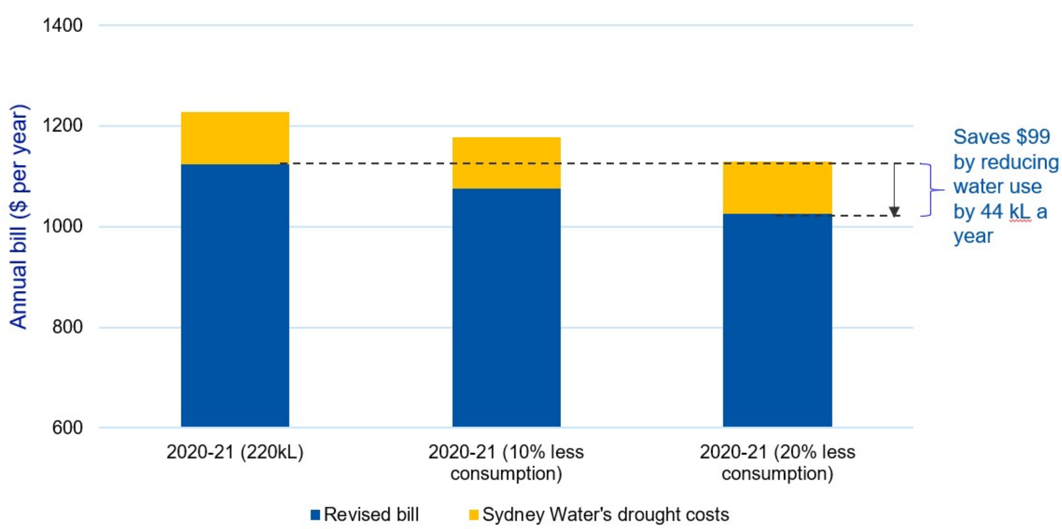


Figure 6-2 Real residential bill impact, showing drought costs and impact of saving water (compared to unrestricted consumption of 220kL/year)

Figure 6-2 shows that a typical household that:

- reduces their water use by 10% will save around $50 a year
- reduces their water use by 20% will save around $100 a year.

6.2.4 Contributing factors to bill impacts

Figure 6-3 shows contributing factors of bill impact changes for a typical household from 2019–20, to our July 2019 Proposal to this Update.

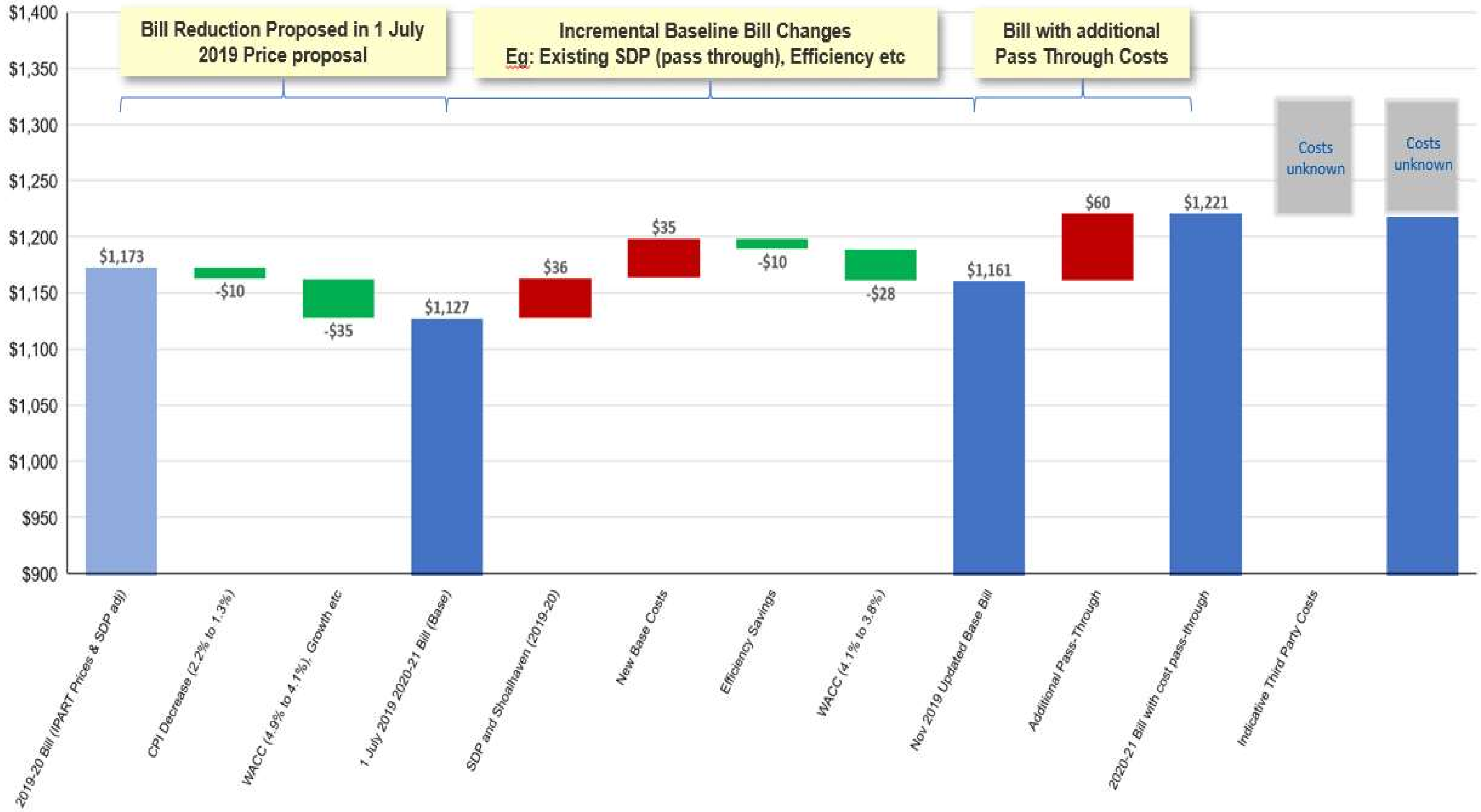


Figure 6-3 Contributing factors for changes to bills

Figure 6-3 shows that the lower assumed WACC of 3.8% in 2020 compared to the WACC of 4.9% used in 2016. Bill savings from efficiency savings, higher growth and the lower WACC largely offset bill increases due to expenditure changes. The impact of third-party costs is currently uncertain; however, this impact is likely to be larger than our proposed Sydney Water drought cost pass-throughs.

6.3 Affordability

We are aware of the impact of bills on our customers. We recognise that real bill increases will make our services less affordable. In addition to the savings in our July 2019 Proposal, we have set ourselves more demanding efficiency targets to save costs, to limit the scope of bill increases on customers. The further $89 million of savings we have proposed makes a total of $193 million in operating costs that we have excluded from prices and bills. As a whole, our operating expenditure proposal is 4.6% lower than it would have been without these savings.

Our risk-sharing approach to funding growth in our July 2019 Proposal means that we only ask customers to fund upfront the costs of development that we are certain will occur. This avoids customers paying for the costs of growth that may not eventuate.

If IPART determines a lower WACC in 2020 than their current published WACC, this will also place further downward pressure on bills.

Despite these measures, we are aware that some customers can still experience payment difficulty. We have an extensive range of options to help customers experiencing hardship, including:

- payment extensions – increasing the time that eligible customers have to pay accounts
- payment plans – providing customers with the option of entering into an instalment plan
- Centrepay – regular deductions direct from customers' Centrelink benefits
- financial counselling – referral to qualified financial counsellors for individual financial assessments and help with budgeting
- BillAssist – personalised management of customers in debt with reviews and referrals to support services within local areas.

These programs are described in our July 2019 Proposal. Financial assistance for customers experiencing payment difficulty is funded by the NSW Government.

We also apply pensioner concessions to bills for residential properties.[57] Currently, pensioners receive:

- a 100% rebate on the water service charge[58]

[57] Eligibility criteria for pensioner concessions are described on our website at: http://www.sydneywater.com.au/SW/accounts-billing/paying-your-bill/pension-rebates/index.htm.
[58] Up to a maximum of $24.30 a quarter. This is set to reflect the typical service charge for a metered residential property.

- an 80% rebate on the wastewater service charge
- a 50% rebate on the stormwater service charge.

Pensioner concessions are funded by the NSW Government. The rebate levels are typically adjusted after each price determination. Our long-standing policy on pensioner concessions has been to keep pensioner bills at parity with non-pensioner bills when prices are re-set by IPART. That is, pensioner bills should increase or decrease by a similar percentage to the bill for a typical residential household.

We will continue to work with the government to support pensioners and customers experiencing payment difficulty.

7 Financeability

Key messages

- To ensure we can serve our customers, we must remain a financially viable business. This viability may be challenged in the next period, as we plan to both increase our capital investment, while we face challenges to our revenue recovery, as water demand is likely to be well below our forecast if drought continues.
- Our analysis shows that providing we recover additional costs and revenue losses due to drought through our one-year lag mechanism, there are some minor breaches to our required financial metrics, assuming a Weighted Average Cost of Capital of 3.8%.
- If the core elements of our Proposal are not accepted by IPART, our financial metrics look worse. It is essential that we are able to recover additional costs associated with drought and that we are protected against the possibility of excessive reductions in our revenue due to water restrictions. We do not control the imposition of water restrictions nor can we forecast with certainty the extent or duration of drought.
- If the WACC falls to much lower levels, such as the 3.2% forecast by Hunter Water, we forecast severe breaches in key financial metrics. If the Weighted Average Cost of Capital falls to much lower levels, such as the 3.2% forecast by Hunter Water, we forecast severe breaches in key financial metrics. We would be concerned if the consequence of IPART's prices is an inappropriate return to our shareholder.
- We propose to work with IPART to ensure that prices are set in a financially sustainable manner. IPART should apply discretion when selecting our Weighted Average Cost of Capital point estimate, and address risks associated with drought through well-designed regulatory mechanisms. Other adjustments may also be necessary.

7.1 Overview

Even with the measures we have proposed to manage revenue shortfalls and the costs of drought, our revised proposal will likely result in breaches of IPART's benchmark and actual financeability metrics in each year of the 2020–24 price period.

Our modelling results assume a Weighted Average Cost of Capital (WACC) of 3.8%.[59] However, Hunter Water has forecast that the WACC could be 3.2% in April 2020 if current financial market conditions continue.[60] If the WACC falls to 3.2% or if we are unable to recover additional costs and revenue shortfalls due to drought with mechanisms such as those we propose in Chapter 3, this would result in a further deterioration in our metrics.

[59] IPART, WACC Biannual Update, August 2019, p. 5.
[60] Hunter Water, Response to IPART Issues Paper, October 2019, p. 18.

IPART may need to consider remedies to ensure that prices strike the appropriate balance between:

- affordability for our customers
- maintaining our financial and operational resilience to drought.

7.2 Our financeability

This section sets out our forecast financial position under our Update, which assumes:

- a scenario where drought conditions continue
- IPART provides us with mechanisms to recover additional costs and revenue shortfall as outlined in Chapter 3
- a WACC of 3.8%.

Except for water conservation, the annual costs of the drought response measures we propose remain fairly constant once triggered. However, the impact of demand reductions is more uncertain and can have a larger impact on cash flows. We have used a different restricted demand scenario for our financeability assessment, with more varied and larger reductions in demand, than the scenario used to demonstrate indicative price and bill impacts in Chapters 5 and 6.

7.2.1 Results under IPART's tests

Tables 7-1 and 7-2 set out the results of IPART's benchmark and actual tests, respectively. We forecast that our FFO/Net Debt will fall below the target in both the benchmark test and the actual test. The metrics show improvements in each year as, over time, our proposed Demand Revenue Adjustment Mechanism operates to recover most of the revenue that would otherwise be lost because of restrictions.

The metrics under the actual test appear worse than under the benchmark test because we primarily fund our business with nominal debt. We use nominal debt as the market for inflation-linked instruments in Australia is thin.

We identify reasons for the breaches in section 7.2.3.

Table 7-1 IPART benchmark financeability test results

Ratio	Target	2020–21	2021–22	2022–23	2023–24
Real interest coverage ratio	>2.2x	3.0x	3.0x	3.1x	3.2x
Net Debt/RAB	<70%	60%	60%	60%	60%
FFO/Net Debt	>7%	5.5%	5.6%	5.9%	6.2%

Table 7-2 IPART actual financeability test results

Ratio	Target	2020–21	2021–22	2022–23	2023–24
FFO Interest Coverage	>1.8x	2.5x	2.4x	2.5x	2.4x
Net Debt/RAB	<70%	55%	55%	55%	55%
FFO/Net Debt	>6%	5.5%	5.5%	5.8%	5.9%

We view these results as an early indicator that some aspects of the IPART framework, including the WACC method, may cause financeability issues for us. We propose actions in section 7.2.4.

7.2.2 Our forecast position under Moody's methodology

We have forecast our financial position using Moody's metrics. These metrics are useful to forecast possible implications of IPART's pricing decisions for our credit rating, noting that Moody's weighs 40% of their assessment using these metrics and 60% on qualitative factors.[61] Our analysis using the Moody's metrics is set out in Table 7-3 below.

Similar to the results using the IPART financeability test, the Moody's metrics show FFO/Net Debt breaches in years one and two of 2020-24 price period, before improving in the final two years.

Importantly, the Moody's analysis indicates that there could be implications for our credit rating if other actions to improve our financeability are not taken. We propose remedial actions in section 7.2.4

Table 7-3 Projections of Moody's credit rating ratios

Ratio	2020–21	2021–22	2022–23	2023–24
FFO Interest Coverage	2.3x	2.5x	2.5x	2.5x
Net Debt/RAB	62%	63%	62%	63%
FFO/Net Debt	4.8%	5.4%	5.5%	5.6%
RCF/Net Debt	2.7%	3.8%	4.2%	4.3%
Rating	Baa3	Baa2	Baa2	Baa2

7.2.3 Cause of breaches

The key factors driving the metric breaches are our exposure to drought risks and the low regulatory rate of return resulting from IPART's WACC method:

- While we propose mechanisms to mitigate drought risks, we have designed them so that a portion of the risk remains with us, instead of passing the entire risk onto our customers.

[61] Moody's also considers Stability and Predictability of Regulatory Environment (15%), Cost and Investment Recovery - Sufficiency & Timeliness (15%), Scale and Complexity of Capital Programme (10%) and Revenue Risk (5%). See Moody's, Rating methodology – Regulated water utilities, June 2018.

This is because we have designed our mechanisms with a materiality threshold (>5% variance to forecast) and a one-year lag in the pass-through.

- IPART's WACC method currently produces a WACC value (3.8%) that is 90 basis points lower than the WACC determined by IPART in 2016. At this level, revenue is insufficient to meet key financial metrics, even with a well-designed mechanism to mitigate drought risk.

We note that IPART considers other possible causes for our financeability concerns in its Issues Paper:

> *Our view is that the NSW Government's policy of zero developer charges together with Sydney Water's proposal to underfund its growth capital expenditure program could have a larger impact on its financeability and the return it delivers to its shareholder (Treasury)…If this growth expenditure is required, it would be unfunded over the next four-year pricing period, which could have a large impact on its cash flow and returns to its shareholder*.[62]

We disagree with the reasons cited by IPART as the causes of our financeability concerns:

- **Developer charges:** The government's decision to set water and wastewater developer charges to zero is not relevant to this assessment. Zero developer charges for water and wastewater is a stated policy of the NSW Government and is not controlled by Sydney Water.
- **Growth capital expenditure:** As noted in our July 2019 proposal, "our approach meant that we accepted the risk of covering the financing costs if this less certain development did occur, and new assets were required".[63] IPART similarly recognised that it is 'not certain it will be required'.[64] This approach may therefore have no material impact on our finances and even if it does, its impact is likely to be modest. Its impact is not material relative to the financeability challenges we identify here.

7.2.4 Proposed actions

Apply judgment when selecting the WACC point estimate

We maintain our position that judgment should be used when selecting a point estimate WACC from within the range, rather than relying on a mechanical application of the WACC method.[65] IPART's WACC model has well-established downward biases and we are concerned that if IPART applies its WACC method without exercising judgment, our credit rating metrics may breach an investment grade credit rating.

Our analysis in Table 7-4 demonstrates that if the trend in market conditions continues and the WACC falls to 3.2% under IPART's method, the implied credit rating using Moody's quantitative metrics could be as low as Ba1, which is below investment grade. If IPART adopts the WACC method without adjustment, it will understate the cost of equity because of the bias in the SL

[62] IPART Issues Paper, p 58.
[63] Sydney Water Price Proposal 2020–24, July 2019, Attachment 9: Capital expenditure, p. 38.
[64] IPART Issues Paper, p 58.
[65] Sydney Water Price Proposal 2020–24, Attachment 6: Weighted average cost of capital, June 2019, pp. 7–10; Sydney Water, Response to Issues Paper, October 2019, p. 30.

CAPM. If our credit rating is not sustainable due to IPART's pricing determination and our credit rating is downgraded, this understatement in the cost of equity will likely flow through to an understatement in the actual cost of debt due to higher funding costs in debt markets following a rating downgrade to less than investment grade.

We appreciate that IPART, in its Issues Paper, recognised that it will need to "select a WACC estimate that allows a benchmark efficient business to remain financeable". However, if IPART applies its WACC method without exercising judgment, we are concerned the resulting prices may give inadequate weight to certain matters in section 15 of the IPART Act, namely:

- 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[66]
- 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.[67]

In the past, IPART has adjusted the regulatory WACC to address financeability concerns. For example, in 2014, IPART adjusted the gearing assumption within the WACC estimation from 60% to 55%, effectively raising the WACC to a financially sustainable level. IPART also proposed that shareholders contribute an equity injection to match the lower gearing level.[68]

Appropriate share of drought risks

Without our mechanisms to mitigate some risks associated with drought, the implied credit rating using Moody's quantitative metrics also falls below investment grade (see Table 7-4). We consider this analysis demonstrates the importance of allowing well-designed drought risk mechanisms.

Other remedies

IPART may need to explore additional remedies to our financeability concerns to ensure that prices strike the appropriate balance between affordability and financeability. IPART has identified several options in its financeability decision including reassessing the pricing decision or NPV neutral adjustments to prices.[69]

7.3 Impacts of drought and Weighted Average Cost of Capital of 3.2%

We have forecast financeability using Moody's quantitative metrics under three scenarios as shown in Table 7-4. If the WACC falls to 3.2% or we are not provided with well-designed mechanisms to mitigate drought risk, we forecast severe breaches of the metrics.[70]

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[66] IPART Act, section 15 (c).
[67] IPART Act, section 15 (g).
[68] IPART, Essential Energy's water and sewerage services in Broken Hill, June 2014, pp. 13,142.
[69] IPART, Review of our financeability test – Final Report, November 2018, p. 63.
[70] Note that Moody's places weight on qualitative factors as well as these metrics.

Table 7-4 Projections of Moody's credit rating ratios

Ratio	2020–21	2021–22	2022–23	2023–24
Scenario 1 – Without our drought mechanisms and a WACC of 3.8%				
FFO Interest Coverage	2.1x	2.1x	1.9x	1.9x
Net Debt/RAB	63%	64%	64%	65%
FFO/Net Debt	4.0%	3.6%	3.3%	3.2%
RCF/Net Debt	3.0%	3.6%	3.3%	3.2%
Rating	Ba2	Ba2	Ba2	Ba2
Scenario 2 – With our drought mechanisms and a WACC of 3.2%				
FFO Interest Coverage	2.1x	2.5x	2.5x	2.4x
Net Debt/RAB	63%	63%	63%	63%
FFO/Net Debt	4.1%	4.7%	4.9%	5.0%
RCF/Net Debt	2.0%	3.5%	3.9%	4.0%
Rating	Ba1	Baa3	Baa3	Baa2
Scenario 3 – Without our drought mechanisms and a WACC of 3.2%				
FFO Interest Coverage	1.9x	1.9x	1.8x	1.8x
Net Debt/RAB	63%	64%	65%	66%
FFO/Net Debt	3.3%	3.1%	2.8%	2.7%
RCF/Net Debt	2.3%	3.1%	2.8%	2.7%
Rating	Ba2	Ba2	Ba2	Ba2

8 Appendices

8.1 Appendix 1 Water conservation expenditure

8.1.1 Funding water conservation via a cost pass-through

In our July 2019 Proposal, we requested a water conservation program budget of $10 million a year. This base program will comprise ongoing projects including research and development and pilots. We also identified that, in line with our Operating Licence requirements and applying the Economic Level of Water Conservation (ELWC) methodology, we would need to increase our expenditure on water conservation as dam levels fall and the value of water increases. However, there is a tension between the uncertainty of future dam levels, our Operating Licence requirement to undertake water conservation, and how to efficiently fund water conservation in light of this uncertainty.

Therefore, as outlined in sections 2.3.2 and Chapter 3, we consider that our water conservation efforts can be funded efficiently via IPART's existing cost pass-through framework. This appendix outlines our approach to determining our updated water conservation expenditure forecast to apply as part of the framework.

Under the ELWC methodology we can estimate the theoretical maximum economic spend given the relevant value of water (VoW) for lower dam levels, and the water saved by our past water conservation programs.[71] We have estimated points on the marginal cost curve for our water conservation program at dam levels of 50%, 40% and 30% (as they correspond to restriction levels in the 2017 Metropolitan Water Plan), capped at the relevant VoW. For these points we have estimated the maximum economic expenditures, incremental to the $10 million base request:

- 50% dam level, $40 million
- 40% dam level, $70 million
- 30% dam level, $90 million.

There is a lack of cost information for our water conservation programs (and within Australia more broadly), particularly for the dam levels assumed to occur during drought over 2020-24. Therefore we propose to benchmark the above maximum economic expenditures against water conservation costs of utilities in England and Wales. Based on this we have estimated efficient levels of expenditure for each dam level:

- 50% dam level, $33 million
- 40% dam level, $51 million
- 30% dam level, $62 million.

[71] Determining Sydney Water's Economic Level of Water Conservation. Part A: The ELWC Methodology. Sydney Water, July 2018.

8.1.2 The economic and regulatory framework

This section outlines the economic and regulatory frameworks within which we determine the efficiency of our water conservation expenditure requests. We assess the reasonableness of our expenditure amounts via a simple benchmarking analysis.

The water conservation marginal cost curve and the ELWC methodology

The results of the ELWC methodology rely on a clear understanding of the marginal cost curve of water conservation programs as dam levels decline.

For dam levels which occur most often, about 80% to 70%, we have enough data to be able to reasonably assess the marginal cost of our program. However, as dam levels drop below 50%, the change in our marginal cost curve is unclear. This is because of diminishing returns to our water conservation effort.

This benchmarking helps to determine if the underlying marginal cost curve derived from the theoretical maximum economic expenditures produced under the ELWC methodology, is efficient: is the marginal cost curve too steep or too flat? What are the inferred returns to scale - diminishing, increasing or constant? In this way we maximise the likelihood that our customers will only pay for water conservation that is efficient.

Using the ELWC framework we can graphically demonstrate the issue we are trying to address for different marginal cost curves and VoWs.

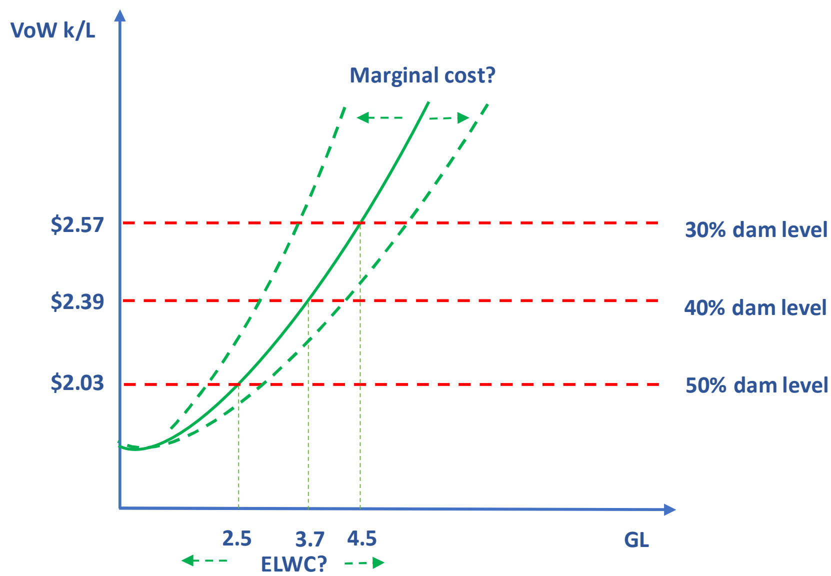

Figure 8-1 Varying marginal cost curves and ELWC quantities

The case for diminishing returns

The marginal costs assumed in the ELWC example above, and within the methodology assume a diminishing return. Expenditure on water conservation exhibits diminishing returns when the levelised cost per unit of water conserved increases as greater volumes are conserved.[72] In practice this means that if implementing a small water conservation program (generally correlating with a new program), a company would choose to first implement a program of the most cost-effective programs available — it would pick the lowest-hanging fruit first. As long as it requires the same total volume of water conservation, it should continue to optimise between existing water conservation programs to deliver at the lowest cost.

However, if it needs to conserve a larger volume of water, say as dam levels decline rapidly, the potential of the cheapest programs may be exhausted. It will need to move on to the higher cost (per unit of water conserved) programs. Therefore, if there are diminishing returns to conservation, larger programs will have higher costs per unit of water conserved than those proposing smaller programs. Similarly, we would expect that as total water conservation costs are increasing faster than volumes conserved, there is a diminishing return, ie the total cost curve is convex as assumed in Figure 8-1.

We seek to confirm this assumption at a high level in our analysis.

Simple regression analysis (yardstick benchmarking)

We use simple yardstick benchmarking in our analysis. Benchmarking is a common technique used in regulation in Australian[73] and globally[74] which "…*establishes a point of reference against which items in production can be assessed for their fitness or performance. The term has been used in the context of price regulation to describe different objectives, including identifying the most efficient firm in a sector, or alternatively indicating the price that would be charged for some particular product or service in a competitive market.*"[75]

As with most statistical approaches, it is an imperfect technique, particularly when there is limited data or ability to control for all factors driving cost or price. For example, the Productivity Commission has noted, the costs of providing water are influenced by many factors, all of which interact at the same time and across time.[76] A common concern with simple benchmarking is that many of these factors that impact the quanta of cost or difference in the quality of services provided are outside a utility's control. Controlling for these factors is necessary, but only possible where the differences can be identified and measured across the sample of businesses used in benchmarking.[77] We consider that this limitation should not preclude the high level use of simple regression techniques, as long as the degree of error is acknowledged and that discretion needs to be applied in interpreting results.

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72 The levelised cost of a program is its cost divided by the total volume of water it conserves across all years.
73 See for example, Trevor Breusch (2011), Review of benchmarking activity domestic transmission capacity service; Mike Smart (2010), International benchmarking of Australian wholesale transmission capacity – Public version.
74 See for example, Robert Baldwin and Martin Cave, Understanding Regulation: Theory, Strategy, and Practice New York: Oxford University Press, 1999, Chapter 18.
75 Trevor Breusch (2011), Review of benchmarking activity domestic transmission capacity service, page 8.
76 Productivity Commission (2011), Australia's Urban Water Sector, Inquiry Report, No. 55, Volume 1, p16.
77 However, accounting for so many possible factors is impractical due to requiring significant input data. Previous benchmarking techniques regularly control for variables only one at a time, and do not detect significant dynamics a firm experience. These analyses fail to satisfy the basic needs for an appropriate benchmarking analysis, invalidating detailed conclusions drawn from them.

8.1.3 Data

Two data sources were relied on for our benchmarking analysis:

- our internal information
- publicly available water conservation expenditures of English and Welsh water utilities.

Our initial water conservation expenditure requests ($40 million, $70 million and $90 million) were based on internal estimates (based on past program costs) of delivering expanded programs as the VoW increased. Table 8-1 summarises the data we generated following this approach.

Table 8-1 Sydney Water generated expenditures ($2019–20)

Dam level	50%		40%		30%	
Program	Water Conserved (ML/yr)	Forecast ($) per annum	Water Conserved (ML/yr)	Forecast ($) per annum	Water Conserved (ML/yr)	Forecast ($) per annum
Waterfix Residential						
Showers	390	5,062,500	496	8,482,500	562	10,762,500
Toilets	260	3,375,000	331	5,655,000	374	7,175,000
Taps	130	1,687,500	165	2,827,500	187	3,587,500
Other	130	1,687,500	165	2,827,500	187	3,587,500
Washing Machines	195	2,531,250	248	4,241,250	281	5,381,250
Outdoor	195	2,531,250	248	4,241,250	281	5,381,250
Waterfix strata	680	7,225,000	805	12,325,000	911	15,725,000
Business to business	420	2,000,000	536	5,600,000	607	8,000,000
Waterfix commercial	300	2,800,000	358	5,200,000	405	6,800,000
Leak reduction	300	4,000,000	447	7,000,000	506	9,000,000
Administrative cost		7,100,000		11,600,000		14,600,000
Total	**3000**	**40,000,000**	**3799**	**70,000,000**	**4301**	**90,000,000**
Per property	**5.26 L/d**	**$ 25.24**	**6.97 L/d**	**$ 40.39**	**7.61 L/d**	**$ 50.48**

Note: total number of properties 1,980,838.

The information in Table 8-1 was derived assuming:

- program benefits continue to accrue over a period of 10 years
- pre-tax Weighted Average Cost of Capital (WACC) of 5.9%
- 1,980,838 properties are currently connected to Sydney Water.
- dam levels of 50%, 40% and 30%, with corresponding values of water at $2.03, $2.39 and $2.57 k/L
- programs begin before the value of water is expected to be reached, as they need to ramp up to be online before relevant dam levels are reached

Our proposed water conservation expenditures include subsidies for the demand-reducing Waterfix programs. By subsidising these programs, we reduce their cost to our customers, encouraging and increasing take-up. As dam levels decrease, we increase the subsidy on each unit, further lowering the cost to customers and incentivising even greater take-up. However, this translates to a higher cost for us, and an increasing cost on each unit of water conserved.

We used publicly available water conservation data[78] submitted by English and Welsh utilities to Ofwat at the 2019 price review. 14 of 17 companies submitted water conservation plans, which include leakage reduction and other demand-side enhancements.

Using these forecasts, we estimated total costs and benefit per property of each proposal in 2019-20 dollars.[79] We convert these costs to $AUD using current day (1.89) GBP/AUD exchange rates. The derived values for these utilities are contained in Table 8-2.

Table 8-2 English and Welsh utility water conservation business plans

Utility	Utility	Total Cost per property ($m, 2019-20)	Number of Properties (000s)	Total Benefit per Property (l/d)
Affinity Water	AFW	$109.5	1613	36.6
Bristol Water	BRL	$13.4	577	11.6
Northumbrian Water	NWT	$21.5	3476	19.3
Portsmouth Water	PRT	$8.4	335	14.1
South East Water	SEW	$61.5	1079	24.7
Southern Water	SRN	$106	1194	30.4
South Staffs Water	SSC	$30.3	795	25.9
Severn Trent Water	SVE	$16.9	3768	17.5
Welsh Water	WSH	$81.3	1493	25.8
Wessex Water	WSX	$77.7	660	23.5
Yorkshire Water	YKY	$102.5	2429	28.5

[78] 2019 Price Review: Business Plans. Ofwat, September 2018: https://www.ofwat.gov.uk/regulated-companies/price-review/2019-price-review/business-plans/.
[79] Office for National Statistics (2019) Government Official Statistics: Forecasts for the UK economy: March 2019.

For the data to show whether there are diminishing returns or otherwise in a benchmarking analysis, we need the programs to be comparable. We therefore need to make two adjustments to the sample:

- we normalise companies' reported costs and conservation benefits to adjust for the scale of their network, by dividing the units of water conserved by the number of properties.[80]
- we exclude companies that are particularly different on characteristics other than the size of their program.

In this way we ensure the comparability of the programs as we are not able to control for the above factors given the available data. As we could not make the above adjustments for three companies, we have excluded:

- **Thames Water**[81] — an outlier on current and historical leakage, largely driven by a series of failings in its leakage reduction efforts since 2015, leading to an Ofwat investigation which imposed a penalty of £65m and found Thames Water had breached its licence conditions. Its current leakage levels per property are more than two standard deviations away from the sample mean. Its unique problems with leakage and leakage reduction will drive its observed water conservation costs (since leakage reduction accounts for over 80% of Thames Water's proposed water conservation expenditure), and it is unlikely to share a starting point along the conservation cost curve with the rest of the sample
- **Anglian Water**[82] — Anglian Water is likely to have a different starting level of water conservation to other utilities; the region was already classed as under "severe water stress" when it began its last planning period in 2015. In its draft determination, Ofwat subjected Anglian Water's expenditure request to an especially large reduction, higher than any other company
- **SES Water**[83] — Water mains replacement accounts for around 85% of SES Water's leakage-reduction investment (75% of SES Water's overall demand-side water conservation costs). SES Water states that this expenditure will "sustainably reduce leakage for the long-term", meaning is associated with long-run benefits (ie leakage avoided after 2025) which we cannot quantify.

Naturally, differences between the utilities in the data set remain. An important difference is that of leakage reduction, the greatest component of the English and Welsh conservation programs. We have achieved a lower level of leakage than all the English and Welsh water companies. This suggests we have already achieved many of the reductions now sought by them, and therefore

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[80] If we did not make this normalisation we would effectively estimate the economies to scale of running a larger network as opposed to the returns of increasing penetration of water conservation programs.
[81] *Our 5 year plan for 2020 to 2025*. Thames Water, September 2018: https://www.thameswater.co.uk/-/media/Site-Content/Thames-Water/Corporate/AboutUs/Our-strategies-and-plans/PR19/Our-plan-2020-to-2025.pdf
[82] *Our plan 2020 to 2025*. Anglian Water, September 2018: https://www.anglianwater.co.uk/siteassets/household/about-us/01-pr19-our-plan-2020-2025.pdf
[83] *Our business plan 2020 to 2025*. SES Water, September 2018: https://www.waterplc.com/userfiles/file/Our%20Business%20Plan%20for%202020%20to%202025.pdf

has a starting point further along the cost curve. With diminishing returns to water conservation, we would therefore expect the cost of our additional conservation measures to be higher than those of English and Welsh companies, all else being equal.

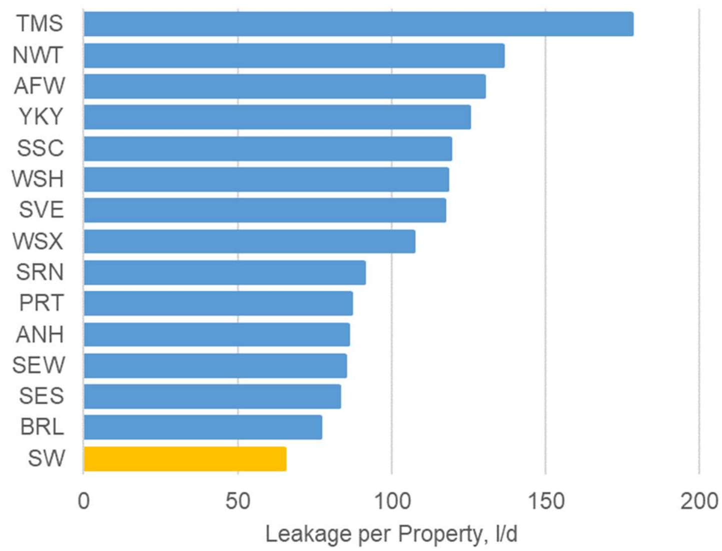

Figure 8-2 Leakage per property, Sydney Water and England and Wales

An implication of different historical levels of water conservation is that the level of English and Welsh water conservation costs are likely an inappropriate direct benchmark for the level of our costs because of our more advanced starting point along the cost curve. However, the degree to which these returns to water conservation are diminishing ie the general slope of the total or marginal cost curve, may still be informative about the degree of diminishing returns we should expect for our projects. We keep this underlying caveat of the data in mind when conducting our analysis.

8.1.4 Analysis and results

Our benchmarking approach is to fit a simple regression line for the data and assess where our proposed expenditures lie; total cost per property against total benefit per property (litres of water conserved). The primary purpose is to cross-check the level of proposed expenditure but also the diminishing returns in our water conservation program. We illustrate the benchmarking results in Figure 8-3 based on two broad assumptions:

- zero intercept — a water conservation package that conserves 0 litres per day will cost $0
- 95% confidence interval — data falling within the interval is statistically equivalent to points on the regression line (allowing for uncontrolled variation with a simple regression).

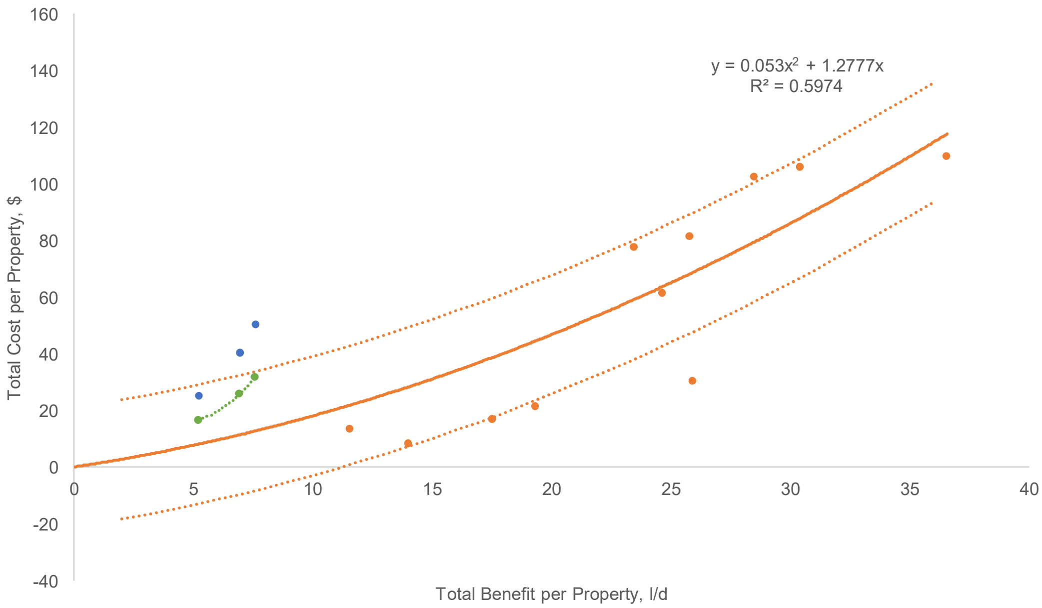

Figure 8-3 Benchmarking data and method

The results show:

- English and Welsh utilities (orange dots) display diminishing returns per property for water conservation
- our maximum ELWC based expenditures (blue dots):
  - display diminishing returns
  - for dam levels at 40% and 30% (upper most two blue dots), expenditures fall outside the 95% confidence interval meaning there is a degree of unexplained variation or the values are simply too high.

Our view is that given expenditures derived from the ELWC method are economic, the values are likely not too high, rather a symptom of unexplained variation in the regression. However, in such a simple benchmarking approach and with limited data for the 50%, 40% and 30% dam levels, it is difficult to resolve the issue. We therefore propose to adjust the ELWC derived expenditures downward. In this way we are sharing risks evenly between our customers and Sydney Water and are choosing final points within the 95% confidence interval.

As there is no guidance on how to make this adjustment, we have chosen to take the mid-point between the ELWC derived expenditures and the regression line (green dots).

To derive total water conservation expenditures, we multiply this per property cost by the number of properties we service. These are lower than our initial requests:

- 50% dam level, $33 million (previously $40 million excluding $10 million base)
- 40% dam level, $51 million (previously $70 million excluding $10 million base)
- 30% dam level, $62 million (previously $90 million excluding $10 million base).

Sensitivity analysis

To ensure that our results are robust to underlying assumptions we have sensitivity tested:

- different exchange rates
- removing the assumption of a zero intercept.

Exchange rates

We assumed the following for rates:

- 10 year moving average: 1.73 GBP/AUD
- 2015-16 high: 2.15 GBP/AUD
- Average of current and 2015-16 high: 2.02 GBP/AUD.

The results of exchange rate movements are presented in Table 8-3.

Table 8-3 Exchange rate sensitivity analysis

GBP/AUD	50% dam level, $33m	40% dam level, $51m	30% dam level, $61m
1.73	$33,011,000	$51,192,000	$62,443,000
1.82	$33,101,000	$51,372,000	$62,664,000
1.98	$33,301,000	$51,772,000	$63,155,000
2.15	$33,431,000	$52,032,000	$63,474,000

We find that our final forecast expenditures ($33 million, $51 million, $62 million) remain robust to changes in the exchange rate.

Relaxing a zero intercept

We relax the assumption that a water conservation program that conserves 0 liters per day will cost $0, or that we contemplate *any* hypothetical water conservation package. We do this by allowing our simple regression used above to estimate a constant for the regression. Results are illustrated in Figure 8-4.

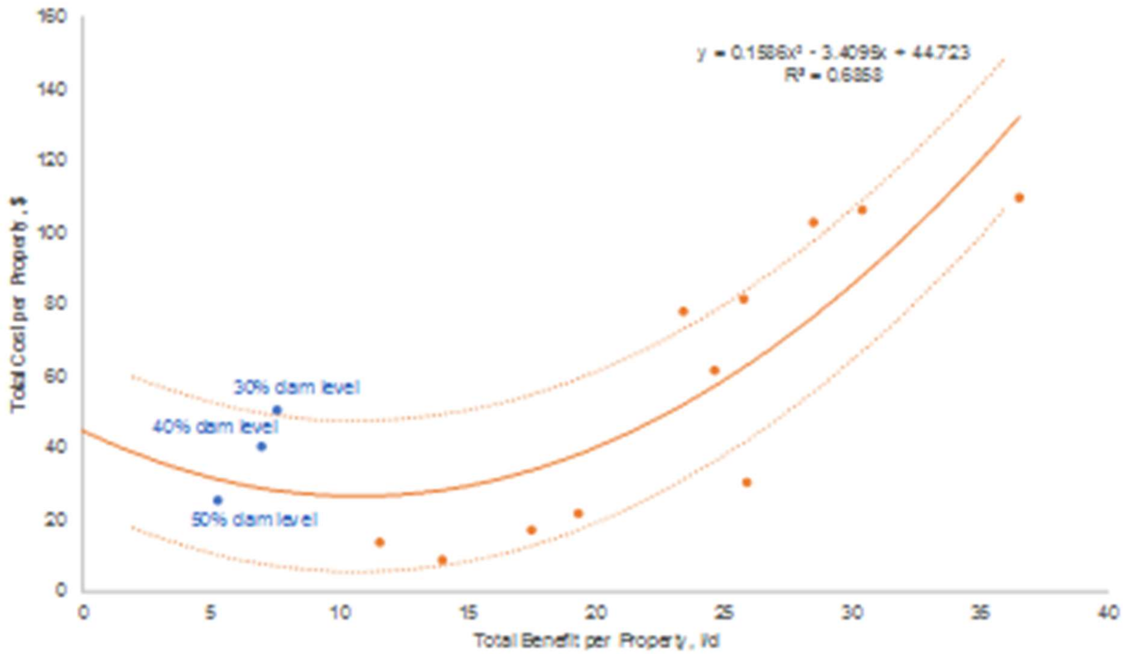

Figure 8-4 Zero intercept sensitivity analysis

Not surprisingly results are sensitive to the introduction of a constant, given that the only observation near the origin in Figure 8-4 are the ELWC derived data values. The regression implies that the ELWC derived expenditure forecasts are appropriate. However, we do not find this sensitivity test to be compelling as *a priori* it stands to reason that, all else equal, a water conservation program that conserves 0 litres per day will cost $0 per property, rather than approximately $44 (the intercept value). This level of spend for no benefit would infer a large degree of inefficiency for water conservation programs and/or a large fixed cost to possibly maintain the readiness of programs, which may be somewhat plausible however we have no clear evidence to support this view.

Conclusion

Using a simplistic regression approach, we have been able to find an efficient benchmark for water conservation forecasts based on the ELWC methodology and English and Welsh comparators.

We therefore find that the forecast expenditures for the varying dam levels above our base expenditure of $10 million per annum are efficient.

8.2 Appendix 2 Price schedules and section 12A prices

We propose service charges on a daily rate. Unless otherwise stated, the charges shown in the tables in this appendix are annual rates based on an equivalent of 365 days.

8.2.1 Price schedules 1-7

Schedule 1 Water supply services

Table 8-4 Water meter connection charge ($/year, $2019–20)

Meter Size	2020–21	2021–22	2022–23	2023–24
20 mm	97.54	97.54	97.54	97.54
25 mm	152.41	152.41	152.41	152.41
32 mm	249.71	249.71	249.71	249.71
40 mm	390.18	390.18	390.18	390.18
50 mm	609.66	609.66	609.66	609.66
80 mm	1,560.72	1,560.72	1,560.72	1,560.72
100 mm	2,438.62	2,438.62	2,438.62	2,438.62
150 mm	5,486.90	5,486.90	5,486.90	5,486.90
200 mm	9,754.49	9,754.49	9,754.49	9,754.49
For meter sizes not specified above, the following formula applies	$\frac{(\text{Meter size})^2 \times \text{20mm meter charge}}{400}$			

Note: It is assumed that Sydney Desalination Plant (SDP) is in shut-down mode and no Shoalhaven transfers.

Table 8-5 Water supply service charge for Unmetered Properties ($/year, $2019–20)

Charge	2020–21	2021–22	2022–23	2023–24
Water supply service charge	477.23	477.23	477.23	477.23

Table 8-6 Water usage charge for Filtered Water ($/kL, $2019–20)

Charge	2020–21	2021–22	2022–23	2023–24
Water usage charge	2.11	2.11	2.11	2.11
SDP uplift to water usage charge	0.13	0.13	0.13	0.13

Table 8-7 Water usage charge for Unfiltered water ($/kL, $2019–20)

Charge	2020–21	2021–22	2022–23	2023–24
Unfiltered water usage charge	1.81	1.81	1.81	1.81

Schedule 2 Wastewater supply services

Table 8-8 Wastewater usage charge for non-residential properties ($/kL, $2019–20)

Charge	2020–21	2021–22	2022–23	2023–24
Wastewater usage charge where:				
Volume of wastewater discharge ≤ discharge allowance	0.00	0.00	0.00	0.00
Volume of wastewater discharge > discharge allowance	0.61	0.61	0.61	0.61

Note: The discharge allowance is 0.411kL/day.

Table 8-9 Wastewater meter connection charge ($/year, $2019–20)

Meter Size	2020–21	2021–22	2022–23	2023–24
20 mm	628.34	628.34	628.34	628.34
25 mm	981.78	981.78	981.78	981.78
32 mm	1,608.54	1,608.54	1,608.54	1,608.54
40 mm	2,513.35	2,513.35	2,513.35	2,513.35
50 mm	3,927.11	3,927.11	3,927.11	3,927.11
80 mm	10,053.40	10,053.40	10,053.40	10,053.40
100 mm	15,708.43	15,708.43	15,708.43	15,708.43
150 mm	35,343.98	35,343.98	35,343.98	35,343.98
200 mm	62,833.73	62,833.73	62,833.73	62,833.73
For meter sizes not specified above, the following formula applies	$\frac{(\text{Meter size})^2 \times \text{20mm meter charge}}{400}$			

Note: The prices assume the application of a Discharge Factor (df) of 100%. The relevant Discharge Factor may vary from case to case, as determined by us. A pro rata adjustment shall be made where the df% is less than 100%.

Table 8-10 Deemed wastewater usage charge ($/year, $2019–20)

Charge	2020–21	2021–22	2022–23	2023–24
Deemed wastewater usage charge	91.51	91.51	91.51	91.51

Schedule 3 Stormwater drainage services

Table 8-11 Stormwater drainage service charges ($/year, $2019–20)

Property category	2020–21	2021–22	2022–23	2023–24
Residential multi premises	25.28	25.28	25.28	25.28
Residential property – low impact	25.28	25.28	25.28	25.28
Residential standalone property	80.98	80.98	80.98	80.98
Non-residential property within a non-residential multi premises	25.28	25.28	25.28	25.28
Non-residential property – small (200m^2 or less)	25.28	25.28	25.28	25.28
Non-residential property – medium (201m^2 to 1,000m^2)	80.98	80.98	80.98	80.98
Non-residential property low impact	80.98	80.98	80.98	80.98
Non-residential property – large (1,001m^2 to 10,000m^2)	471.93	471.93	471.93	471.93
Non-residential property – very large (10,001m^2 to 45,000m^2)	2,097.52	2,097.52	2,097.52	2,097.52
Non-residential property – largest (45,001m^2 or greater)	5,243.81	5,243.81	5,243.81	5,243.81

Schedule 4 Rouse Hill stormwater drainage services and Kellyville Village stormwater drainage services

Table 8-12 Rouse Hill stormwater drainage charge ($/year, $2019–20)

Charge	2020–21	2021–22	2022–23	2023–24
Rouse Hill stormwater charge for residential properties, vacant land and non-residential properties with land size ≤ 1,000m²	142.91	136.56	130.22	123.87
Rouse Hill stormwater charge for non-residential properties with land size > 1,000m²	142.91 × ((land area in m²)/1000)	136.56 × ((land area in m²)/1000)	130.22 × ((land area in m²)/1000)	123.87 × ((land area in m²)/1000)

Table 8-13 Rouse Hill land drainage charge for new properties and redeveloped properties within the Kellyville Village area ($/year, $2019–20)

Charge	2020–21	2021–22	2022–23	2023–24
Rouse Hill land drainage charge	345.56	345.56	345.56	345.56

Table 8-14 Kellyville Village stormwater drainage charge ($/year, $2019–20)

Property category	2020–21	2021–22	2022–23	2023–24
Residential multi premises	25.28	25.28	25.28	25.28
Residential property – low impact	25.28	25.28	25.28	25.28
Residential standalone property	80.98	80.98	80.98	80.98
Non-residential property within a non-residential multi premises	25.28	25.28	25.28	25.28
Non-residential property – small (200m² or less)	25.28	25.28	25.28	25.28
Non-residential property – medium (201m² to 1,000m²)	80.98	80.98	80.98	80.98
Non-residential property low impact	80.98	80.98	80.98	80.98
Non-residential property – large (1,001m² to 10,000m²)	471.93	471.93	471.93	471.93
Non-residential property – very large (10,001m² to 45,000m²)	2,097.52	2,097.52	2,097.52	2,097.52
Non-residential property – largest (45,001m² or greater)	5,243.81	5,243.81	5,243.81	5,243.81

Schedule 5 Rouse Hill recycled water supply services

Table 8-15 Rouse Hill recycled water usage charge ($/kL, 2019–20)

Charge	2020–21	2021–22	2022–23	2023–24
Rouse Hill recycled water usage charge	1.90	1.90	1.90	1.90

Schedule 6 Trade waste services

Pollutant charges for industrial customers

Table 8-16 Pollutant charges for industrial customers ($2019–20)

Pollutant[a]	Acceptance standard (mg/L)[b]	Domestic equivalent	2020-21 $/kg#	2021-22 $/kg#	2022-23 $/kg#	2023-24 $/kg#
BOD Primary WWTPs	See note 1	230	0.319 + [0.154 x (BODmg/L)/600]	0.323 + [0.156 x (BODmg/L)/600]	0.326 + [0.158 x (BODmg/L)/600]	0.330 + [0.159 x (BODmg/L)/600]
BOD – secondary and tertiary WWTPs	See note 1	230	1.574 + [0.154 x (BODmg/L)/600]	1.591 + [0.156 x (BODmg/L)/600]	1.609 + [0.158 x (BODmg/L)/600]	1.627 + [0.159 x (BODmg/L)/600]
Suspended solids – primary WWTPs	600	200	0.450	0.455	0.460	0.465
Suspended solids – secondary and tertiary WWTPs	600	200	1.027	1.038	1.050	1.061
Grease – primary WWTPs	110	50	0.409	0.413	0.418	0.422
Grease – secondary and tertiary WWTPs	200	50	1.063	1.074	1.086	1.098
Nitrogen[c] – secondary/tertiary inland WWTP	150	50	1.177	1.190	1.203	1.217
Phosphorus[c] – secondary/tertiary inland WWTP	50	10	1.359	1.374	1.389	1.405

a The charges for all other pollutants (including ammonia, sulphate (SO_4), total dissolved solids and non-domestic pollutants) are nil.

b The mass of any substance discharged at a concentration which exceeds the nominated acceptance standard (as determined under the Trade Waste Policy) will be charged at double the rate for the mass in excess of the domestic equivalent. Concentration is determined by daily composite sampling by either the customer or us.

c Nitrogen and phosphorous limits do not apply where a wastewater treatment plant (to which the customer's wastewater system is connected) discharges directly to the ocean.

Note: BOD acceptance standards will be set only for wastewater systems declared as being affected by accelerated odour and corrosion. Where a customer is committed to and complying with an effluent improvement program, the customer will not incur doubling of the BOD charging rate.

The oxygen demand of effluent is specified in terms of BOD. Acceptance standards for BOD are to be determined by the transportation and treatment capacity of the receiving system and the end use of sewage treatment products.

per kg of mass above domestic equivalent.

Corrosive substance charge

Table 8-17 Corrosive substance charges for industrial customers - corrosion impacted catchment ($2019–20)

Pollutant	Units	2020-21	2021-22	2022-23	2023-24
Acidity (pH<7)	Per ML of wastewater where pH<7[a]	78.401	79.263	80.135	81.017
Temperature	Per ML of wastewater with temperature >25 °C[b]	8.680	8.776	8.872	8.970

a The charge is applied for each pH1 by which the pH per ML of wastewater is less than pH7, eg if the pH per ML is pH5 then the charge will be multiplied by 2. Where the pH is a number that includes a decimal number then, for charging purposes, the pH will be rounded up where the decimal number is 0.5 or more and rounded down where the decimal number is less than 0.5, eg, a pH6.5 will be rounded up to pH7 and a pH6.3 will be rounded down to pH6.

b The charge is applied for each 1°C by which the temperature per ML of wastewater is greater than 25°C, eg if the temperature per ML is 27°C then the charge will be multiplied by 2. Where the temperature is a number that includes a decimal number then, for charging purposes, the temperature will be rounded up where the decimal number is more than 0.5 and rounded down where the decimal number is 0.5 or less, eg, a temperature of 25.7°C will be rounded up to 26°C and of 25.5°C will be rounded down to 25°C.

Note: Where we declare a wastewater system to be affected by accelerated odour and corrosion, the temperature and pH charge will only apply if the customer is not committed to or not complying with an effluent improvement program.

Trade waste agreement charges

We propose trade waste industrial agreement charges on a daily rate. The charges shown in Table 8-18 and

Table 8-19 are average quarterly rates (annual rates based on 365 days divided by 4 quarters).

Table 8-18 Trade waste industrial agreement charges for Industrial Customers by risk index ($2019–20)

Risk Level	Unit	2020-21	2021-22	2022-23	2023-24
1	$/quarter	2,621.60	2,650.44	2,679.59	2,709.07
2	$/quarter	2,621.60	2,650.44	2,679.59	2,709.07
3	$/quarter	2,621.60	2,650.44	2,679.59	2,709.07
4	$/quarter	1,209.97	1,223.28	1,236.73	1,250.34
5	$/quarter	806.65	815.52	824.49	833.56
6	$/quarter	403.32	407.76	412.24	416.78
7	$/quarter	201.66	203.88	206.12	208.39

Table 8-19 Commercial agreement charges for Commercial Customers ($2019–20)

Service	Units	2020-21	2021-22	2022-23	2023-24
Commercial agreement charge – first process	$/quarter	26.22	26.51	26.80	27.10
Commercial agreement charge – each additional process	$/quarter	8.74	8.84	8.93	9.03

Wastesafe charges

We propose a Wastesafe fixed $ per liquid waste trap charge on a daily rate. The charge shown in Table 8-20 is the average quarterly rate (annual rate based on 365 days divided by 4 quarters).

Table 8-20 Wastesafe charges for Commercial Customers ($2019–20)

Service		Units	2020-21	2021-22	2022-23	2023-24
Fixed $ per liquid waste trap charge		$/quarter	9.89	10.00	10.11	10.22
Missed service (pump out) inspection charge for liquid waste traps ≤ 2,000 litres		Per event	n/a	n/a	n/a	n/a
Missed service (pump out) inspection charge for liquid waste traps > 2,000 litres		Per event	n/a	n/a	n/a	n/a

Substance charges for commercial customers

Table 8-21 Substance charges for commercial customers ($2019–20)

Process	Units [a]	2020-21	2021-22	2022-23	2023-24
Low strength BOD food	Per kL	1.710	1.729	1.748	1.767
Higher strength BOD food	Per kL	2.366	2.392	2.418	2.445
Automotive	Per kL	0.486	0.491	0.496	0.502
Laundry	Per kL	0.402	0.406	0.411	0.415
Lithographic	Per kL	0.281	0.284	0.287	0.290
Photographic	Per kL	Nil	Nil	Nil	Nil
Equipment hire wash	Per kL	2.814	2.845	2.876	2.907
Ship to shore	Per kL	Nil	Nil	Nil	Nil
Miscellaneous	Per kL	Nil	Nil	Nil	Nil
Other (default)	Per kL	Nil	Nil	Nil	Nil
Charge for low and high strength BOD food if pre-treatment is not maintained in accordance with requirements [b]	Per kL	13.006	13.149	13.294	13.440

a Per kL of trade waste discharged into the wastewater system (as determined by Sydney Water in accordance with its Trade Waste Policy).

b This charge applies if pre-treatment is not maintained in line with Sydney Water's Trade Waste Policy.

Note: Shopping Centres with centralised pre-treatment (DAF, biological treatment) will be managed as industrial customers (Risk Index 6) and receive site-specific substance charges.

Trade waste ancillary charges

Table 8-22 Trade waste ancillary charges ($2019–20)

Service	Units	2020-21	2021-22	2022-23	2023-24
Additional inspection	Per inspection	198.53	200.71	202.92	205.15
Application – standard	Per application	785.08	793.72	802.45	811.27
Application – non standard	Per hour	108.29	109.48	110.68	111.90
Application fee – variation	Per application	442.17	447.04	451.95	456.92
Sale of data	Per hour	n/a	n/a	n/a	n/a

Schedule 7 Ancillary and miscellaneous customer services

Table 8-23 Proposed charges for ancillary and miscellaneous services ($2019–20)

Item	Service	2020-21	2021-22	2022-23	2023-24
1	Conveyancing Certificate Electronic	7.01	7.09	7.17	7.25
2	Property Sewerage Diagram (a) Over the counter (b) Electronic (c) Online (Tap In)	 N/A 13.38 24.03	 N/A 13.53 24.29	 N/A 13.68 24.56	 N/A 13.83 24.83
3	Service Location Diagram (a) Over the counter (b) Electronic (c) Online (Tap In)	 N/A 7.63 16.19	 N/A 7.71 16.37	 N/A 7.79 16.55	 N/A 7.88 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	56.53	57.15
8	Workshop Test of Water Meter (a) 20, 25 and 32 mm meters (b) 40 and 50 mm light meters (c) 50 mm heavy, 80, 100 and 150 mm meters (d) 200, 250 and 300 mm meters	 177.11 218.87 244.04 407.08	 179.06 221.28 246.72 411.56	 181.03 223.71 249.43 416.09	 183.02 226.17 252.17 420.67
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	334.23	337.91
12	Water Service Connection Approval Application (80 mm or greater)	326.99	330.59	334.23	337.91
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	51.54	52.11
22	Supply System Diagram	145.26	146.86	148.48	150.11

Item	Service	2020-21	2021-22	2022-23	2023-24
23	Building Plan Approval Application	17.25	17.44	17.63	17.82
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
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 (b) Development requirements - other	 195.42 516.79	 197.57 522.47	 199.74 528.22	 201.94 534.03
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 (b) 25, 30 and 40 mm	 193.15 267.40	 195.27 270.34	 197.42 273.31	 199.59 276.32
38	Integrated Service Connection Application	257.99	260.83	263.70	266.60
39	Sydney Water Hourly Rate	147.23	148.85	150.49	152.15
40	Remote read meter (one off fee) (a) 20mm (b) 25mm (c) 32mm, 40mm, 50mm light (d) 50mm heavy, 80mm, 100mm	 214.56 226.07 248.11 435.26	 216.92 228.56 250.84 440.05	 219.31 231.07 253.60 444.89	 221.72 233.61 256.39 449.78
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.

Table 8-24 An explanation of Ancillary and Miscellaneous services (where required)

Item	Ancillary and miscellaneous service
2	**Property Sewerage Diagram** – diagram showing the location of the private house service line.
3	**Service location diagram** – diagram showing the location of Sydney Water's pipe and structures and property wastewater connection point
6	B**uilding Over/Adjacent to Asset advice** – a letter from Sydney Water regarding a building's compliance with Sydney Water's standards and regulations for building over or adjacent to its pipes or structures.
7	**Water Reconnection** – reconnection of water service at meter, following payment of overdue accounts.
9	**Water Service Disconnection** – Application for the disconnection of an existing water service. This covers administration only. A separate charge will be payable to Sydney Water if it also performs the physical disconnection.
10	**Water Service Connection Installation Application** – Application for an accredited supplier to install a new connection point into Sydney Water's water main. This covers administration only. A separate charge will be payable to Sydney Water if it also performs the physical connection.
11	**Water service connection approval application (32-65mm**) – Application for Sydney Water to approve a water service connection that requires detailed hydraulic assessment. This covers administration and system capacity analysis as required.
12	**Water service connection approval application (80mm or greater)** – Application for Sydney Water to approve a water service connection that requires detailed hydraulic assessment. This covers administration, system capacity analysis as required, and time taken to determine cost of physical installation.
21	**Request for asset construction details (amended)**– *C*onstruction details about Sydney Water's assets that shows the depths of our pipes and structures. The fee is charged by product per drawing and covers the plan, index and related sheets that are directly associated to nominated assets.
22	**Supply system diagram** – A large plan that shows Sydney Water's wastewater, water and stormwater assets. The information can be provided in hard copy or electronic format.
23	**Building plan approval application** – Application for approval of building plans, to determine if proposed buildings works will affect Sydney Water's pipes or structures.
24	**Asset Adjustment Application** - Application for Sydney Water to investigate the feasibility of relocating a water, wastewater or stormwater asset.
25	**Water main fitting adjustment application** – Application for Sydney Water to investigate the feasibility of lowering or raising a water main fitting. This covers administration only. A separate charge will be payable to Sydney Water if it also performs the physical connection.
26	**Water pump application** – Application for Sydney Water to assess the impact on its water assets, in regard to the installation of a pump on a private water service.

8.2.2 Prices for section 12A services

Dishonoured or declined payment and late payment fees

Table 8-25 Proposed dishonoured or declined payment and late payment fees (excluding GST) ($2019–20)

Charge	2020–21	2021–22	2022–23	2023–24
Dishonored or declined payment fee	14.30	14.46	14.62	14.78
Late payment fee	4.75	4.80	4.85	4.90

8.3 Appendix 3 Restricted demand scenario

We have used a restricted demand scenario to demonstrate potential impacts on revenue, prices and bills in 2020–24. Under this scenario, we have assumed an 18.7% reduction in total water demand across 2020–24. This gives an indication of the impact of our proposed revenue adjustment in the case of a sustained reduction in demand due to water restrictions. Table 8-26 compares the restricted demand scenario with the unrestricted demand forecast included in our Price Proposal.

Table 8-26 Forecast demand (GL)

Forecast	2019-20	2020-21	2021-22	2022-23	2023-24
Unrestricted					
Billed metered consumption[a]	509	514	521	527	535
Billed unmetered, non-revenue and recycled top-up	62	62	62	63	63
Total	570[b]	576	583	590	598
Restricted demand scenario					
Billed metered consumption[a]	442	407	413	418	424
Billed unmetered, non-revenue and recycled top-up	61	61	61	61	62
Total	503	468	474	479	486

Notes:

[a] Includes unfiltered water

[b] Total differs from sum of components due to rounding

To forecast the impact of the assumed demand scenario on water sales revenue we needed to forecast the impact the forecast on billed metered consumption. We have assumed reductions in total demand from water restrictions will be made entirely by billed metered properties and do not affect unmetered demand or unfiltered consumption (which is not used for restricted purposes).

Billed metered demand is forecast to decrease by about 20.7%. This is greater than 18.7% because the savings of 18.7% of *total demand* are assumed to be made entirely by billed metered properties and billed metered demand is about 90% of total demand.

8.4 Appendix 4 List of figures and tables

Figures

Tables

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