WaterNSW Pricing Proposal to the Independent Pricing and Regulatory Tribunal

Regulated prices for Greater Sydney 2020-2024

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Chief Executive Officer Foreword

I am pleased to submit WaterNSW's proposal to the NSW Independent Pricing and Regulatory Tribunal for our customers' prices in the Greater Sydney area from 1 July 2020. This proposal is aligned to our ongoing commitment to be recognised and valued by our customers for excellence in efficiently delivering their water needs to help make our communities healthy and prosperous.

At the time of lodging this proposal drought conditions remain throughout the Sydney catchments and storage inflows remain low as we have been receiving near zero rainfall. We are proposing to invest in drought-related planning works in 2019-20 and are assessing a number of drought supply options in close collaboration with Sydney Water and the NSW Government to secure Sydney's water supply in deep drought – should conditions worsen. We are committed to ensuring a safe and secure water supply during the worst drought on record.

For the next regulatory period, WaterNSW's proposal will see the price of raw water to our customers decrease in real terms over the four-year period. This decrease is proposed despite our plans to deliver a significantly larger Greater Sydney capital investment program over the next four years.

We are able to reduce prices by passing on lower operating costs than previously approved by IPART due to efficiency reforms and lower funding costs from the financial markets. We have been able to achieve operating savings at a time when the organisation has been devoting time and effort to manage drought. We are confident our proposal represents the least cost solution to provide required services to our customers.

Importantly, our proposed lower prices do not represent a reduction in service quality. WaterNSW remains committed to providing customers with uninterrupted supply of the highest possible quality water. We will continue to promote improvements in water quality standards and contribute to the protection of public health and the environment through enhanced catchment protection practices in Sydney's drinking water catchments and improve customer access to online water information.

We are proposing to invest $682 million in capital works over the four-year determination to ensure our assets continue to provide reliable service and secure supply to meet Sydney's growing population. Our proposed capital program includes projects to improve the resilience of our network when facing pressures associated with drought, to renew assets and to minimise the footprint of our operations on the environment.

While we have only included funding for planning works for drought measures in this proposal, we have provided a framework which we hope IPART will consider for funding the resulting drought supply options, should they be required during the four-year determination period.

In preparing this proposal, we consulted openly with our customers and sought to communicate the rationale behind our proposal. I am confident IPART's determination process will provide a robust outcome for WaterNSW's customers. WaterNSW looks forward to continuing our engagement with all stakeholders throughout the determination process and beyond.

David Harris
Chief Executive Officer

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Executive summary

WaterNSW is pleased to submit our 2020-24 Greater Sydney Pricing Proposal to the NSW Independent Pricing and Regulatory Tribunal (IPART) for the 2020-24 Determination period. This pricing proposal sets out our forecast revenue requirements and prices for bulk water in the Greater Sydney region from 1 July 2020 to 30 June 2024.

WaterNSW was formed on 1 January 2015 under the *Water NSW Act 2014*, effecting a merger of the Sydney Catchment Authority (SCA) and State Water Corporation (SWC), creating a centre of excellence for raw water supply and the development and delivery of raw water infrastructure solutions for all of NSW. WaterNSW is Australia's biggest water supplier and is the major supplier of raw water in NSW, delivering raw water from 42 large dams, pipelines and the State's rivers.

WaterNSW ensures that the water supplied is reliable and, where that water is to be used by end-use customers for drinking, that it is safe. We develop water infrastructure solutions to improve water security and proactively manage reliability issues and then plan, develop, operate and maintain that infrastructure.

WaterNSW also promotes improvements in achievable water quality standards and contributes to the protection of public health and the environment through enhanced catchment protection practices in declared drinking water catchments.

In the Greater Sydney area, our role is to protect 16,000 square kilometres of drinking water catchments, and manage dams, pipelines and other infrastructure that are used to supply customers with quality raw water. WaterNSW supplies raw water to urban water utilities for treatment and then consumption by Sydney, Illawarra, Blue Mountains, Southern Highlands and Shoalhaven communities. Our customers include Sydney Water, Wingecarribee Shire Council, Shoalhaven City Council and Goulburn-Mulwaree Council. WaterNSW also provides raw and unfiltered water supply to over sixty other smaller customers. The area of our Greater Sydney operations shown in Figure 1 below.

WaterNSW works closely with NSW Government agencies and State Owned Corporations including the NSW Department of Planning & Environment and Sydney Water to manage and plan for Sydney's long-term supply and demand.

Key facts about our operations are highlighted in Figure 2 below.

Figure 1 – WaterNSW's Greater Sydney area of operation

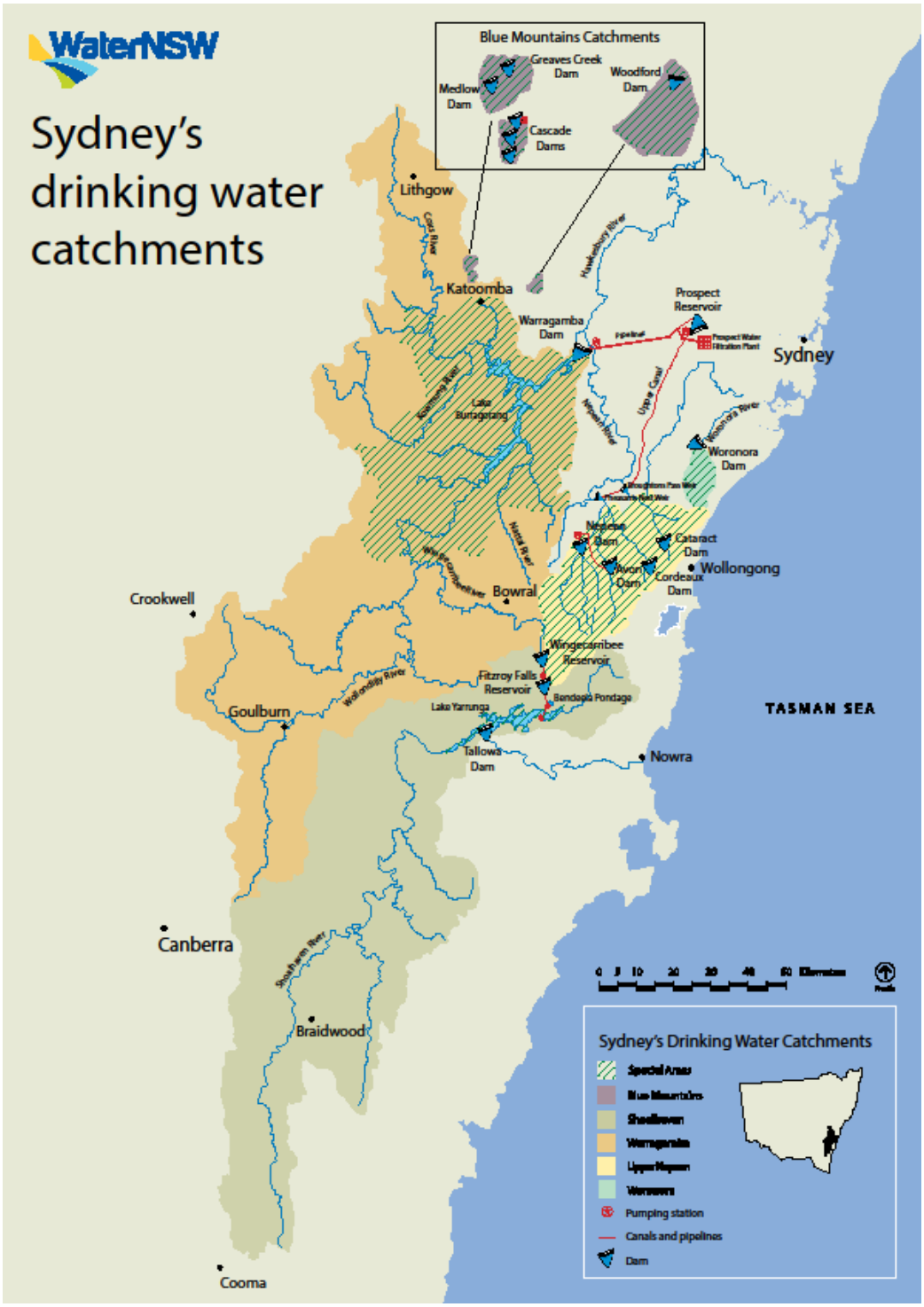


Figure 2 – WaterNSW key facts

Our purpose is:

to improve the availability of water resources that are essential for the people of NSW.

Our vision is that we are:

recognised and valued by our customers for excellence in efficiently delivering their water needs to help make our communities healthy and prosperous.

Our strategic goals are identified in Figure 3.

Figure 3 – WaterNSW strategic goals

Safety is our number one priority. We have delivered and continue to deliver programs designed to embed positive safety behaviour throughout all areas of our organisation. Our *Investment in You* program has focussed on building the personal resilience, confidence and empowerment capability of our people. We are also investing in staff leadership training aimed at achieving better outcomes for our customers.

We are proud to propose average prices to customers that decrease when excluding the impacts of inflation over the four-year determination period, despite a significantly enhanced proposed capital program to ensure the ongoing supply of quality water. We can reduce prices by passing on lower operating costs than previously approved by IPART from efficiency reforms driven by WaterNSW and lower funding costs from the financial markets.

These savings have been delivered at a time when the business has been required to dedicate significant time and effort to manage drought.

We are confident our proposal represents the least cost solutions to provide required services to our customers.

Impact of drought

Greater Sydney's water supply is large and secure. Even though we own and operate a highly secure and adaptable network with the ability for internal transfers to tackle pressure points, an extreme drought across NSW is having an impact on Sydney's catchments placing pressure on our drought security.

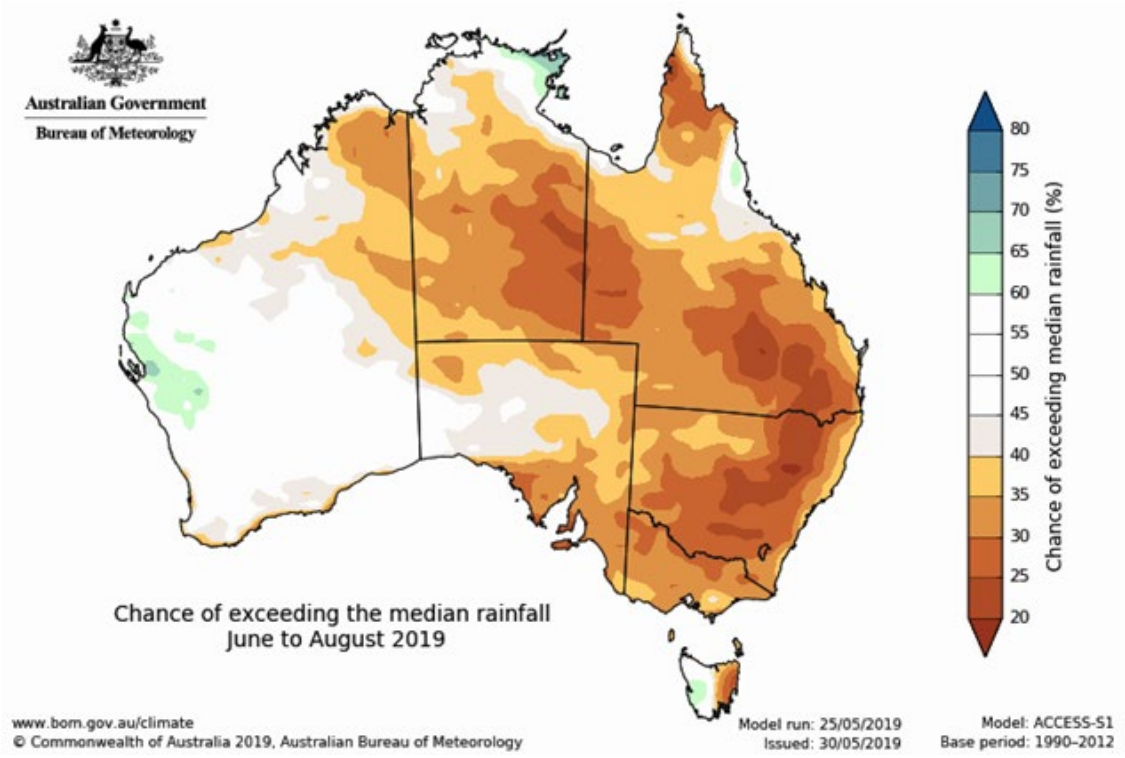
Storage levels have been depleting over the past two years at rates not seen since the 1940s (World War II) and the Millennium droughts. This has been in large part due to the current climate, increasing population and higher than normal temperatures (leading to increased demand).

In September 2017 storage levels were at 90%. By 27 January 2019, storage levels were at 60%, a depletion of 30% in little over a year at an average rate of around 2% per month. Total verified dam storage in the Greater Sydney System is approximately 52.3% capacity as at 23 June 2019.

However, climate forecasts[1] by the Australian Bureau of Meteorology suggest there will be no reprieve to the current drought in the short term.

Climatic conditions are hotter and drier than long-term averages. As illustrated in Figure 4 below, the chance of exceeding the median rainfall over the next three months is forecast to be well below 50%, approaching 20% to 40% in most parts of Greater Sydney catchment areas. This suggests that inflows are likely to be below historic levels at least for the short term, likely leading to current depletion rates continuing over the foreseeable future.

Figure 4 – Chance of exceeding the medium rainfall June to August 2019



Source: www.bom.gov.au/climate

As a prudent water supply planner, a number of drought supply options are being assessed by WaterNSW in close collaboration with Sydney Water and the NSW Government to secure water supply for Greater Sydney, should the current intense drought conditions continue.

WaterNSW continues to devote considerable resources to secure the State's water in the light of the ongoing effects of drought. This includes working closely with the NSW Government and Sydney Water to identify and assess detailed drought supply options in accordance with the requirements of the 2017 Metropolitan Water Plan. This is a critical obligation for WaterNSW and a challenge that management has embraced.

Drought has affected many aspects of our business over the 2016-20 Determination period, including investments we were required to make to plan for major drought supply options. WaterNSW is forecasting to spend over $57 million on planning for drought resilience in 2019-20, an investment that was unforeseen at the time of the 2016-20 Determination, but one that is critical to ensure we remain 'plan ready' to maintain water supply to Greater Sydney.

[1] DPI Seasonal Outlook, 2019.

We have proposed expenditure of approximately $236 million for the construction of new infrastructure for accessing currently inaccessible deep water for supply at Avon Dam to enhance the resilience of our water supply network and to contribute to drought mitigation, plus a small level of expenditure for drought relief planning. Due to a combination of a drive for efficiencies and lower interest rates from financial markets, we are able to invest to increase the resilience of our network while at the same time proposing prices to customers that fall in real terms. We believe this is a prudent and responsible balance of water security and price for Greater Sydney customers.

Investing to mitigate the impacts of drought, however, does not seamlessly align with the regulatory determination cycles leading to cost, timing and scope uncertainty associated with the major drought supply options being assessed. While we have outlined a framework for addressing the costs of major drought supply options, we have not included the costs of constructing one or more of the options themselves as part of this proposal, due to the options being considered and the need for business cases to be developed. Our framework for addressing the uncertainty associated with these major projects is outlined in Section 4 'Regulatory Framework'.

Changes in our operating environment

In addition to the impact of drought, since the 2016-20 Determination there have been a number of events that have significantly impacted on the current and future operation of our bulk water supply business for Greater Sydney. These changes include:

- **Organisation changes**. WaterNSW undertakes functions previously provided by three legacy organisations (State Water Corporation, Sydney Catchment Authority and the NSW Department of Industry - Water). In early 2019, WaterNSW moved to a single Enterprise Agreement for our Award staff and we are harmonising our Information and Communications Technology (ICT) systems (including a unified Enterprise Resource Management system). Our Customer Information Management System (CIMS) has been successfully launched, which will lead to the retirement of outdated (and costly) legacy ICT systems.

- **A lower interest rate environment**. Due to financial market movements lower interest rates continue to place downward pressure on water prices. This is a good outcome for customers.

- **Improved investment governance**. We have reviewed and enhanced our investment governance, asset management and maintenance strategies to ensure they are best practice and deliver targeted outcomes for customers at least cost.

- **Asset Management and Delivery Capability**. WaterNSW has implemented a new structure to support both the effective asset management and delivery of capital works. This now includes dedicated teams for determining long, medium, and short-term asset needs, with an increased focus on the requirements of customers. The delivery team has been restructured to allow for increased delivery capability and scalability across the combined business. This includes an adaptive model allowing resources to be directed to priority areas across the portfolio and to be efficiently supplemented by external resources as required.

- **Review of labour sourcing models**. We have undertaken a comprehensive review of our labour sourcing with a view to 'insource' strategic water management activities to leverage our expertise while looking to 'outsource' non-strategic activities that can be provided at lower cost by the market. This is expected to result in improved stewardship of our assets, including more targeted maintenance based on condition assessments and improved delivery models, while continuing to ensure value for money for our customers.

- **Improved procurement function**. Our approach to procurement has undergone a fundamental shift to ensure we achieve better value for money when procuring goods and services from the market.

Proposed revenue requirement

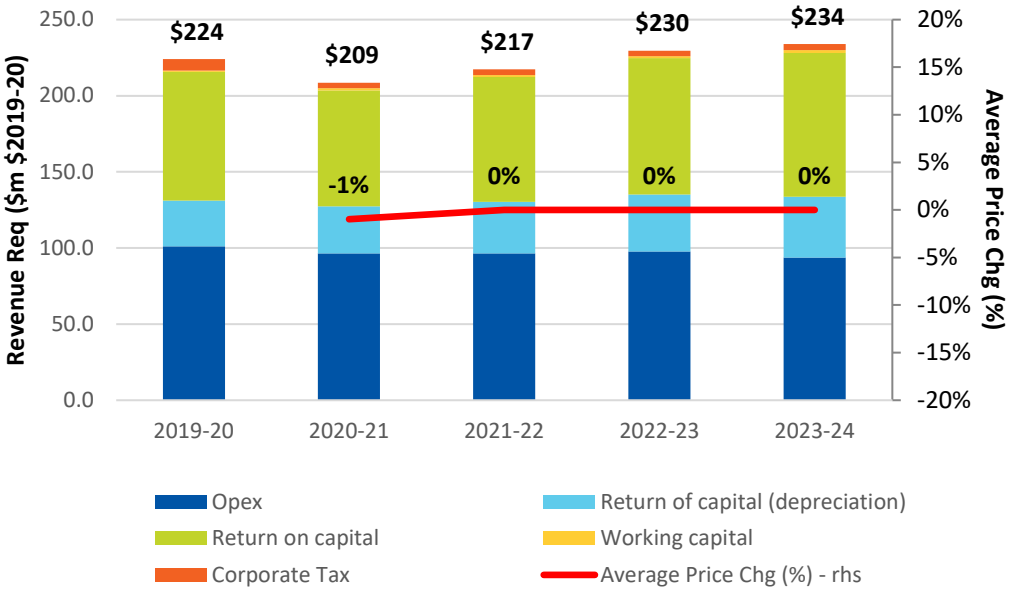
For the 2020-24 Determination period, WaterNSW is proposing a total revenue requirement[2] of $890 million ($2019-20), or an average revenue requirement of around $222 million per annum. In real terms, the target revenue in 2023-24 is around 0.8% higher compared to that of 2019-20. The marginally higher revenue requirement is driven by a prudent and efficient capital expenditure program of $682 million to ensure our assets continue to provide reliable service while also improving the resilience of our network to external pressures such as drought while minimising the footprint of our operations on the environment.

The increased costs of the capital expenditure program are partially offset by lower operating costs compared to the current determination due to efficiency reforms and lower expected forecast funding costs from financial markets. Growth in forecast water sales also contributes to lower proposed prices in real terms over the 2020-24 Determination period.

WaterNSW is committed to supplying raw water efficiently and at the lowest possible cost to customers. Operating efficiency gains will continue to be made through rigorous review of all expenditure to ensure operations and expected levels of service are being provided at least cost. We will also strategically employ technology to deliver improved outcomes at lowest cost.

Figure 5 and Table 1 below illustrate our proposed total (unsmoothed) revenue requirement from 2020-21 based on IPART's building block framework.

Figure 5 – Greater Sydney total revenue requirement ($millions, $2019-20)



Source: WaterNSW analysis

[2] Revenue requirement refers to the sum of the building blocks in IPART's building block approach. See Section 4.1.1 for details.

Table 1 – Greater Sydney total revenue requirement ($millions, $2019-20)

	2019-20	2020-21	2021-22	2022-23	2023-24	Total FY21-24
Operating Expenditure	101.0	96.5	96.4	97.8	93.7	384.4
Return on Assets	84.5	76.1	82.1	89.4	94.3	341.9
Return of Assets (Depreciation)	30.2	30.9	33.9	37.4	40.0	142.3
Return on Working Capital	0.8	1.4	1.2	1.3	2.0	6.0
Regulatory Tax Allowance	7.6	3.6	3.7	3.7	4.0	15.0
Total Revenue Requirement	**224.0**	**208.6**	**217.3**	**229.6**	**234.1**	**889.6**

Note: 2019-20 is the last year of IPART's 2016-20 Determination.

Proposed capital expenditure

WaterNSW is proposing to invest $682 million ($2019-20) of capital over the 2020-24 Determination period. The capital expenditure program underlying this forecast will allow us to continue to ensure the availability of water resources that are essential for the people of NSW and to comply with our operating licence.

Our proposed capital program for the 2020-24 Determination period is 110% higher than the $326 million ($2019-20) we expect to invest over the current 2016-20 Determination period.

The capital investment program in this pricing proposal is developed according to an investment governance framework and asset management framework and strategy that have been enhanced during the current regulatory period, leading to greater confidence in the prudency and efficiency of our proposed programs. This has led to improved processes to identify the lowest cost, long-term sustainable investment levels for our recurrent expenditure.

Expenditure in the early part of the 2020-24 Determination period is predominantly focussed on maintaining asset reliability and asset renewals, including the Warragamba to Prospect pipeline and corridor restoration at a cost of approximately $108 million.

From 2021-22 onwards, the major component of our proposed capital expenditure is for the Avon Dam deep water access at an estimated cost of approximately $236 million. The project objective is to provide drought resilience by addressing the supply risk to the Illawarra, by enabling access to the deep inaccessible water in the reservoir, thereby providing more time (up to an additional two years) for the Illawarra to get through a prolonged continuation of drought with near zero inflows.

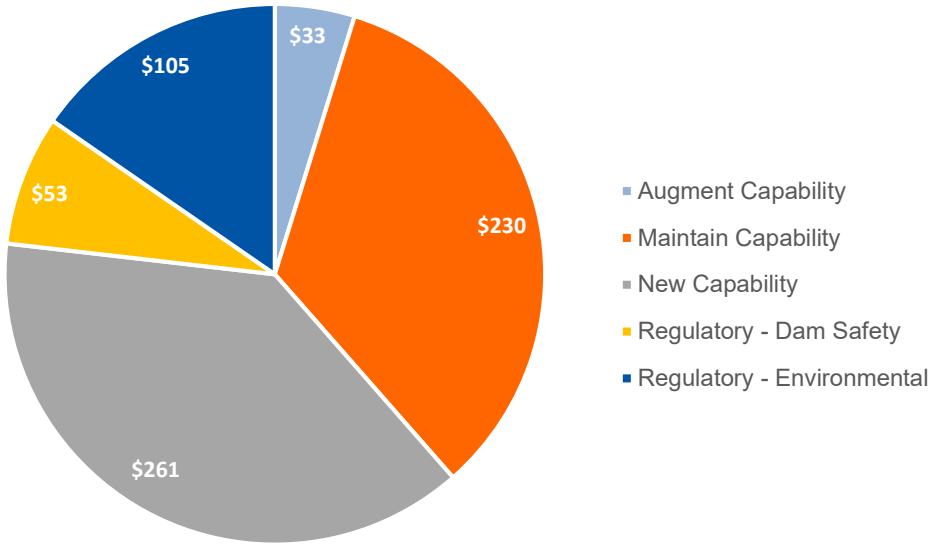
To minimise environmental impacts, we are also proposing expenditure of approximately $100 million for Warragamba environmental flow release construction in response to the NSW's Government's 2017 Metropolitan Water Plan[3] and its policy objectives for the health of the Hawkesbury-Nepean River.

Included in the capital expenditure plan is minor funding for preliminary planning for several other drought measures. These planning activities are included irrespective of storage levels as preliminary planning work is prudent to shorten the lead-time for any future drought response, if required.

A breakdown of the proposed capital expenditure by driver is provided in Figure 6 and Table 2 below.

[3] Refer to https://www.planning.nsw.gov.au/-/media/Files/DPE/Other/About-us/Metropolitan-Water/2017-Metropolitan-Water-Plan.pdf?la=en

Figure 6 - Greater Sydney proposed capital expenditure by capability driver ($millions, $2019-20)



Source: WaterNSW analysis

Table 2 – Proposed capital expenditure forecast by key driver ($millions, $2019-20)

	2019-20	2020-21	2021-22	2022-23	2023-24	Total FY21-24
Augment Capability	8.3	12.2	7.9	7.3	5.3	32.6
Maintain Capability	74.6	65.0	55.4	53.2	56.8	230.4
New Capability	68.4	44.1	98.2	108.5	10.5	261.3
Regulatory - Dam Safety	4.9	12.8	15.2	17.5	7.7	53.2
Regulatory - Environmental	9.4	13.2	40.2	30.4	21.2	104.9
Total	**165.6**	**147.2**	**216.9**	**216.9**	**101.5**	**682.4**

Note that numbers may not add up due to rounding

Source: WaterNSW

Proposed operating expenditure

Through effective management of our operating expenditures and through the reprioritisation of projects and programs over the regulatory period, we expect to deliver savings in each year of the 2016-20 Determination period.

For the 2020-24 Determination period, we propose operating expenditures of $384 million, which represents a $23 million, or 6%, decrease from IPART's allowances in the 2016-20 Determination and a $23.5 million, or 6.5%, increase over our actual / forecast expenditure in the current regulatory period[4]. This proposal represents WaterNSW's commitment to contain and reduce operating expenditure throughout the next determination period.

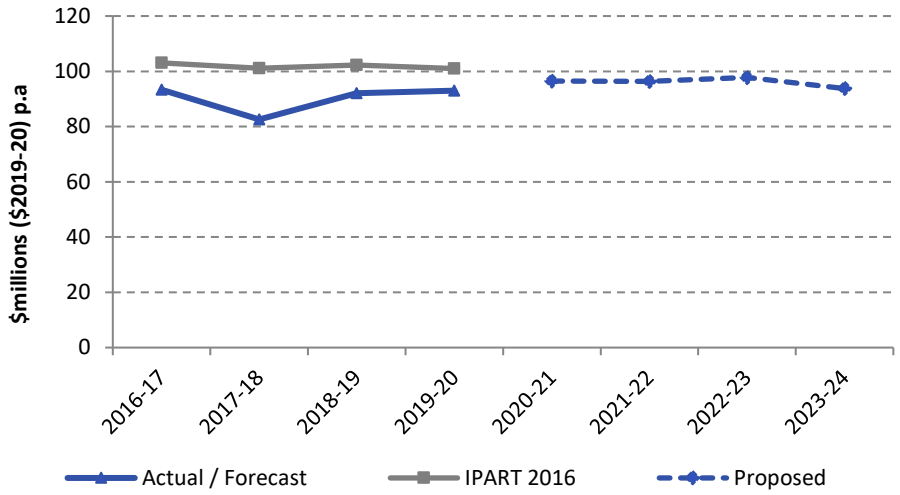
Our proposed expenditures ensure we are able to maintain our assets at long-term sustainable levels. We will also better protect Sydney's water catchment by improving fire management, pest and weeds management, monitoring and surveillance of our water ways, infrastructure and natural environment and co-operation with local landholders.

[4] Dollar values expressed in $2019-20.

In 2023-24, WaterNSW's proposed operating expenditure will be 7.2% lower in real terms than the amount forecast by IPART in its 2016-20 Determination for 2019-20.

Our proposed operating expenditure program is set out in Figure 7 and Figure 9 below and discussed in detail in Section 6 'Operating Expenditure'.

Figure 7 – Operating expenditure allowance and actual operating expenditure 2016-17 to 2019-20, proposed operating expenditure 2020-21 to 2023-24 ($millions, $2019-20)



Source: WaterNSW analysis

The increase in proposed operating expenditure from 2019-20 to the forecast expenditures over the 2020-24 Determination period is due to a range of activities, including an increase in water monitoring, increases in land management costs, increased maintenance activities, higher land contamination costs and increases in insurance premiums.

Proposed prices

WaterNSW's proposal will see the cost of raw water to Sydney Water decrease by 1% over the 2020-24 Determination period in real terms (assuming the Sydney Desalination Plan (SDP) is in shutdown mode) as shown in Table 3 below.

Table 3 – Proposed prices for Sydney Water (Sydney Desalination Plant OFF) ($2019-20)

	2019-20	2020-21	2021-22	2022-23	2023-24
Fixed Charge ($ million)	175	175	176	176	177
Variable Charge ($ / megalitre)	80	76	75	75	74
Revenue from Fixed Charge ($ million / year)	175	175	176	176	177
Revenue from Variable Charge ($ million / year)	45	44	44	44	44
Total Revenue ($ million)	**221**	**219**	**220**	**220**	**221**

Source: WaterNSW analysis

As illustrated in Table 4 below, our proposed prices would result in a $0.86, or 0.07%, reduction to a Sydney Water end customer's bill in 2020-21, on the basis that WaterNSW's costs represent approximately 8.23% of Sydney Water's total current costs.

Table 4 – Bill impact for Sydney Water's end use customers ($2019-20)

	2019-20	2020-21	2021-22	2022-23	2023-24
Pass through to customers ($)	$99.46	$98.60	$98.84	$99.08	$99.39
Change attributable to WaterNSW (%)	N/A	-0.07%	-0.05%	-0.03%	-0.01%

Source: WaterNSW analysis

Prices for Council customers, raw water customers and unfiltered water customers are also proposed to decrease by 1% in real terms over the determination period.

Managing uncertainty

We consider that a well-functioning regulatory framework needs to ensure a reasonable sharing of risks so that a business can recover its efficient costs. An important element of the framework is the inclusion of regulatory mechanisms that allow for significant unforeseen costs that are triggered by uncertain events during the regulatory period.

WaterNSW is proposing a **four-year determination period** with an expanded **cost pass through framework** that addresses the costs associated with unanticipated external events such as regulatory, legislative and tax changes and catastrophic events. We are also proposing the continuation of the current 'cost pass through' for **Shoalhaven transfers** while addressing an anomaly in IPART's pricing formula that results in the allowed cost of electricity being below efficient costs.

In order to manage potentially significant volume risks associated with drought, we are proposing to introduce a **demand volatility adjustment mechanism** similar to that applied for Hunter Water and Sydney Water and to maintain the existing formula-based pricing arrangements from the 2016-20 Determination associated with the operation of the **Sydney Desalination Plant**.

WaterNSW is also planning to proceed with additional drought security measures should our dam levels continue to fall. Significant capital projects may need to be commenced during the term of the forthcoming pricing determination. This submission only includes funding for planning works for a number of potential projects.

We therefore propose a number of regulatory mechanisms to address the financial risk of projects that may be triggered but are not provided for in the determination due to timing and scope uncertainty.

Our preference to manage these risks is for the introduction of a National Electricity Market-style **contingent projects** mechanism, but we recognise that if IPART considers it is unable to introduce such a mechanism that other mechanisms will need to be adopted, such as reopening the determination, rolling forward the expenditures in the Regulatory Asset Base (RAB) to be included in prices for the subsequent (i.e. 2024) determination and or providing for a shorter determination period.

We consider that some combination of these mechanisms needs to be incorporated in the determination so that WaterNSW is able to recover its efficient costs in the light of significant uncertainty.

Our proposed approach to managing uncertainty is discussed in Section 4 'Regulatory framework'.

Our pricing proposal

Our pricing proposal comprises this main submission document including Appendices A to F and the attachments listed below as submitted by WaterNSW to IPART on or before 1 July 2019:

Reference no.	Supporting document
Attachment 1	Governance and decision-making framework
Attachment 2	10-year Capital Investment Plan
Attachment 3	Capital expenditure project and program justifications - Summary
Attachment 4	Cost Allocation Manual
Attachment 5	Annual Information Return (AIR) / Special Information Return (SIR)
Attachment 6	Populated IPART Building Block Model

This pricing proposal sets out our forecast revenue requirements and prices for bulk water in the Greater Sydney region from 1 July 2020 to 30 June 2024. All dollar values in this pricing proposal are expressed in real $2019-20 dollars unless otherwise stated.[5]

[5] Tables may not add due to rounding.

1 Our role and services we provide

The purpose of WaterNSW is to improve the availability of water resources that are essential for the people of NSW.

1.1 What we do

WaterNSW is Australia's biggest water supplier. We own and operate 42 water supply dams across NSW, as well as hundreds of weirs, regulators and pipelines. We supply and deliver water through our infrastructure and the State's river systems to our customers, including Sydney Water, farmers, irrigators, regional towns and industry.

WaterNSW ensures that it supplies raw water in bulk for both domestic stock and irrigation, as well as for drinking water purposes. Paramount to this is water supply security and reliability, which we achieve through the development of infrastructure solutions. We plan, build, operate and maintain the infrastructure. WaterNSW also seeks improvements in achievable water quality standards and contributes to the protection of public health and the environment through enhanced catchment protection practices in declared catchments.

The services we deliver include:

- **Source water protection**: protecting the Greater Sydney drinking water catchment to ensure safe water is supplied to Sydney Water, local councils and other distributors for treatment and distribution to their customers
- **Bulk water supply**: supplying water from our storages to customers in the Greater Sydney drinking water catchment and in the State's regulated surface water systems
- **System operator**: efficiently managing the State's surface and groundwater resources to maximise reliability for users through the operation of the State's river systems and bulk water supply systems for Rural Valleys, in collaboration with the Murray-Darling Basin Authority which directs operations of the River Murray system
- **Infrastructure planning**, **delivery and operation**: meeting customer-defined levels of service consistent with NSW Government policy and priorities to increase the security and reliability of water supplies to our customers and the communities of NSW
- **Customer water transaction and information services**: providing efficient and timely services to our customers for water licensing and approvals, water trades, billing and meet their water resource information needs for surface and groundwater quantity and quality.

We are committed to be a modern, efficient and highly customer and stakeholder focussed organisation.

1.2 Our regulated and non-regulated services

WaterNSW's monopoly services are the subject of four separate IPART price determinations:

- the services we supply to Sydney Water and some councils and minor customers in the Greater Sydney area are subject to the IPART Determination – *WaterNSW, Maximum prices for water supply services from 1 July 2016 in relation to Sydney Catchment Functions, June 2016* (2016-20 Determination)

- the services we supply to irrigators, regional councils, mines, energy companies and environmental water holders in rural areas are subject to the IPART Determination – *WaterNSW, Prices for rural bulk water services from 1 July 2017, June 2017* (Rural Valleys Determination)

- the services we supply to Essential Water and a small number of landholders near Broken Hill for the Murray River to Broken Hill pipeline are subject to the IPART Determination – WaterNSW, *Prices for water transportation services provided by the Murray River to Broken Hill Pipeline from 1 July 2019*, 30 May 2019 (Murray River to Broken Hill Pipeline Determination)

- the services we supply subject to the IPART Determination – *Water Administration Ministerial Corporation, Maximum prices for Water Management services from 1 July 2016* (WAMC Determination). We share responsibility for the delivery of the services (primarily licensing and water management) the subject of that determination with the Department of Industry – Water[6] (DOI) and the Natural Resources Access Regulator (NRAR) and share the revenue under that determination with DOI/NRAR.

This pricing proposal is in relation to the monopoly services we supply under the Greater Sydney Determination for the period after the expiry of the current determination (post 30 June 2020).

These services include the supply of 'bulk' water to urban water utilities for treatment and then consumption by Sydney, Illawarra, Blue Mountains, Southern Highlands and Shoalhaven communities.

Our customers include Sydney Water, Wingecarribee Shire Council, Shoalhaven City Council and Goulburn-Mulwaree Council. We also provide raw and unfiltered water supply to 63 other smaller customers.

WaterNSW also supplies non-monopoly services within the Greater Sydney region such as leasing some of our facilities and certain commercial hydrometrics services.

1.3 Legislative framework we operate under

WaterNSW was formed on 1 January 2015 under the *Water NSW Act 2014 (NSW)* (WaterNSW Act). WaterNSW assumed the functions of SWC and SCA[7]. WaterNSW replaced SWC in Schedule 5 of the *State Owned Corporations Act 1989 (NSW)* (SOC Act), making WaterNSW a statutory state owned corporation under that Act.

WaterNSW further increased its scope on 1 July 2016 when the *Water NSW Amendment (Staff Transfers) Act 2016* took effect to facilitate the transfer of employees of the then Department of Primary Industries - Water to WaterNSW. This enabled WaterNSW to carry out functions of the Minister and the Water Administration Ministerial Corporation (WAMC) conferred on WaterNSW under its operating licence[8] in relation to water monitoring and licensing.

The principal objectives of WaterNSW set out in section 6 of the WaterNSW Act are:

[6] Previously, the Department of Primary Industries – Water. All references to the Department of Primary Industries - Water or the Department of Industry - Water in this pricing proposal will be termed "DOI".
[7] On 1 January 2015 the assets, rights and liabilities of the former SCA were transferred to WaterNSW.
[8] The conferred functions are set out in Schedule A of the WaterNSW Operating Licence 2017-2022.

a) *to capture, store and release water in an efficient, effective, safe and financially responsible manner, and*

b) *to supply water in compliance with appropriate standards of quality, and*

c) *to ensure that declared catchment areas and water management works in such areas are managed and protected so as to promote water quality, the protection of public health and public safety, and the protection of the environment, and*

d) *to provide for the planning, design, modelling and construction of water storages and other water management works, and*

e) *to maintain and operate the works of Water NSW efficiently and economically and in accordance with sound commercial principles.*

The other objectives of WaterNSW, set out in section 6(2) of the WaterNSW Act are of equal importance but are subordinate to the principal objectives of WaterNSW. They are:

a) *to be a successful business and, to that end:*
(i) to operate at least as efficiently as any comparable business, and
(ii) to maximise the net worth of the State's investment in Water NSW,

b) *to exhibit a sense of social responsibility by having regard to the interests of the community in which it operates,*

c) *to exhibit a sense of responsibility towards regional development and decentralisation in the way in which it operates,*

d) *where its activities affect the environment, to conduct its operations in compliance with the principles of ecologically sustainable development contained in section 6 (2) of the Protection of the Environment Administration Act 1991.*

1.4 Our operating licence

WaterNSW operates in accordance with its operating licence granted under section 11 of the WaterNSW Act. The term of the current operating licence is 1 July 2017 to 30 June 2022. The operating licence authorises WaterNSW, within its Area of Operations (the whole of the State of NSW):

a) *to capture and store water and to release water:*
i) to persons entitled to take the water, including release to regional towns; and
ii) for any other lawful purpose, including the release of environmental water;

b) *to supply water to Sydney Water;*

c) *to supply water to water supply authorities and to local councils or county councils prescribed by the Regulations;*

d) *to supply water to persons referred to in section 7(1)(d) of the Water NSW Act;*

e) *to supply water to other persons and bodies, but under terms and conditions that prevent the person or body concerned from supplying the water for consumption by others within the State unless the person or body is authorised to do so by or under an Act*

f) *to construct, maintain and operate Water Management Works (including providing or constructing systems or services for supplying water);*

g) *to protect and enhance the quality and quantity of water in Declared Catchment Areas;*

h) to manage and protect Declared Catchment Areas and Water Management Works vested in or under the control of Water NSW that are used within or for the purposes of such areas;

i) to undertake research on catchments generally, and in particular on the health of Declared Catchment Areas; and

j) to undertake an educative role within the community.

The requirements listed in the operating licence that are most relevant to this pricing proposal are summarised in Box 1.1.

Box 1.1 Summary of WaterNSW Operating Licence

The WaterNSW Operating Licence specifies certain requirements relating to:

- **Water Source protection and conservation**:
  - maintaining a Water Quality Management System
  - managing and protecting the Declared Catchment Area
  - providing information on the Declared Catchment Areas
  - managing Catchment Infrastructure Works management
  - recalculating System Yield when certain events occur
  - reviewing the model for the System Yield by first quarter of 2021
  - preparing a WaterNSW's water conservation strategy
  - maintaining a program of research for each Declared Catchment Area.

- **Bulk Water storage and transmission:**
  - construct, maintain and operate Water Management Works in accordance with our Asset Management System
  - ensuring that water is supplied in accordance with the Water Quality Management System, any relevant Customer Supply Agreement, and any relevant arrangements.
  - managing of capture, store and release (CSR) water and timely processing of water orders
  - maintaining a register of relevant Local Water Utilities.

- **Performance Standards:**
  - requirement to meet specified Performance Standards
  - managing the quality of water supplied to customers in accordance with the relevant Water Quality Management System required (***Supply Water Quality Performance Standard***)
  - managing service interruptions in accordance with the Asset Management System (***Supply Service Interruption Performance Standard***)
  - meeting CSR Water Performance Standards.

- **Organisational systems management:**
  - Maintain and implement a Management System consistent with the Australian Standard AS ISO 55001:2014 Asset Management – Management systems - Requirements or other standard approved by IPART on request by Water NSW (***Asset Management System***).

- **Environmental Management System:**
  - Maintain and implement an Environmental Management System consistent with the Australian/New Zealand Standard AS/NZS ISO 14001:2016: Environmental management systems – Requirements with guidance for use or other standard approved by IPART, on request by Water NSW (***Environmental Management System***)

- **Customer and stakeholder relations:**
  - Establish and maintain Customer Supply Agreements with each customer to whom we supply water –other than Sydney Water setting out the terms and conditions for the Supply of water

(***Customer Supply Agreements***) (Under section 25 of the WaterNSW Act, Water NSW is required to enter into arrangements with Sydney Water.)
  - only Supply water to these Customers in accordance the Customer Supply Agreements
  - the Customer Supply Agreements, at a minimum, must include provisions addressing standard of water quality, continuity of the water, any metering arrangements; fees and charges and dispute resolution and complaints handling procedures
  - Water metering and monitoring
  - Undertake an educative role in the community on our activities and functions in Declared Catchment Areas.

- **Memorandum of Understanding**
  - Maintain and comply with a memorandum of understanding with the Secretary of the Ministry of Health
  - Maintain and comply with the memorandum of understanding with the Environment Protection Authority

- **Performance monitoring and reporting:**
  - Providing information for Operational Audits
  - Reporting in accordance with this Licence and the Reporting Manual
  - establish and maintain area-based advisory groups (Customer Advisory Group) and establish and maintain a Customer advisory group charter
  - establish and maintain a Customer service charter (Customer Service Charter)
  - maintain a procedure for complaints consistent with the *Australian Standard AS/NZS 10002:2014: Guidelines for complaints management in organizations (AS/NZS 10002:2014)* or other standard approved by IPART on request by Water NSW (Internal Complaints Handling Procedure).

1.5 Our major agreements

1.5.1 Memorandum of Understanding with NSW Health

NSW Health is a key stakeholder for WaterNSW. As required by our operating licence, WaterNSW maintains a Memorandum of Understanding (MoU) [9] with NSW Health which focuses on water provided for human consumption.

The MOU provides a basis for an ongoing cooperative relationship between NSW Health and WaterNSW to assist meeting joint responsibilities in relation to water quality standards and public health. NSW Health advises Sydney Water and WaterNSW on the application of the Australian Drinking Water Guidelines to ensure safe supply of drinking water.

1.5.2 Water supply agreements

WaterNSW provides raw water to a range of customers across NSW and for some customers this is done through water supply agreements.

Sub-section 25 (2) of the WaterNSW Act requires that the supply agreement with Sydney Water must address:[10]

- water quality standards
- the continuity of water supply

[9] The 2016 Memorandum of Understanding WaterNSW and NSW Health can be found at: https://www.waternsw.com.au/__data/assets/pdf_file/0010/55918/cD2016-90171-Signed-Memorandum-of-Understanding-WaterNSW-and-NSW-Health-August-2016.pdf

[10] WaterNSW Water Supply Agreement with Sydney Water can be found at: https://www.waternsw.com.au/__data/assets/pdf_file/0004/118687/SCA-and-SWC-Raw-Water-Supply-Agreement-2013.pdf

- the costs the customer must pay for the water supply.

Our agreement with Sydney Water, the Raw Water Supply Agreement, is dated 14 October 2013. It provides that it must be reviewed from the five-year anniversary of the commencement date or as agreed by the parties[11]. The parties commenced a review of the agreement in 2018. This review is discussed further in Section 4.8.1.3.

The management of raw water quality is also influenced by:

- the Australian Drinking Water Guidelines
- the Australian and New Zealand Environment and Conservation Council Water Quality Guidelines for Fresh and Marine Waters.

[11] The agreement must also be reviewed as required by the Minister, the Minister administering the Sydney Water Act 1994 or the Premier, or as required by an operating licence of either party.

2 Standards of service

The main services WaterNSW supplies in Greater Sydney relate to:

- **source water protection**: protecting the Greater Sydney drinking water catchment to ensure safe water is supplied to Sydney Water, local councils and other distributors for treatment and distribution to their customers
- **bulk water supply**: supplying water from our storages to customers in the Greater Sydney drinking water catchment
- **infrastructure planning**, **delivery and operation**: meet customer-defined levels of service consistent with NSW Government policy and priorities to increase the security and reliability of water supplies to our customers and the communities in Greater Sydney.

Our service levels for these functions are found mainly within our operating licence. Compliance with our operating licence is discussed in Appendix E.

Important features of our services also include water quality and dam safety. We set out our performance in each of these areas below.

2.1 Water quality performance

The tables below set out our Water Quality Management System performance for 2016-17 (Table 2.1) and 2017-18 (Table 2.2).

Table 2.1 – Water Quality Management System performance – 2016-17

Scorecard	2016-17 Target	2016-17 Actual
Water Quality Risks Understood, Communicated and Responded To		
Science Program delivered and current	Annually	Annual review provided in September 2016
Healthy Catchments Strategy addresses high priority risks	Jun 2016	Source Water Protection Program 2016-20 developed and implemented
Water Monitoring Program current and implemented	Annually	Review to incorporate metro and rural programs essentially complete but NSW Health endorsement pending
Board informed regarding emerging trends in Science including subject specific reports	100%	Presentation on pathogen research provided in December, presentation on impacts of Carp Herpes Virus release scheduled for July
Water quality continuously analysed and emerging risks identified and responded to as required.	100%	All scheduled analyses undertaken during period. Emerging risks discussed internally and with customers as needed
Catchment risks understood by WaterNSW and by NSW Health and Sydney Water	100%	Risk assessments distributed weekly with additional reports prepared as required. Incident specific risk assessments conducted in response to catchment spill incidents
No events in the Sydney Drinking Water Catchment that result in a risk to public health in the water supplies for treatment; zero 'emergency' water quality events	0%	No incidents above significant criticality during the period
Water Quality Supplied is Fit For Purpose		

Water quality supplied for treatment meets Australian Drinking Water Guideline for Health Related characteristics	100%	100% conformance during period
Water quality supplied for treatment meets the Raw Water Supply Agreement	95%	100% conformance during period
Compliance with critical limits at Critical Control Points	5%	<2% overall exceedance YTD due to algae in Wingecarribee raw water and chlorine residual in picnic areas
Culture and Competence Supports Water Quality Objectives		
WaterNSW Prepared to respond to potential Water Quality Events	2/year	Response plans prepared for 2 scenarios (algae and wet weather) – algae scenario was tested, while wet weather scenario not tested due to an actual wet weather event
All relevant WaterNSW staff aware of their water quality obligations	Annually	eLearning module for water quality awareness issued to all staff
Continual Improvement in WQMS and Water Quality Performance		
Identified actions in Water Quality Improvement Plan delivered	95%	2% of actions overdue. One action was subsequently completed with one in progress
"High" to "Full" compliance awarded for all water quality related clauses in annual operational audit	100%	Five full and one high rating in final audit report

Source: WaterNSW

Table 2.2 – Water Quality Management System performance – 2017-2018

Scorecard	2017-18 Target	2017-18 Actual
Water Quality Risks Understood, Communicated and Responded To		
Science Program delivered and current	Annually	Annual review completed October 2017, 16 active projects in progress as at April 2018
Source Water Protection Program addresses high priority risks	Jun 2018	Grazing and Erosion, Urban and Dairy Programs in progress
Water Monitoring Program current and implemented	Annually	Revised program implemented from July 2017. Review completed July 2018
Board informed regarding emerging trends in Science including subject specific reports	100%	Presentation on impacts of Carp Herpes Virus release provided in July 2017, emerging trends provided in March 2018
Water quality continuously analysed and emerging risks identified and responded to as required.	100%	All scheduled analyses undertaken during period. These analyses did not identify any emerging risks
Catchment risks understood by WaterNSW and by NSW Health and customers	100%	Risk assessments distributed weekly with additional reports prepared as required
No events in the Sydney Drinking Water Catchment that result in a risk to public health in the water supplies for treatment; zero 'emergency' water quality events	0%	No incidents above major criticality during the year.
Water Quality Supplied is Fit For Purpose		
Water quality supplied for treatment meets Australian Drinking Water Guideline for Health related characteristics	100%	100% annual conformance
Water quality supplied for treatment meets Raw Water Supply Agreement	95%	99.99% annual conformance
Water quality supplied for treatment within preferred operational ranges	85%	89.9% annual conformance, 94% average conformance Apr-Jun 2018

Compliance with critical limits at Critical Control Points	95%	95.4% annual conformance. Apr-Jun 2018: 9 chlorine exceedances in picnic area taps and 4 exceedances in Duckmaloi distribution system.
Culture and Competence Supports Water Quality Objectives		
Response Plans for potential Water Quality Events prepared and tested	2/year	Tripartite exercise conducted in April, internal desktop exercise conducted in June
All relevant WaterNSW staff aware of their water quality obligations	Annually	eLearning module on water quality awareness rolled out to all staff, module on incident response drafted and targeted awareness sessions provided.
Continual Improvement in WQMS and Water Quality Performance		
Identified actions in Water Quality Improvement Plan delivered	95%	4 of 41 actions overdue as at end of June 2018 (90%), with completion of three actions targeted in 2018-19 and the remaining action launched in April 2019.
Process Health Checks conducted as per schedule	2/month	Five health checks completed in the period from Apr-Jun 2018. Total of 14 health checks completed for the year. Reviewing schedule and delivery options.
"High" to "Full" compliance awarded for all water quality related clauses in annual operational audit	100%	2 clauses audited in 2017: 1 full, 1 high compliance

Source: WaterNSW

2.2 Dam safety

WaterNSW owns, operates and maintains 21 prescribed dams within Greater Sydney. As the owner of these dams, WaterNSW manages risks to public and employee safety, the environment, reliability of supply and the financial wellbeing of the company. To manage these risks, WaterNSW has a comprehensive dam safety program that is based on NSW Dam Safety Committee's (DSC) requirements and guidelines published by Australian National Committee on Large Dams and international best practice.

To meet the requirements of the DSC, WaterNSW's dam safety program is based on inspections and monitoring of instrumentation data from the dams. Potential deficiencies are identified for further study, and when dam safety improvements are found to be necessary, the projects are prioritised and brought into WaterNSW's capital planning process.

A standards-based approach was historically applied to the safety management of the Greater Sydney dams. Risk assessments were carried out on a case by case basis targeting dams with known deficiencies. The selective risk assessments, often undertaken in isolation of each other, informed the risk mitigation upgrades on these dams. This resulted in an inconsistent approach across the Greater Sydney portfolio. To improve on this outcome, WaterNSW is currently undertaking a portfolio risk assessment (PRA) of its Greater Sydney dams which will be completed in 2019[12].

The outputs from the PRA are providing the basis for the future investment in dam safety investigation studies and or risk reduction works, ensuring that the inherent risks remain within acceptable limits of tolerability. The forecast capital expenditure has been included within this pricing proposal (see Section 5.8.5).

[1212] Warragamba Dam has been excluded from the PRA due to other comprehensive studies on this dam currently underway.

2.3 Proposed service levels for the 2020-24 Determination period

WaterNSW's proposed service levels for the 2020-24 Determination period are based the obligations set out in our operating licence. As discussed in Section 6.6.3.1 we have incorporated into this submission the costs associated with additional water quality monitoring activities as requested by our largest customer, Sydney Water.

3 Customer engagement

This section outlines WaterNSW's approach to engaging with customers during the preparation of our proposal.

3.1 Sydney Water

WaterNSW's revenue is a significant input cost to Sydney Water's prices. The growth in end user demand and increase in Sydney Water's customer base also have an impact on WaterNSW's supply planning. Throughout the development of this proposal, and in the development of long-term water supply and drought supply options more generally, WaterNSW and Sydney Water worked closely to ensure proposed expenditure and investment programs maintain service levels at least cost and that sufficient investments are planned to cater for expected growth in water demand.

Regular meetings were held to update both parties on planning parameters, discuss financial market outlook and to ensure WaterNSW's regulatory proposal reflects the feedback from Sydney Water.

In addition, as set out in Section 1.5.2 above, WaterNSW and Sydney Water are currently engaged in a review of the Raw Water Supply Agreement.

3.2 Council customers

WaterNSW has supply agreements in place with Wingecarribee Council, Goulburn-Mulwaree Council and Shoalhaven Council. As part of the agreement, regular meetings are held to discuss a wide range of issues relating to water supply. In preparing this proposal, WaterNSW met with these Council customers on 17 June 2019 to outline:

- the key elements of our overall Greater Sydney proposal
- the elements of the proposal that affect Council customers, including an indication of the proposed price movements over the four-year period
- how customers can participate in, and provide feedback as part of, IPART's consultation processes for the determination.

WaterNSW has also been engaging with our council customers on our Levels of Service framework, which is an important input into our approach to asset management, drought resilience and long-term supply security planning.

3.3 Greater Sydney Customer Advisory Group

As required by clause 6.6 of WaterNSW's operating licence, WaterNSW established a series of customer advisory groups (CAGs) in July 2017, including a specific CAG for the Greater Sydney area. The customer representatives for this CAG are a mixture of customers relevant to the Greater Sydney Determination, Rural Valleys Determination and WAMC Determination[13].

In its first year, two meetings were held for Greater Sydney CAG on 8 September 2017 and 30 November 2017. Three meetings were held in its second year, on 6 September 2018, 28

[13] The members of the CAG were from Oberon Council, Energy Australia, Goulburn Mulwaree Council, Lower Nepean Hawkesbury River Water Users Association, Shoalhaven Water and Lithgow City Council.

November 2018 and 4 March 2019. The issues canvassed include system operations, asset maintenance, drought response and regulatory change updates as relevant to the Greater Sydney area.

WaterNSW also advises customers of service improvement initiatives. The Greater Sydney CAG will continue for the term of the operating licence (to 30 June 2022), with refreshed membership in July 2019 for the balance of the term.

3.4 IPART

WaterNSW adopted a 'no surprises' approach with IPART throughout the current determination period. Regular quarterly CEO level meetings were held to provide IPART with updates on WaterNSW progress against the current determination. Throughout the preparation period, discussions were held between WaterNSW and IPART officers to discuss significant issues that may impact on the pricing outcome for the next determination period (e.g. how to address uncertainty of projects that are triggered during the regulatory period).

3.5 Raw and unfiltered water customers

WaterNSW intends to write to all of our raw water and unfiltered water customers following lodgment of this submission to advise them of the proposed prices for the 2020-24 Determination period and how to participate in the IPART's consultation process.

4 Regulatory framework

WaterNSW is proposing a four-year determination period for the 2020-24 Determination. Due to uncertainty primarily relating to drought, we are facing investment risk on major projects which requires a rethink about how the regulatory framework addresses uncertainty.

WaterNSW is proposing a regulatory framework to apply to our 2020-24 Determination that is summarised in Box 4.1 below.

Box 4.1 – Summary of our proposed regulatory framework for Greater Sydney

- A **form of regulation** based on an overarching 'CPI-X' framework that is underpinned by IPART's cost 'building block' approach to calculating required revenues assuming a 'post-tax' real framework and the continuation of the maximum price caps
- A **four-year determination period**
- A **cost pass through framework** that addresses the costs associated with unanticipated external events such as regulatory, legislative and tax changes and catastrophic events
- The continuation of the current 'cost pass through' for **Shoalhaven transfers** while addressing an anomaly in IPART's pricing formula that results in the allowed cost of electricity being below efficient costs
- Regulatory mechanisms to address the financial risk of **Major Projects** that may be required to address drought and other significant events that may be triggered but where it may not be practical or possible to include in the determination due to cost, timing or scope uncertainty
- A **demand volatility adjustment mechanism** to manage potentially significant volume risks associated with drought
- The continuation of the existing formula-based arrangements for adjusting our prices for the operating modes of the **Sydney Desalination Plant**
- The potential continuation of IPART's **Efficiency Carryover Mechanism** (ECM).

These matters are discussed in the following sections.

4.1 Proposed form of regulation

IPART is the principal economic regulator in NSW. Its main functions are set out in the *Independent Pricing and Regulatory Tribunal Act 1992 (NSW)* (the IPART Act). Among other responsibilities, IPART determines the maximum prices to be charged for declared government monopoly services provided by water utilities, including WaterNSW as outlined in Box 4.2 below.

Box 4.2 – IPART Act pricing provisions

14 - Method of fixing maximum prices

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

(a) by fixing an average price for a number of categories of the service,
(b) by fixing a percentage increase or decrease in existing prices,
(c) by fixing an average percentage increase or decrease in existing prices for a number of categories of the service,
(d) by fixing a specified price for each category of the service (if any other manner is not considered appropriate).

15 - Matters to be considered by Tribunal under this Act

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

As highlighted in Box 3 above, IPART is required to consider and balance a broad range of stakeholder matters when setting prices, including:

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

In meeting the requirements of the IPART Act, IPART determined the following form of regulation in the WaterNSW 2016-20 Determination for Greater Sydney:

- the cost '**building block**' approach to determining allowed revenues using a 'post-tax real' framework

- a **price cap form of control** with price caps for individual water services.

IPART's building block approach, the approach to converting the revenue requirement into prices and the form of control are discussed below.

4.1.1 Building block framework

In its 2016-20 Determination, IPART applied the following building block framework to calculate WaterNSW's notional revenue requirement over the determination period. To apply this approach, IPART made decisions on the revenue WaterNSW would require in each year of the regulatory period, based on the following building blocks:

- the revenue required for **operating expenditure** over the period. This amount represented IPART's estimate of WaterNSW's forecast efficient operating, maintenance and administration costs

- an allowance for a **return on the assets** used to provide the regulated services. This amount represented IPART's assessment of the opportunity cost of the capital invested in WaterNSW by its owner and debt providers to ensure that it can continue to make efficient investments in capital in the future. The return on capital was calculated by multiplying an inflation indexed regulatory asset base by a rate of return on capital that excluded the impact of inflation, or a 'real' framework, so as to not double count the impact of inflation

- an allowance for a **return of assets** (regulatory depreciation). This allowance recognises that through the provision of services to customers, a water utility's capital infrastructure will wear out over time and therefore revenue is required to recover the cost of maintaining the regulatory asset base

- an **allowance for meeting tax obligations**. In determinations prior to 2016, IPART adopted a 'pre-tax' weighted average cost of capital (WACC) in calculating the return on the RAB, which effectively 'grossed up' the WACC by the statutory tax rate. As part of its 2016-20 Determination and for subsequent determinations, IPART adopted a post-tax WACC and calculated WaterNSW's tax liability as a separate cost building block as IPART considered this method more accurately estimates the tax liability for a comparable commercial business

- an **allowance for working capital**. This allowance represents the holding cost of net current assets, such as receivables.

The sum of the above building blocks represented IPART's view of our total efficient costs over the determination period, or the total revenue requirement as discussed in Section 11 'Revenue requirement'.

To promote certainty and transparency in the regulatory framework, we propose that IPART continue to use its current **'building block' approach** applied on a **post-tax real** basis to determine WaterNSW's required revenues for the 2020–24 regulatory period.

4.1.2 Approach for converting the revenue requirement into prices

Having calculated WaterNSW's notional revenue requirement for the 2016-20 Determination period, IPART then converts the notional revenue requirement into prices. To do this, IPART makes a number of decisions, including the following:

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

WaterNSW considers that IPART's approach for converting the notional revenue requirement into prices for the 2016-20 Determination was appropriate and proposes that the approach is continued for the 2020-24 Determination period.

4.1.3 Form of control

As previously outlined in Box 3, one of the matters that the Tribunal is required to have regard to when making a determination or recommendation under section 14 of the IPART Act is the approach to calculating the maximum price a water network can charge for its services, as outlined below:

> *(1) A determination of the Tribunal of the maximum price for a government monopoly service may fix that price in any manner the Tribunal considers appropriate, including the following:*
>
> *(a) by fixing an average price for a number of categories of the service,*
>
> *(b) by fixing a percentage increase or decrease in existing prices,*
>
> *(c) by fixing an average percentage increase or decrease in existing prices for a number of categories of the service,*
>
> *(d) by fixing a specified price for each category of the service (if any other manner is not considered appropriate).*[14]

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

IPART has indicated that it is open to considering alternative forms of control and has requested that WaterNSW provide our 'preferred or alternative form of regulation, such as a weighted average price cap' in our submission.[15]

WaterNSW is familiar with other forms of control, such as average price caps, weighted average price caps and revenue caps, but considers that the current maximum price cap approach implemented by IPART, combined with adjustments for changes in costs and sales as discussed in this section, is fit-for-purpose for Greater Sydney as it promotes pricing stability and is well understood by customers. We therefore propose maintaining the current approach to setting maximum prices for the upcoming determination.

As the legislative framework does not obviously allow for the introduction of a revenue cap, and the case for change away from the current price cap would require a separate review beyond the timeframes associated with the upcoming Greater Sydney determination, WaterNSW proposes that a **price cap continues to be the form of control** for the 2020-24 Determination period.

[14] Section 14 of the IPART Act as reproduced in Box 3.
[15] Note reference from SIP.

4.2 Length of determination period

One of the decisions that IPART is required to make as part of the 2020-24 Determination for WaterNSW is the length of the regulatory period. IPART makes a decision on the number of years that the maximum prices they set can be levied. The period often reflects the circumstances that apply to that utility at that time.

As outlined in IPART's November 2018 Guidelines for Water Agency Pricing Submissions[16], IPART considers the following factors when deciding on the length of the determination period:

- *the confidence we can place in forecasts*
- *the risk of structural changes in the industry*
- *the need for price flexibility and incentives to increase efficiency*
- *the need for regulatory certainty and financial stability*
- *the term of the operating licence (where applicable)*
- *the costs of a price review, and*
- *the benefits of aligning the determination with the price determination of related utilities.*

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

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

In the 2016-20 Determination, IPART decided on a four-year determination period to apply from 2016-17 to 2019-20. IPART also decided to set a four-year determination period for Sydney Water on the basis that IPART considered it was useful to align Sydney Water's and WaterNSW's price reviews, as WaterNSW's prices are a significant operating expenditure input into Sydney Water's prices (on average 8.8%).[17]

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

WaterNSW therefore proposes a **four-year determination period** starting on 1 July 2020.

However, as discussed in Section 4.5.5 below, we suggest that the length of determination period is reviewed in the light of how IPART addresses the cost, timing and scope uncertainty associated with major projects that are currently uncertain due to drought and or Government policy. If IPART is not able to adequately address the uncertainty, a shorter determination period (e.g. two or three years) may be more appropriate to manage the underlying risks.

4.3 Cost pass through framework

We consider that a well-functioning regulatory framework needs to ensure a reasonable sharing of risks so that a business can recover its efficient costs, meet customer obligations and remain financially viable. An important element of the regulatory framework is the inclusion of regulatory mechanisms that allow for significant unforeseen costs that are triggered by uncertain events to be addressed during the regulatory period.

[16] November 2018 *Guidelines for Water Agency Pricing Submissions*. Page 27.
[17] IPART 2016 Determination for WaterNSW's Greater Sydney operations. Page 14.

Cost pass through mechanisms have the potential to provide an appropriate balance in the allocation of risks between WaterNSW (to recover costs to attract sufficient investment in its network) and customers.

Under the current regulatory model, IPART sets WaterNSW's prices on a forward-looking basis for a defined period. Prices are set to be sustainable over the regulatory period. However, there will inevitably be uncertainties during the period where it is impractical (if not impossible) to forecast the efficient costs of these uncertainties at the time prices are set.

For example, the introduction of a new tax (or a repeal of an existing tax or a change to an existing tax rate arising from the Federal election), the introduction of a new legislative obligation or a natural disaster, even though they may materially increase or decrease the costs of providing regulated services, would not be adjusted for in IPART's regulatory framework within a regulatory period in the absence of a cost pass-through mechanism. If IPART's current approach to cost pass through was continued for the 2020-24 Determination, customers would not benefit from the repeal of a tax or a reduced tax rate until the subsequent (i.e. 2024) regulatory period.

IPART's approach to cost pass through is summarised below:

> *Under the current form of regulation, we set efficient operating and capital expenditure allowances for the regulatory period with an expectation that costs can fluctuate up and down, some new costs will arise, and some expected costs will not occur. If there is no bias in the forecasts, we would expect the gains from under spends to offset the losses from overspends over the long term.*
>
> *We consider our limited application of cost pass-throughs is working effectively at the moment. Under the current form of regulation, risk is shared between regulated businesses and customers to minimise the likelihood and cost of downside risk and maximise the likelihood and benefits of upside risk.*
>
> *Sydney Water clarified its proposed framework for a broader application of cost pass-through mechanisms, noting that its proposed framework includes both cost pass-through mechanisms for uncertain events as well as cost contingency schemes for material changes in project costs. While this clarification makes the proposal clearer, it does not affect the reasons we have for maintaining the current approach for passing through costs during the determination…*
>
> *Decision*
>
> *4 We have decided not to broaden our approach to cost pass-through mechanisms at this time (noting that we have extended the application of our cost pass–through approach to include Shoalhaven transfers in addition to Sydney Desalination Plant's additional costs when it operates).*
>
> *3.5.1 Reasons for our decision*
> *We consider that cost pass-through mechanisms should only be applied in exceptional circumstances. Box 3.3 outlines the circumstances under which we consider cost pass-throughs should apply.* [18]

We highlight that IPART's limited use of cost pass through differs to the comprehensive pass through framework in the National Electricity Rules (NER) that was developed by the Australian Energy Market Commission (AEMC) over many years and through an extensive customer engagement process. The outcome is a NER-based approach that provides a combination of 'general' and 'nominated' pass through events that is designed to ensure a fair sharing of risks between the business and its customers and that enables the business to recover its efficient costs.

A summary of the recent draft Australian Energy Regulator (AER) 2019-24 decision for the NSW distribution network service providers (DNSPs) is shown in Box 4.3 below.

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

Box 4.3 – Pass through events applicable to the NSW DNSPs

The National Electricity Rules (NER) prescribe the following pass through events for all distribution determinations:

- a **regulatory change** event
- a **service standard** event
- a **tax** change event
- a **retailer insolvency** event.

In addition to these prescribed events, other pass through events may be 'nominated' by a service provider for a regulatory control period. In its draft decision on the nominated pass through events to apply to Ausgrid for the 2019–24 regulatory control period, the AER also approved the following pass through events:

- an **insurer credit risk** event
- an **insurance cap** event
- a **natural disaster** event
- a **terrorism** event.

Source: AER *Draft decision – Ausgrid distribution determination 2019-24, Overview*. November 2018, Page 40.

We accept that there are differences between electricity distribution networks and water infrastructure businesses. However, most of the events outlined in Box 4.3 would appear to be equally relevant to WaterNSW.

If an infrastructure business is not provided with the opportunity to recover its efficient costs, as would be the case if there was a positive change event such as one of the events outlined in Box 4.3, there would be a diminishing of the incentive to invest in the network, which is not in the long-term interests of our customers.

The matters considered relevant by the AEMC in developing the NER should also apply to water infrastructure businesses in NSW. In particular, like electricity networks, water infrastructure businesses should be provided with:

- the reasonable opportunity to recover, in future regulatory years, the efficient costs they incur as a result of unexpected events. The inability to recover these costs would otherwise have a significant financial effect on the ability of water networks to invest in and operate their networks

- the ability to nominate pass through events when submitting their revenue proposals. This would provide an appropriate balance in the allocation of risks between water networks (to recover costs to attract sufficient investment in their networks) and end customers (to ensure that prices are no more than necessary to provide an appropriate level of service).

We are proposing that IPART consider a more expansive cost pass through framework that contains the following events:

1. a **regulatory change event** (comprised of a regulatory change event, service standard event and tax event)
2. a **catastrophic event** (comprised of a natural disaster event and a terrorism event)
3. a **Shoalhaven transfers event** (discussed in Section 4.4).

Definitions for the proposed 'regulatory change event' and 'catastrophic event, along with a discussion of the appropriate materiality threshold to apply to these events in provided in Appendix B.

We consider that each of the above proposed pass through events would meet IPART's specified circumstances where a cost pass through would apply and should be a core feature of IPART's determinations to ensure a fair sharing of risks while enabling businesses to recover their efficient costs within a determination period.

Our proposed pass through framework includes the following features:

- a **symmetric framework** that applies for both positive and negative cost events
- a **materiality threshold** (for regulatory change events and catastrophic events) of **2.5%** of the annual revenue requirement, which would only be triggered if there was a change in costs of approximately $5 million.

We note that in the IPART 2016-20 Determination for Sydney Water, there was some contention as to whether there are constraints in the IPART Act that limit IPART's ability to implement cost recovery mechanisms. The above proposed cost pass through framework assumes that IPART is able to implement a robust cost recovery framework to pass through the efficient costs of complying with a regulatory event within a regulatory period if IPART is satisfied that doing so would be in the long-term interests of customers.

If IPART considers that there is a legislative constraint that limits it from determining a cost pass through framework to provide WaterNSW with the opportunity to recover its efficient costs by adjusting prices within a regulatory period for events such as complying with a new regulatory obligation or tax change, we request that IPART highlight its concerns in its draft and final reports and that these be addressed for subsequent determinations.

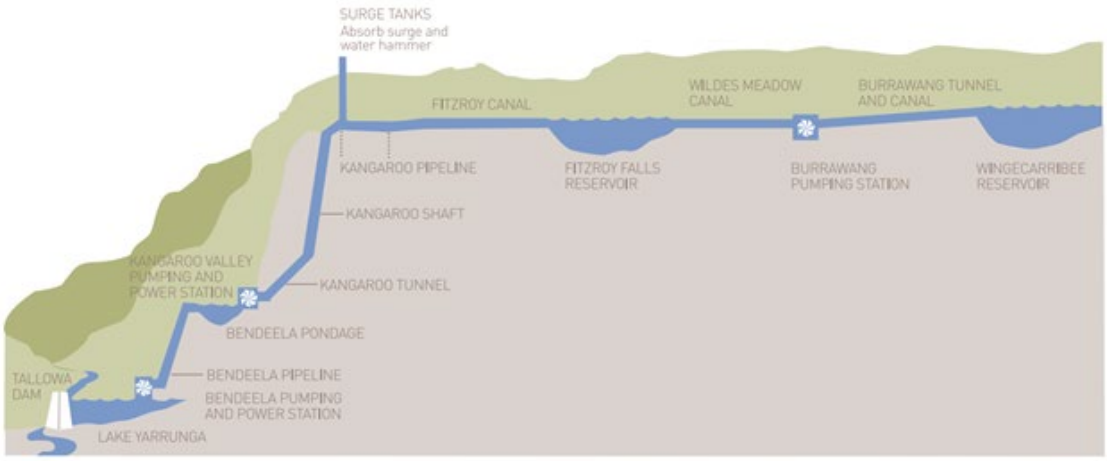
4.4 Shoalhaven transfers

4.4.1 Overview

The Shoalhaven Transfers Scheme (the Scheme) enables water to be pumped by WaterNSW from Tallowa Dam to the Upper Nepean dams and Warragamba Dam to supplement existing water supply to the Sydney and Illawarra water supply systems.

The Scheme is energy intensive. It includes hydro-electricity power generation and various pumping stations owned and operated by a third party. These facilities enable water to be pumped between Lake Yarrunga and Fitzroy Falls Reservoir and to Wingecarribee Reservoir, at WaterNSW's request, as shown in Figure 4.1 below.

Figure 4.1 – Shoalhaven transfers scheme



Source: WaterNSW

Under the NSW Government's 2017 Metropolitan Water Plan, pumping is triggered when total dam storage levels in the Sydney system is less than 75% and continues until total storage level reaches 80%.[19] More intensive pumping is triggered when total dam storage levels are less than 35%.

WaterNSW has contracted with a third party for the provision of pumping services under the Scheme. WaterNSW's contract with the third party governs the cost of energy incurred by WaterNSW for Scheme pumping as part of the requirements of the 2017 Metropolitan Water Plan.

In its 2016-20 Determination, IPART introduced a cost pass-through mechanism for Scheme transfers. That is, the cost of Scheme transfers is not included in the operating expenditures used to set maximum prices. This recognised the uncertainty associated with forecasting the incidence of the transfers and was intended to provide a signal to Sydney Water about the costs of supply augmentation in times of increased water scarcity.

In arriving at its approach to setting a price for Scheme transfers, IPART noted that WaterNSW incurs additional costs when transfers occur. The IPART mechanism intended to mirror, as closely as possible, the expected cost that would be incurred by WaterNSW under its contract with our retailer. As these transfers are activated by total system storage levels as set out in the 2017 Metropolitan Water Plan (and hence are determined by factors such as weather conditions), they can be difficult to predict. IPART intended the 'pass-through' mechanism to address such uncertainty.

Figure 4.2 below reproduces IPART's current formula for determining the costs of Shoalhaven transfers defined in Box 8.2 from the 2016-20 Determination. The formula multiplies average monthly off-peak energy prices in $/MWh by the number of megalitres transferred from the Shoalhaven system.

The formula was intended to approximate the actual cost incurred by WaterNSW that will pass through to Sydney Water for each month when water is transferred.

[19] Page 28 https://www.planning.nsw.gov.au/-/media/Files/DPE/Other/About-us/Metropolitan-Water/2017-Metropolitan-Water-Plan.pdf?la=en

Figure 4.2 – IPART's formula for passing through the cost of Shoalhaven transfers

Box 8.2 Cost of Shoalhaven transfers (CST)

$$CST = RRP \times 1.96MWh/ML \times STV$$

Where:

RRP is the NSW regional reference price for the 18 half-hourly periods from 10:00pm to 07:00am averaged over each month, in $/MWh, as reported by the Australian Energy Market Operator.

STV (Shoalhaven transfer value) is the number of MLs transferred from the Shoalhaven system.

$1.96MWh/ML$ is the composite usage rate factor in MWh/ML for the Shoalhaven system.[a]

[a] Email to IPART, WaterNSW, 18 February 2016.

Source: IPART, Review of prices for WaterNSW, From 1 July 2016 to 30 June 2020, Final Report, June 2016 page 74.

While WaterNSW supports the continuation of a separate price for Scheme transfers from the current determination, we wish to point out the following issues with the existing approach:

- it has become evident that IPART's pricing formula does not include all relevant charges (as outlined below) relating to the retailing of electricity and therefore the allowed cost of electricity is below efficient costs
- we are seeking to recover the revenue shortfall associated with the current formula. This is consistent with the intent of treating Shoalhaven transfers as a 'cost pass through,' rather than a price pass through whereby a pre-determined price (that does not reflect efficient costs) is applied to actual volumes. As discussed below, we are looking to do this through an adjustment to the pricing formula provided in Appendix D.

4.4.2 Adjustments required to IPART's formula

We consider that IPART's pricing formula does not achieve the intended outcome of cost reflectivity.

This is on the basis that the IPART pricing formula only captures the MWh Regional Reference Price (RRP) for NSW, as reported by the Australian Energy Market Operator (AEMO) in periods of off-peak pricing. WaterNSW understands that the RRP used by IPART reflects the typical spot price paid to a generator for off-peak electricity purchases.

However, as noted by SDP in its submission to the 2011 IPART efficiency report, and AEMO spot prices only capture the wholesale cost of electricity, and do not include:

- network 'poles and wires' costs
- environmental costs (e.g. Cost for complying with Renewable Energy Schemes)

- retailer and residual administration costs
- transmission losses.[20]

Following a detailed review of the allowance, it has become evident that the pricing formula does not include specific charges that would normally be included in efficient retail charges for electricity and which are reflected in the monthly electricity bill generated by our retailer for WaterNSW under the Scheme.

These charges are typically published and/or determined by an independent statutory authority or determined through the market, and hence WaterNSW is not able to influence the resulting costs in any way.

WaterNSW has also identified minor differences between IPART's calculation of the monthly average RRP and the RRP costs incurred under our contract with our retailer.

WaterNSW proposes that while a formula-based approach to calculating a price for Scheme transfers is appropriate, the formula needs to be updated to include all required components of retail electricity charges.

Appendix D provides our detailed workings of our proposed amendments to the formula for the cost of Scheme transfers relating to the electricity charge.

The impact of the above charges being excluded from the current formula is significant. In one month alone when transfers occurred (December 2018), WaterNSW's costs exceeded IPART's allowance by over 31%, or $0.7 million.

As outlined in more detail in Appendix D, and assuming the same price differential observed in December 2018, WaterNSW could incur a revenue shortfall of up to $1,372,000 per month (for 35,000 MLs pumped) in times when the Scheme is activated. This would have significant financial implications for WaterNSW and would promote perverse incentives for the operation of the scheme if not corrected.

4.4.3 Passing through the costs of the Shoalhaven transfers

While we support IPART's approach to charging for Scheme transfers (with the adjustments to the formula for other retail electricity-related charges noted above), for it to be considered a cost 'pass through' in the conventional sense (rather than a price pass through adjustment), we need to have the ability to pass through efficient costs that are higher or lower than those forecast by IPART.

As noted above, and due to the pricing formula for the transfers not reflecting the efficient retail cost of electricity, we are forecasting a $4.2 million shortfall in revenues during the current regulatory period (see Appendix D, Table D.3). WaterNSW proposes to recover this shortfall (including efficient funding costs) as part of the 2020-24 Determination through a specific adjustment to the Shoalhaven transfers pricing formula as discussed in Appendix D.

[20] https://www.aemc.gov.au/energy-system/electricity/electricity-market/spot-and-contract-markets. Also see page 41 *Review of Operating and Capital Expenditure by Sydney Desalination Plant Pty Ltd: Review Report Halcow, October 2011* https://www.ipart.nsw.gov.au/files/sharedassets/website/trimholdingbay/consultant_report_-_review_of_operating_and_capital_expenditure_by_sydney_desalination_plant_pty_ltd_-_halcrow_-_october_2011-_website_document.pdf

4.5 Addressing the uncertainty of major projects

WaterNSW faces timing and cost uncertainty surrounding significant investment programs (referred to as 'major projects') that are not included as part of this pricing proposal other than for some specifically identified planning expenditure as outlined in Section 5 'Capital expenditure'.

Each of these major projects has the potential to significantly increase the financial risk to WaterNSW during the 2020-24 Determination period. Furthermore, uncertainty around the likelihood, timing and cost of these major projects may impact on the accuracy of our forecasts and the confidence IPART can place on them.

The continued effect of drought and the development of a Drought Management Options Study[21], triggered under the 2017 Metropolitan Water Plan to commence when dam storage levels reached 60%, suggests that as dam levels continue to fall, WaterNSW will be required to initiate response measures in a timely manner and may be required to commence construction within the 2020-24 Determination period. In addition, significant investment may be required to ensure water security and dam safety.

These options are identified in **confidential** Appendix C.

We therefore propose a number of regulatory mechanisms to address the financial risk of major project options that may be required but that are not provided for in the 2020-24 Determination due to cost, timing or scope uncertainty.

We propose to address the risks of major projects as follows:

1. The introduction of a NEM-style **contingent projects** mechanism as WaterNSW's first preference. If IPART considers it is unable or unwilling to introduce a contingent projects mechanism under its current legislative framework, we then propose the following approaches to address the uncertainty

2. Incurring the expenditure and including it in the **roll-forward of the RAB** (including an allowance for funds used during construction) to be included in prices for the 2024 Determination. We note that this approach would not address the cashflow impacts and our credit worthiness during the 2020-24 Determination as the costs would not be included in prices until 1 July 2024. This approach does, however, align to the approach adopted for the Broken Hill Pipeline. The impacts on WaterNSW's ability to finance these projects in the interim make this option suboptimal

3. Setting a **shorter (e.g. two or three-year) regulatory period**. We still carry revenue risk under this approach as we don't know when the event trigger will occur.

One or more of the above mechanisms needs to be incorporated in the determination to enable WaterNSW to recover its efficient costs if a major project is triggered during the 2020-24 Determination period.

As discussed below, we do not consider that the costs for the major projects can be reasonably forecast at the time we submit this pricing proposal and therefore are not appropriately addressed through IPART's current approach to cost pass throughs, whereby the costs of the event are assessed up front and a price path set if the project is triggered (e.g. consistent with IPART's application of its pass through framework as it applies to Scheme transfers and SDP pricing).

Our approach to managing the risk of major projects is discussed below.

[21] Refer to page 36 at https://www.planning.nsw.gov.au/-/media/Files/DPE/Other/About-us/Metropolitan-Water/2017-Metropolitan-Water-Plan.pdf?la=en

4.5.1 Proposed contingent projects and reopener schemes

The financial risk imposed on WaterNSW if one or more of major projects occurs is significant if the costs are not recovered through IPART's determination (and or via Government funding). Uncertainty around these significant expenditure programs requires that WaterNSW consider risk mitigation strategies to address the financial and revenue uncertainty.

We are seeking IPART to treat major projects as 'contingent projects' within IPART's regulatory framework. Currently **contingent projects** and capital expenditure **reopeners** are included in the National Electricity Rules (NER) for electricity networks:

- the **contingent project mechanism** allows the regulator to exclude from the forecast expenditure established in the review a project which is uncertain, but which has a clearly defined trigger event, but to include it later if it is required

- the **capital expenditure reopener mechanism** in the NER allows for the inclusion of additional capital when the network business spends at least 5% more than the opening RAB.

While the concept of a contingent projects has merit and would appear to be a candidate for addressing the WaterNSW major projects, it does not currently form part of IPART's regulatory framework and in the past has not been supported by IPART. [22] We consider, however, that the challenges arising from drought have fundamentally changed the operating environment and a rethink on the approach to managing uncertainty and risk is required for major infrastructure works.

4.5.1.1 Contingent project mechanism

The AER is required by the NER to assess applications by energy network service providers (NSPs) to amend their revenue determination to include the revenue required for a contingent project. The NER sets out the requirements for businesses to lodge applications and the obligations on the AER in assessing those applications.

A contingent project is a project assessed by the AER as reasonably required to be undertaken, but which is excluded from the *ex-ante* capital expenditure allowance in a revenue determination because of uncertainty about its requirement, timing or costs. A revenue determination also identifies associated trigger events.

Should the trigger event occur, an NSP may apply to the AER during the regulatory period to amend the revenue determination to include forecast capital expenditure and incremental operating expenditure for the project.

The threshold is the **greater of $30 million or 5%** of the annual revenue requirement in the first year.

WaterNSW proposes to treat major projects in our 2020-24 Determination as contingent projects by adopting the following steps in our initial submission:

1. identify the project to be included as a contingent project and the proposed trigger
2. establish that the contingent project capital expenditure is reasonably required, and:
    a. Is not provided in, and does not impact on, the approved capital expenditure for the determination, and

[22] Refer to IPART submission to AEMC's Rule change process – *Economic regulation provisions within the National Electricity Rules*. April 2012. Page 7.

b. Exceeds the greater of $30 million; or 5% of the annual revenue requirement in Year 1.

The contingent event provisions operate on a limited basis where the nature of the expenditure is forecast at the time of the business's revenue proposal but is contingent on a 'trigger event'.

These provisions operate on costs where the event that led to WaterNSW incurring costs was foreseen.

For unforeseen events, the NER also provides for a capital expenditure reopener as discussed below.

4.5.1.2 Capital expenditure reopener mechanism

For **capital expenditure reopeners** in the NER, the threshold for capital expenditure to rectify the adverse consequences of the event is 5% of the value of the roll-forward RAB for the first year of the regulatory period.

At the time of its consideration of a reopener for transmission networks, the AEMC indicated that the rules for the capital expenditure re-opener "*the capital expenditure re-opening provisions should be retained for 'large, **shipwreck-type events**'* (emphasis added).[23] This is reflected in the NER as the capital expenditure reopener is made subordinate to the cost pass through provisions (clause 6A.7.1(a)(7)), by explicitly prohibiting an application for a re-opener where expenditure is a cost pass through or contingent event.

However, there are a number of limitations to the operation of the capital expenditure reopener. It does not include operating expenditure and the materiality threshold is set much higher than the threshold for contingent projects (5% of the RAB). Further, under NER clause 6A.7.1 there are additional restrictions on the operation of the capital expenditure re-opener. These other restrictions are that:

- capital expenditure must be beyond the reasonable control of the business (clause 6A.7.1(1))
- capital expenditure must not be included in the forecast capital expenditure or contingent events (clause 6A.7.1(2))
- the business is unable reduce capital expenditure in other areas to offset the unforeseen capital expenditure (clause 6A.7.1(4)(ii))
- unforeseen capital expenditure event will increase the capital expenditure beyond the current allowance (clause 6A.7.1(5))
- the event would be likely to have a material adverse effect on the reliability and security of the network (clause 6A.7.1(6)).

Which mechanism is more appropriate in the circumstances of WaterNSW?

While both the contingent project mechanism and a capital expenditure reopener would have the effect of adjusting the determination for significant unforeseen events, there are important differences in the mechanisms that warrant consideration:

[23] AEMC Rule Determination - National Electricity Amendment (Cost pass through arrangements for Network Service Providers) Rule 2012. 2 August 2012, page ii.

- the contingent event provisions allow cost recovery from end consumers in relation to a specific event where the 'trigger event' is uncertain at the time of the initial revenue proposal

- subject to review by the regulator, the capital expenditure reopener permits the recovery of costs of unforeseen events as part of its regulated revenue/prices.

The mechanisms are designed to address different risks. The reopener mechanism sacrifices the certainty that would be gained by setting out defined events in advance, for the ease of assessing events after they have occurred.

WaterNSW considers that, in the longer term, both contingent projects and reopener provisions should form part of the regulatory framework for water infrastructure businesses to reflect an operating environment characterised by considerable investment uncertainty.

While contingent projects are common in the regulation of electricity networks, we are not aware of any capital expenditure reopeners having been approved by the AER. While we are proposing to classify the major projects identified in Table 4.1 below as contingent projects, we are not proposing a capital expenditure reopener for the 2020-24 Determination.

Table 4.1 – Contingent Projects

Name	Materiality Threshold met?	Trigger Mechanism
Drought Relief Measures	✓	Defined storage level; or Decision by Cabinet or the Minister
Other Projects	✓	Policy criteria for supply and demand are met, as defined in the upcoming NSW Government's Greater Sydney Water Strategy 2020; or Decision by Cabinet

Source: WaterNSW analysis

A detailed description of the above proposed contingent projects is provided in confidential Appendix C 'Major Projects'.

Alternatively, IPART may find the flexibility and discretion available to it under a capital expenditure reopener attractive. On this basis, WaterNSW supports the adoption of either a contingent projects regime or a capital expenditure reopener (although our preference is that both mechanisms are adopted as they address slightly different uncertainties as discussed above).

4.5.2 Include in regulatory asset base for subsequent determination

If IPART does not provide for the costs of major projects through either a contingent projects mechanism or a cost pass through, WaterNSW proposes that the capital costs could be added to the RAB, plus an allowance for funds used during construction, that would form part of the opening RAB for the subsequent (i.e. 2024) determination.

While this approach has the benefit of providing a return on investment that is preserved in net present value (NPV) terms, it does not provide any cashflow to offset the funding costs of the investment over the current regulatory period. Given the potential scale of the major projects, this lack of cashflow during the 2020-24 Determination period could have significant implications on our ability to meet our fiduciary duty to our shareholder and to maintain our credit worthiness.

The approach also introduces the regulatory risk of an *ex post* review once investments have already taken place.

On this basis, we would only see this approach as a last resort regulatory option for addressing the uncertainty of a major project and or if the project was triggered in the last year of the regulatory determination period.

4.5.3 Reduce the length of the regulatory period

Depending on the approach adopted by IPART to manage the uncertainty of major projects, it may be appropriate to review the length of the determination period. As noted above, WaterNSW proposes a four-year determination period, but notes that if the regulatory mechanisms to address uncertainty are not sufficient to mitigate financial risk, we would seek the opportunity to propose a shorter regulatory period.

The decision to reduce the length of the determination period is not without precedent but should not be taken lightly, as it will significantly contribute to higher regulatory compliance costs and an increased workload for IPART, WaterNSW, Sydney Water and end customers (if the decision to apply a shorter period is also extended to Sydney Water).

We note that IPART in its draft decision for the Broken Hill pipeline (the costs of which form an input to Essential Water's cost base) was shortened from a proposed four-year determination to a three-year determination on the basis of cost uncertainty associated with a sewerage treatment plant investment for Essential Water:

> *Although we see benefits in adopting a 4-year determination period, we consider there is a stronger case for aligning the determination periods for the Pipeline and Essential Water.*
>
> *There are strong linkages between the prices set in the Essential Water price review and the prices set in the Pipeline price review. Aligning the reviews would provide end consumers with greater certainty over prices and bill impacts. There are also benefits in conducting joint public consultation for the two reviews. Therefore, because we have made a draft decision to adopt a 3 year determination period for Essential Water, we have also opted for a 3-year period for the Pipeline.*[24]

Depending on the holistic approach undertaken by IPART to manage the financial risk associated with the cost and timing uncertainty of major projects, reassessing the length of the regulatory period with a view to shortening the period may be appropriate for this determination.

4.5.4 Cost pass through for major projects

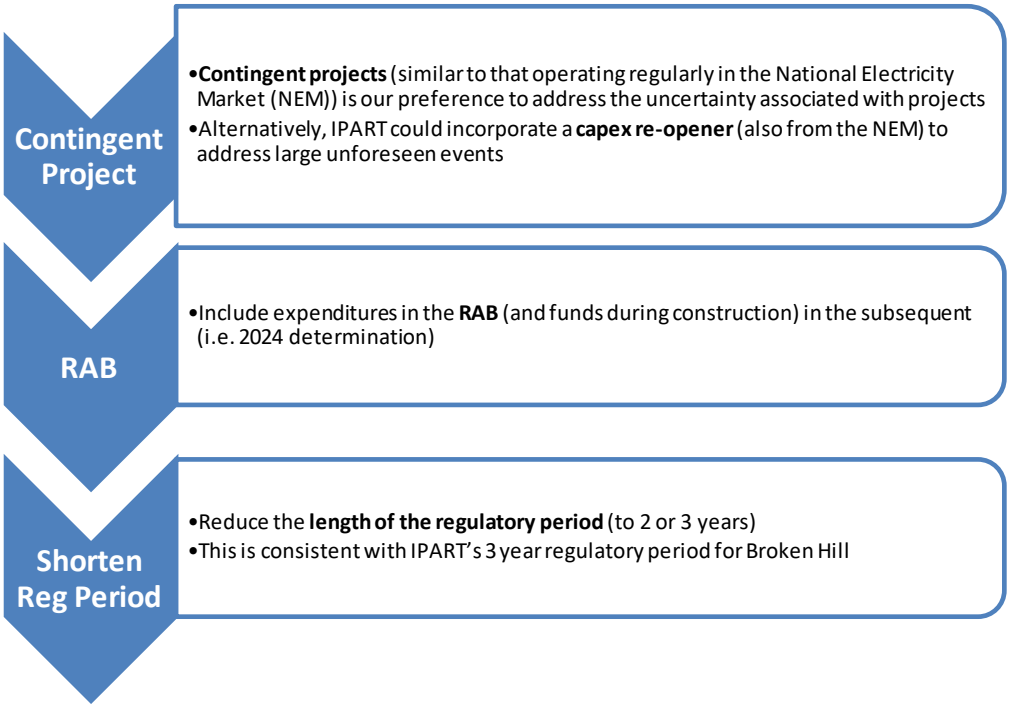
Under the cost pass through approach, if the project is triggered, WaterNSW would charge the price approved in the determination based on a preliminary ex ante forecast of the costs for the respective major project. Under this mechanism, we could seek to adjust prices in the subsequent (i.e. 2024) regulatory period based on actual costs incurred and updated forecasts.

We do not consider that IPART's current approach to cost pass throughs is appropriate to address the significant scope costs and cost uncertainty for major projects. This is on the basis of the high degree of uncertainty around the cost estimates at the early stages of the planning cycle for each of these projects makes an initial assessment by IPART and its technical consultant of the costs highly speculative.

In summary, our preferred approach to addressing the risk of major projects is through a contingent projects regime as outlined in Section 4.5.1 above and as illustrated in Figure 4.3 below:

[24] IPART Draft Report for the Murray River to Broken Hill Pipeline, 2 April 2019. Page 15.

Figure 4.3 - Framework for addressing uncertainty of major projects



4.6 Demand volatility allowance mechanism

WaterNSW proposes that a demand volatility adjustment mechanism for customer consumption be introduced for the Greater Sydney 2020-24 Determination. This mechanism is aimed to mitigate the possible over or under-recovery of revenues due to material variation between the level of actual sales over the determination period and the sales forecast used in making the determination.

WaterNSW proposes effectively the same mechanism incorporated in the Sydney Water, Hunter Water and Central Coast Council reviews undertaken by IPART. We also support that a material variation in sales be defined as a ± 5% change over the determination period.

A demand volatility adjustment mechanism is a useful and important feature of IPART's regulatory framework to provide an appropriate level of certainty to WaterNSW and its customers on how future revenues and prices are to be calculated.

When determining prices for WaterNSW, Sydney Water and Hunter Water, IPART makes forecasts of the level of water it expects them to sell over the determination period. If actual sales differ from our forecasts, then revenues will be impacted. One way of taking account of this risk is to use a mechanism that compensates the utility for such losses (or adjusts for such gains) at the next determination of its prices. If this mechanism is based on the impact of water sales on revenue it is called a 'demand volatility adjustment mechanism'.

In the 2016-20 Determination, IPART stated:

> *For our 2016 determinations for Sydney Water and Hunter Water, we have decided to introduce a demand volatility mechanism.*
>
> *Under this approach, at the next determination prices we will consider an adjustment to the revenue requirement and prices to address any over- or under-recovery of revenue over the 2016 determination period due to material variation between the level of actual water sales and the*

> *forecast water sales used in making the determination. A material variation is defined as more than 5% (+ or -) over the whole determination period.*
>
> *We also considered this issue for WaterNSW's Determination. We consider that such an adjustment is not warranted for WaterNSW because only 20% of its sales are recovered by its volumetric charges. Therefore, 80% of its revenue from fixed charges is not impacted by changes in demand. As well, we have reduced some risk to WaterNSW's revenue with the introduction of a formula that adjusts WaterNSW's volumetric price to Sydney Water to reflect the SDP's mode of operation (see Chapter 8).*[25]

It is true that WaterNSW is able to manage volume risks in the Greater Sydney area to some extent though its tariff design (with its relatively high fixed charges), and there is some protection from the operation of the SDP (which we discuss in Section 4.7).

However, we do not support the economic rationale for IPART to not provide a demand volatility adjustment for WaterNSW. This is on the basis that whether to include a demand volatility adjustment should be a separate consideration from the likelihood that the mechanism will be triggered.

We agree with IPART that adjusting the revenue requirement and prices to address any over- or under-recovery of revenue due to changes between the level of actual water sales and the forecast water sales is the primary consideration. For the same rationale as applied by IPART to Sydney Water, Hunter Water, Central Coast Council and Essential Water, we think that applying a demand volatility adjustment to WaterNSW is an appropriate 'no regrets' approach.

Regarding the likelihood that the mechanism would be triggered, we agree that the likelihood is reduced (but not eliminated) by both our tariff design and the approach to SDP pricing. We also consider that having a mechanism that provides a reasonable sharing of volume risks with customers is an important risk management tool, particularly in the light of uncertainty around the continued effects of drought for Greater Sydney. It is not inconceivable that the introduction of severe water restrictions could lead to significant water sales declines to Sydney Water. Having a mechanism that operates in extreme circumstances is an important regulatory tool – it would be much better to have the mechanism and not need it, than to need the mechanism and not have it available to manage volume risk.

We also note that linking tariff design to the availability of a demand volatility adjustment creates undesirable incentives. For instance, while tariff design is a key tool in managing volume risk, suggesting that a demand volume adjustment mechanism is linked to the proportion of fixed charges (i.e. would only be provided if usage charges are a high proportion of total revenues) does not send the appropriate pricing signals to infrastructure operators as it would encourage the move to more usage-based tariff levels that may not be efficient. The corollary is that if WaterNSW introduced a pricing structure with greater variable costs, resulting in greater revenue volatility, IPART would appear willing to support the introduction of a demand volatility adjustment that may reduce our overall risk profile. This outcome would be nonsensical.

As illustrated below, and with the exception of our Murray River to Broken Hill Determination, the 2016-20 Determination is IPART's only major water determination that does not incorporate a demand volatility mechanism.

[25] IPART, Review of prices for WaterNSW, From 1 July 2016 to 30 June 2020, Final Report, June 2016, Page 58.

Table 4.2 – IPART water determinations with a demand volatility adjustment

IPART Determination	Volatility Adjustment?	Materiality Threshold?
Sydney Water 2016	✓	✓ ±5% of revenue
Hunter Water 2016	✓	✓ ±5% of revenue
Central Coast Council 2019	✓	✓ ±5% of revenue
Essential Water 2019	✓	✓ ±5% of revenue
WaterNSW (WAMC) 2016	✓	× IPART's discretion
WaterNSW (Rural Valleys) 2017	✓ Volatility Allowance	N/A
WaterNSW (Greater Sydney) 2016	×	N/A

Source: WaterNSW analysis

WaterNSW proposes a demand volatility adjustment mechanism with the materiality threshold of ±5% of revenues to WaterNSW in the 2020-24 Determination period.

4.7 Addressing Sydney Desalination Plant operation

To accommodate the possibility of changes to the SDP operating regime (e.g. including in a 'low flow' mode, where it may be operating at level less than full production), in its 2016-20 Determination IPART applied a pro-rata equation (charging formula). The charging formula calculates a volumetric price charged to Sydney Water for each megalitre (ML) of water supplied in each month.

To apply the charging formula to calculate the volumetric price to Sydney Water each month, IPART provided:

- the Target Revenue (TR) from prices to be recovered from Sydney Water each month through the volumetric charge
- the monthly average of forecasts sales.

IPART's formula-based approach to calculating the volumetric charge to large customers, (i.e. Sydney Water), reflects all possible modes of operation of SDP.

IPART's charging formula is provided Figure 4.4 below, which reproduces Box 8.3 from IPART's Final Report for 2016-20 Determination.

Figure 4.4 – IPART formula for SDP pricing

Box 8.3 Volumetric price for large customers ($/ML)

$$Volumetric\ price = \frac{20\% \times TR}{(FS - Q_{SDP})} + \frac{CST}{AS}$$

Where:

- TR is the target revenue requirement from prices to be recovered from all large customers[a] for the relevant month (as listed in the determination)
- FS is forecast water sales (ML) to all large customers for the relevant month (as listed in the determination)
- Q_{SDP} is actual water supplied (ML) from SDP to all large customers in the relevant month, however if:

$$Q_{SDP} \geq FS, \text{ then the volumetric price to SWC is nil}$$

- AS is the actual sales (ML) from WaterNSW to all large customers in the relevant month, and
- CST is the cost of Shoalhaven transfers in the relevant month defined in Box 8.2.

[a] Currently Sydney Water is WaterNSW's only large customer.

Source: IPART, Review of prices for WaterNSW, From 1 July 2016 to 30 June 2020, Final Report, June 2016, page 75.

The 2017 Metropolitan Water Plan established the operating rules for SDP. SDP was in Water Security Mode (not in production) until the combined water storage levels in the major fell below 60%. This occurred on 27 January 2019. When fully operational, SDP produces 90,000 ML/year of water or approximately 15% of Sydney Water sales.

We understand that under a long-term water supply agreement, Sydney Water is required to 'take or pay' SDP water in the first instance. Due to the ongoing effects of drought, we have assumed that SDP will be fully ramped up in early 2019-20 and will continue operating at full capacity throughout the 2020-24 Determination period for our indicative 'SDP on' scenario.

WaterNSW proposes to **replicate the current SDP formula** for the 2020-24 Determination period.

The prices associated with SDP in fully operational mode are provided in Section 12.1.1.

4.8 Proposed incentive schemes

This section outlines WaterNSW's proposals relating to IPART's Efficiency Carryover Mechanism (ECM) and the Annual Water Quality Incentive Payment (AWQIP).

4.8.1 Efficiency carry-over mechanism

In its 2015 pricing proposal to IPART, WaterNSW supported the implementation by IPART of an efficiency sharing and incentive mechanism (it was called an 'Efficiency Benefit Sharing Scheme'). The proposal was for a symmetric scheme that included a 5% cap and collar limiting

the incentive to 5% of operating expenditure, excluded non-controllable costs and was based on a 4-year carryover period.

In its Final Decision for the 2016-20 Determination, IPART stated that it intended to implement an 'Efficiency Carryover Mechanism' (ECM) at WaterNSW's 2020 price review to apply to operating expenditure (i.e. the ECM did not apply to capital expenditure). This was consistent with its decision to introduce an ECM for Sydney Water and Hunter Water Corporation.

The ECM is intended to provide a regulated business with an incentive to be efficient and find permanent operating expenditure savings consistently throughout the regulatory period, thereby removing the inherent bias to cut costs in the early years and ramp up costs in the later years of a regulatory period.

The ECM is intended to reward businesses by providing allowing permanent cost savings to be retained by the business for four years, regardless of the year in which the saving occurs.

4.8.1.1 Application for a carryover under the ECM

Even though WaterNSW has achieved significant cost savings over the 2016-20 Determination period, we are not proposing to include an ECM carry forward in our proposed 2020-24 Determination period revenues on the basis that:

- WaterNSW's motivation to achieve efficiency gains is not driven by the ECM per se; rather we seek to provide secure, high quality water at the lowest price for our customers consistent with our statutory obligations

- we do not consider that carrying forward additional costs to the 2020-24 Determination period arising from efficiency savings in the current period is appropriate in time of drought.

The significant cost savings we expect to achieve during the current determination period are driven by Management's motivation to achieve efficiencies and not directly by the incentives of the ECM. Therefore, as *a priori* price levels would be lower in the 2020-24 Determination period if we did not apply for an ECM carry forward, WaterNSW is not applying for a carry forward.

4.8.1.2 Application of the ECM to capital expenditure

In response to IPART's request that we consider the merits of extending the ECM to capital expenditure[26], WaterNSW has considered a number of factors, including the following:

- a capital ECM would presumably (at best) be applicable to recurrent capital expenditure or approximately 25% of our overall capital expenditure program

- the lumpy nature of the WaterNSW capital expenditure program means that there can be significant shifts from year to year. The factors for swings can be related to the stage of the investment asset life-cycle and government-directed investment, rather than efficiency

- we query the scope for efficiency savings in capital expenditure given that:
    - capital expenditure construction is procured from third parties

[26] IPART letter to WaterNSW December 2019.

  - the market-testing of procurement results in the most efficient provider delivering the works. This reduces the need for extending the ECM to capital expenditure as it is already market tested and efficient

- the ECM does not help to demonstrate whether a capital expenditure project/program is prudent. This is demonstrated by our governance, decision-making and planning processes. Therefore, an ECM for capital expenditure will not improve the prudency of the investment or remove the need for regulatory scrutiny of the capital expenditure program at each reset.

From our analysis, we do not consider that extending the ECM to include capital or advocating an alternative capital incentive scheme (such as the AER's Capital Expenditure Sharing Scheme), would improve incentives for capital efficiency or result in improved outcomes for the organisation and its customers.

On this basis, WaterNSW proposes that the ECM not be extended to capital expenditure.

4.8.1.3 Raw water supply agreement

WaterNSW and Sydney Water are moving towards agreeing the terms of a new Raw Water Supply Agreement (RWSA) that will include a performance payment mechanism. The performance payment will focus on asset availability and configuration activities. In addition, the parties have agreed to collaborate over the coming period to establish appropriate baseline metrics for the future incorporation of water quality based performance mechanisms / payments. We expect to finalise the new RWSA in 2019-20 and will advise IPART of the outcomes.

5 Capital expenditure

We propose to invest $682 million in 2020-24 to continue to provide the availability of water resources that are essential for our Greater Sydney customers and to make the water network more resilient and secure.

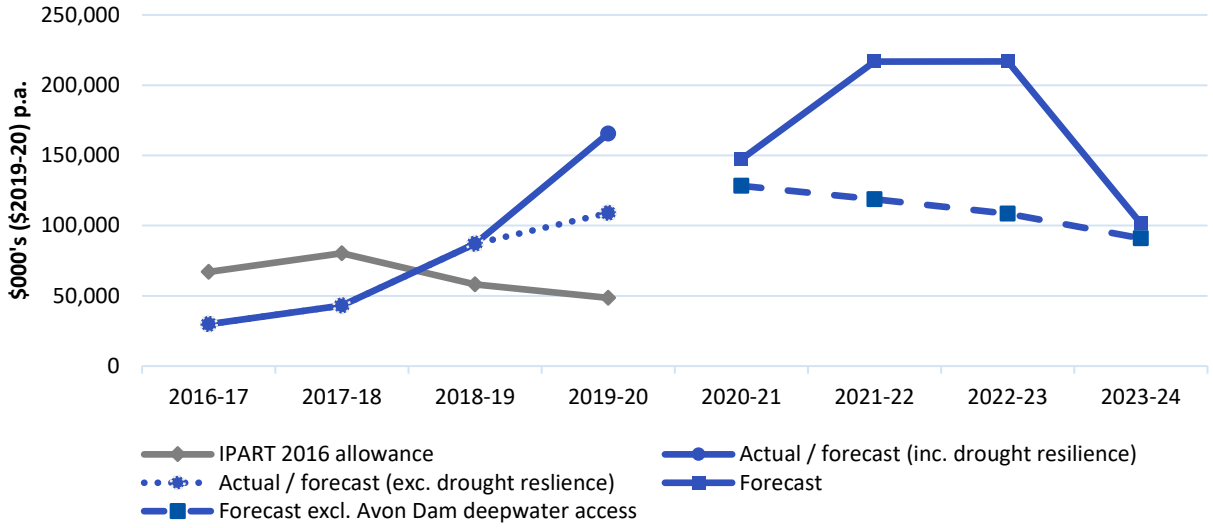
5.1 Summary of capital expenditure proposal

WaterNSW is proposing to invest $682.4 million ($2019-20)[27] of capital over the 2020-24 Determination period. The capital expenditure program underlying this forecast includes capital programs to help mitigate some of the risks associated with the extended dry conditions being experienced in NSW.

The proposed forecast will allow us to continue to provide the availability of water resources that are essential for our Greater Sydney customers and that comply with our operating licence.

Our proposed capital expenditure for the 2020-24 Determination period compared to historical expenditure and IPART's total allowance for the 2016-20 Determination is provided in Figure 5.1 below. The proposed capital program is shown both including and excluding our largest proposed project – deep water access at Avon Dam at an estimated cost of $236 million to assist in providing drought resilience and address the supply risk to the Illawarra region by enabling access to the deep inaccessible water in the reservoir.

Figure 5.1 – Capital expenditure allowance and actual capital expenditure 2016-17 to 2019-20, proposed capital expenditure 2020-21 to 2023-24 ($000s, $2019-20)



Source: WaterNSW

Our proposed total capital expenditure of $682 million represents a $357 million, or 110%, increase over our actual / forecast expenditure in the 2016 regulatory period. The forecast capital expenditure for the 2020-24 Determination period includes planning for drought resilience measures in the earlier years.

[27] All dollar figures are in $2019-20 unless stated otherwise

The capital expenditure forecast has been centred on addressing five key categories of need necessary to continue delivering essential water services to our customers. We have allocated our proposed capital program into the service need categories. These programs are further described in Section 5.8.1.

The five key areas of investment service need are illustrated in Figure 5.2 below.

Figure 5.2 – Five areas of service need driving capital expenditure

Source: WaterNSW

WaterNSW's proposed capital expenditure by service need category for the 2020-24 Determination period is shown in Table 5.1 below.

Table 5.1 – Proposed capital expenditure by service need category, ($millions, $2019-20)

Service need category	2020-21	2021-22	2022-23	2023-24	Total
Water infrastructure renewals	55	48	46	50	200
Water supply security and reliability	49	104	114	14	281
Water quality, catchment protection and environment	15	42	33	23	113
Dam safety compliance	13	15	18	8	53
Business capability and enablement	15	7	7	6	36
Total	**147**	**217**	**217**	**101**	**682**

Source: WaterNSW

The proposed forecast has been developed on a bottom-up, project-by-project basis and justified for need, timing, cost and efficiency. This has been overseen by executive management and Board scrutiny of the overall forecasts to ensure that price impacts to customers are minimal.

Our planning, asset management, forecasting and governance processes provide assurance that the capital expenditure forecasts are prudent and efficient.

5.2 Performance in the current regulatory period

5.2.1 Business improvements

WaterNSW has implemented business improvement initiatives consistent with our strategic goal to consistently deliver and continuously improve core performance.

WaterNSW asset management and delivery capability

WaterNSW has implemented a new approach for asset management and delivery of capital works. This includes dedicated teams for determining long, medium, and short-term asset needs, with an increased focus on the requirements of customers.

The delivery team has been restructured to allow for increased delivery capability and scalability across the combined business. This includes an adaptive model allowing resources to be directed to priority areas across the portfolio, and to be efficiently supplemented by external resources as required.

The delivery model is centred around three broad delivery competencies:

- project management – for overall accountability for project delivery
- project engineering – responsible for managing technical aspects of the project including design and commissioning
- construction management – for quality, safety and environmental management.

In addition, a program level delivery function has been established to better manage future resourcing needs based on the project pipeline.

Procurement

WaterNSW has adopted a panel-based procurement model for delivery of the majority of maintenance capital program. This includes early contractor engagement to leverage market knowledge and experience on project delivery. The approach has proven beneficial for delivery of larger projects within the program. Smaller projects have been bundled into mini-programs and this has aided delivery and engagement of panel members. The changes have enhanced the effectiveness and efficiency of project and program procurement processes.

WaterNSW is currently reviewing its longer-term approach to the procurement of capital maintenance works under a program-based procurement model, in line with many other water utilities across Australia. A program-based procurement model makes the work more attractive to potential suppliers as it provides continuity and more efficient use of resources.

Asset decision-making

A significant benefit of the changed structure for asset management is the increased capability of the team at WaterNSW to make prudent asset management decisions. This has delivered significant savings following internal reviews of the scope of projects developed prior to implementation of the new structure. Significant savings have been realised against projects on the Upper Canal, the Metropolitan Dams Electrical Upgrade, and the Warragamba Dam Reliability Upgrade.

The team is also using risk-based decision-making criteria to bring forward other projects. WaterNSW's risk-based prioritised approach has been used for the Nepean Pumping Station Upgrade and the proposed works on the Warragamba Pipeline Corridor. The asset investment processes at WaterNSW ensures that works are appropriately prioritised based upon risk to our business, customers and stakeholders.

Contingency management

A robust approach to project cost management has been developed including a probabilistic risk-based approach to contingency management. This is now implemented for all projects above $500,000 in value and is subject to review at each project's business case approval gateway.

5.2.2 Projects and programs

WaterNSW has delivered a number of important projects in the current determination period.

- **Burrawang Pumping Station** – WaterNSW completed a major overhaul of the Burrawang Pumping Station, including installation of new variable speed drives to increase efficiency, a substantial upgrade of electrical infrastructure, and renewal of the pumps.

- **Upper Canal Interim Works Stage 2** – these works were substantially completed in early 2019, with remaining works on fencing expected to be complete by the end of 2019. This project has delivered targeted structural renewals along the canal as well as drainage improvements. This project has resulted in the mitigation of the worst asset reliability issues along the Upper Canal, with subsequent works proposed to continue to improve asset performance including water quality management.

- **Nepean Deep Water Pumping Station** – a project to renew the variable speed drives, as well as upgrade control equipment was undertaken in 2018, resulting in substantial reliability improvements to the facility, with the asset successfully returned to service in time to undertake critical bulk water transfers as Greater Sydney transitioned into drought conditions.

- **Metropolitan dams electrical upgrade** – WaterNSW has delivered critical electrical renewals to improve the safety, reliability and serviceability of electrical infrastructure across the metropolitan dams.

- **ICT / Enterprise Architecture** – WaterNSW has made substantial progress toward integration of legacy systems, with a unified Enterprise Resource Management (ERP) solution going live in April 2019, providing a common platform for WaterNSW personnel to undertake core business functions.

- **Blue Mountains asset upgrades** – This project will result in renewal of critical end of life infrastructure at a number of WaterNSW facilities in the Blue Mountains. This includes both electrical and mechanical renewals, renewals at several pumping stations, and the complete replacement of the Greaves Creek Pumping Station. This project will result in substantial improvement to the reliability of the Blue Mountains bulk water supply system. The project is underway at the time of submission and will be delivered prior to the end of June 2020.

5.2.3 Actual capital expenditure compared to the 2016-20 IPART allowance

We have prepared a comparison of the IPART capital expenditure allowances from the 2016-20 Determination and our actual capital expenditure for the four-year period starting in 2016-17, and:

- explain the variance between allowed and actual capital expenditure
- highlight any significant deferment of projects, cost savings or cost increases experienced over the current determination period.

Capital expenditure variance

The total capital expenditure allowance set by IPART for the 2016-20 regulatory period was $254 million ($2019-20).[28] Current estimates show that actual / forecast expenditure will be $326 million (28%) higher than the IPART allowance. The $326 million in actual expenditure includes $57 million for projects to improve the ability of the Greater Sydney system to continue to provide water under varying operating conditions and storage levels. For example, drought resilience projects that were not anticipated at the time of the 2016-20 Determination process are a primary reason for the expected capital expenditures being higher than previously forecast.

If the drought resilience expenditure is excluded from our forecasts we can compare to the 2016-20 Determination on a like-for-like basis. Excluding the unforeseen drought resilience projects, actual capital expenditure for the 2016 regulatory period would have been $269 million which is $15 million (6%) higher than IPART's 2016 capital expenditure allowance.

The annual and total capital expenditure figures are shown in Table 5.2 below.

Table 5.2 – Comparison of actual and IPART allowance ($millions, $2019-20)

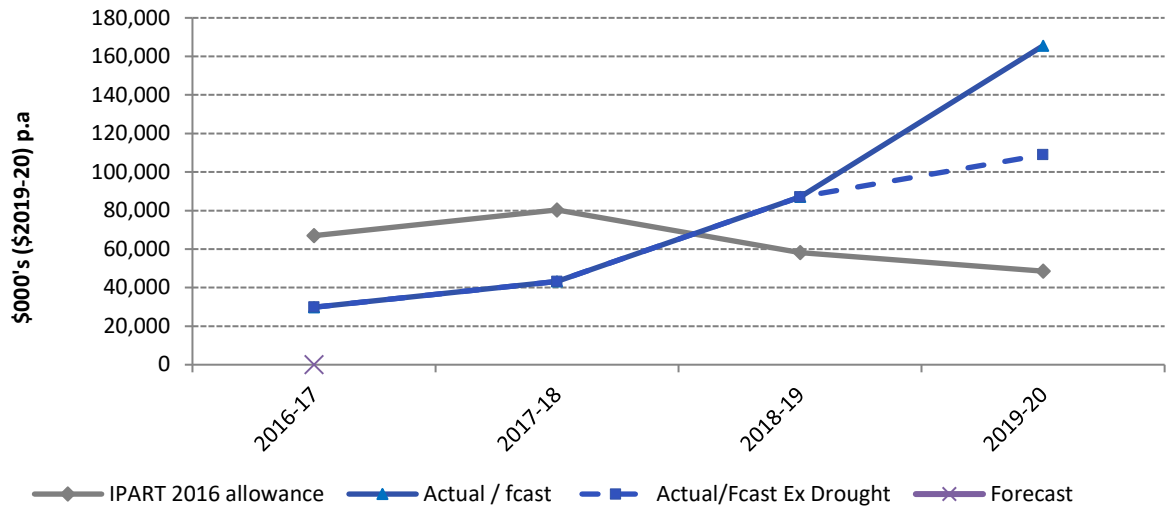
	2016-17	2017-18	2018-19	2019-20	Total
IPART 2016 allowance	67	80	58	49	**254**
Actual / forecast	30	43	87	166	**326**
Variance $	-37	-37	29	117	**72**
Variance %	**-55%**	**-46%**	**50%**	**241%**	**28%**
Drought Resilience $	0	0	0	57	**57**
Actual/Forecast Ex Drought	30	43	87	109	**269**
Variance Excl Drought $	-37	-37	29	60	**15**
Variance Excl Drought %	**-55%**	**-46%**	**50%**	**124%**	**6%**

Source: WaterNSW analysis

As shown in the Table 5.2 above and the Figure 5.3 below, our actual / forecast capital expenditure was significantly below IPART's capital expenditure allowances in the first two years of the regulatory period before increasing over the allowance in the final two years.

[28] All costs are stated in $2019-20 to allow comparisons between determinations.

Figure 5.3 – Comparison of actual capital expenditure and IPART allowance ($000's, $2019-20)

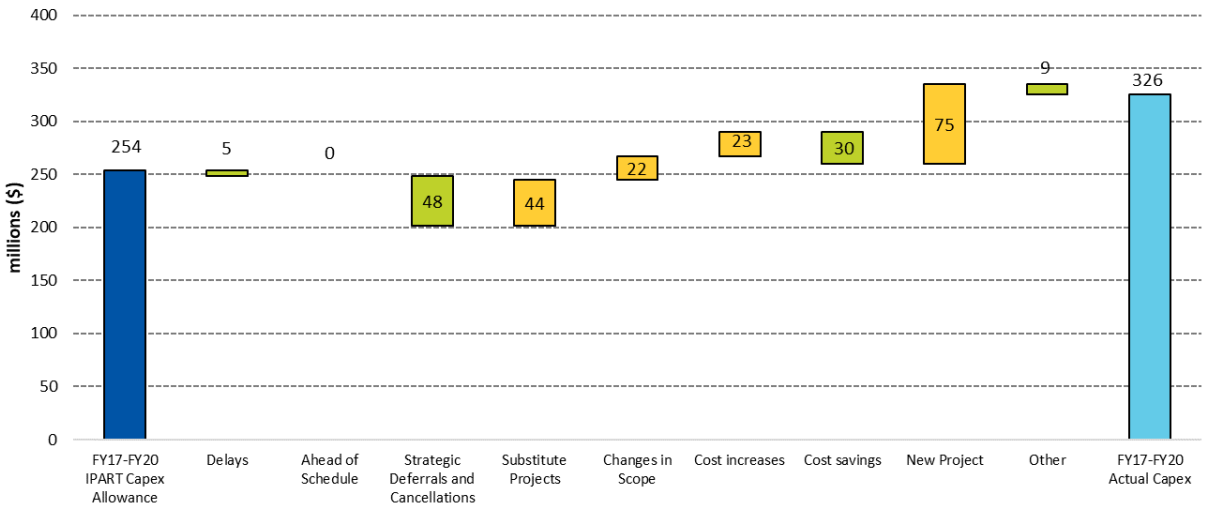


Source: WaterNSW analysis

5.2.4 Drivers for variances

At the time of the pricing review process for the 2016-20 Determination, WaterNSW was not a 'steady state' business. The structural reforms and legacy business issues affected our ability to invest according to the profile set out in IPART's capital expenditure allowance. The variances between allowed and actual / forecast capital expenditure over the current determination period is illustrated in Figure 5.4 and discussed below.

Figure 5.4 – Key reasons for variance between IPART allowance and actual capital expenditure ($millions, $2019-20)



Source: WaterNSW analysis

5.2.4.1 Delays

The current regulatory period includes ongoing activities in support of the implementation of a combined structure after the merger of SWC and SCA. Following the merger there was further activity as elements that transferred from DOI were effectively integrated into WaterNSW.

WaterNSW has now implemented a fit-for-purpose and effective organisational structure with respect to both asset management and capital project delivery. However, the implementation of the new organisational structure resulted in some disruption in the beginning of the regulatory period. This led to a slow start in delivery of the program, much of which has been made up following the establishment of the current planning and delivery structures, thus providing confidence that this can be repeated into the future.

Additionally, asset related expenditure was subject to review in line with the requirements of the WaterNSW Asset Management System. This resulted in the rationalisation of some projects in line with asset standards and corporate strategy. The completion of these reviews resulted in some delays at the start of the regulatory period, offset by substantial catch up toward the end of the period, resulting in a net decrease of $5.2 million over the period.

5.2.4.2 Strategic deferrals and cancellations

A number of projects were subject to review in line with both NSW Government policy and the new WaterNSW strategy. Following this review, the vast majority of the Warragamba Dam Reliability Upgrade was deferred (given the Dam Raising project for Flood mitigation), as well as significant elements of the Metropolitan Dams Electrical Upgrade. Strategic deferral and cancellations lowered actual capital expenditure by $47.6 million.

5.2.4.3 Substitute projects

The deferrals / cancellations were offset by works advanced due to changes to Government policy, risk or need. Substitute projects included the Warragamba E-Flows project, the replacement of the Stoney Gate at Pheasants Nest Weir and a project to undertake renewal works at the Nepean Deep Water Pumping Station as well as several ICT projects advanced based upon the Enterprise Architecture which was developed after the 2016-20 Determination.

In total, these projects increased capital expenditure by $43.9 million.

5.2.4.4 Changes in scope

In some instances, detailed project planning of some legacy projects resulted in the identification of additional scope required for achievement of project objectives. Projects falling under this category include the Warragamba Pipeline Embankment, Blue Mountains Electrical and Tallowa Fish Lift Upgrade projects. Changes in project scope resulted in a further $22 million added to the capital expenditure requirements.

5.2.4.5 Cost increases

Several projects were subject to cost increases arising either from expenditure ‘carryover’ from prior periods or from market costs being identified during the planning phase of the respective projects. Projects falling into this category are the Burrawang Pumping Station Electrical System Upgrade, Warragamba Pipeline Valves Replacement, and the Shoalhaven Roads Upgrade. A further $23 million was required for cost increases that occurred during the current regulatory period.

5.2.4.6 Cost savings

To balance, some of the cost increase, we were able to deliver $30 million in cost savings. Some projects have had cost savings delivered through careful management of scope and or efficient procurement. This includes the Upper Canal Interim Works Stage 2 project.

5.2.4.7 New projects

Currently, around 99% of NSW has been declared to be in drought. In line with WaterNSW's commitment to remain responsive to the changing needs of customers, a number of projects have been advanced within the current period due to ongoing drought conditions in NSW. These include preliminary planning activities on a number of drought related initiatives.

The majority of new projects includes investing an additional $57 million in drought resilience measures not foreseen in IPART's 2016-20 Determination.

5.2.5 Capital expenditure outputs

IPART has set output measures for WaterNSW as a starting point for measuring the prudence and efficiency of capital expenditure in its price reviews. In the sections that follow, we examine our performance against the output measures from the 2016-20 Determination.

IPART established 10 output measures for the 2016-20 Determination. WaterNSW monitors and reports annually to IPART on progress against these output measures. Progress against the capital expenditure output measures is presented in Table 5.3 below.

Table 5.3 – Activity against output measures to the end of 2018-19

Project	Capital expenditure ($2019-20)	Output measure	Expected completion	Activity to end 2018-19
Tallowa Dam Preliminary Risk Assessment and Design (WEM009)	$2.6m approved $0 actual	Completion of the project meeting budget and outcomes	N/A	The Greater Sydney Dam Safety Portfolio Risk Assessment resulted in the proposed works being deferred pending further investigation. Other dam safety works have been prioritised in their place.
Upper Canal Interim Works Phase 2	$63m approved $43.1m actual / forecast	Completion of the project meeting budget and outcomes	May 2019	The current packages of works are complete, and WaterNSW is transitioning to a 'monitor and respond' phase which will include some minor further works on drainage.

Project	Capital expenditure ($2019-20)	Output measure	Expected completion	Activity to end 2018-19
Metropolitan Dams Electrical system (Stage 3) (WEM028)	$29.4m approved $21.2m actual / forecast	Completion of the project meeting budget and outcomes	December 2019	Following a strategic review of the scope of works in line with current organisational priorities in 2016, the scope was refined to provide a more targeted response to WaterNSW risks. The rationalised scope of works will be delivered by December 2019.
Warragamba Pipelines valves and controls upgrade	$10.5m approved: $15.6m actual / forecast:	20% of total planned valve upgrades completed per year	June 2023	Some delays have resulted from the main contractor on these works going into receivership. There are ongoing delays associated with constraints on shutdowns arising from ongoing drought conditions and shutdown constraints arising from Sydney Water treatment works upgrades.
Motor vehicle fleet – procurement	$9.6m approved: $2.6m actual / forecast:	Achieve a reduction in vehicle changeovers of at least 4 vehicles on average per year until 2020-21	Ongoing	On target. 24 disposals and 15 additions in FY17.
Hydrometric Renewals Program (WEM001)	$3.8m approved: $4.5m actual / forecast:	Detailed asset management plan in place for the program	31 December 2016	Completed.
Blue Mountains Electrical Monitoring and Control	$3.7m approved: $5.6m actual / forecast:	Project completion	31 December 2019	Works are underway with completion expected prior to the end of 2019.
Warragamba Embankment Upgrade	$7.5m approved: $6.4m actual / forecast:	Progress towards project completion	June 2020	Completion of works to address highest priority issues is underway, with completion expected prior to the end of June 2020.

Project	Capital expenditure ($2019-20)	Output measure	Expected completion	Activity to end 2018-19
Burrawang Pumping Station Elect System Stage 3	$3.3m approved: $16.3m actual / forecast:	Project completion	June 2019	The project has completed physical construction and is undergoing performance testing with final handover following completion of site works (due for final handover prior to the end of June 2019).
Future augmentation of Sydney's water supply	$21.0m approved: $19.1m actual / forecast:	Substantial progress required in identifying and planning the next augmentation for Sydney's water supply	Planning phase completed by the end of June 2021.	Planning phase activities for the identified next investment tranche are now underway on the preferred option (a Burrawang to Avon Tunnel), with construction phase to follow based upon the outcomes of the upcoming NSW Government Greater Sydney Water Strategy 2020.

Source: WaterNSW analysis. Values for capital expenditure are forecast to the end of 2019-20.

5.3 Key drivers for proposed capital expenditure

WaterNSW is a relatively young organisation having been created in 2015 with the objective of improving the availability of water resources that are essential for the people of NSW.

Improving the availability of water is a fundamental driver of the capital expenditure plan and forecasts. Water is Australia's most critical resource and our capital expenditure plan recognises the importance of water to our communities, economy and environment.

In Greater Sydney, the capital expenditure program is heavily influenced by the 2017 Metropolitan Water Plan and resultant Government policy positions with respect to population growth, water supply security and drought resilience. The impact of drought and other operating environment challenges is discussed in the following sections.

5.3.1 Operating challenges

Some of the major external challenges which will require a strategic asset management and investment approach across WaterNSW over the next 10 years include:

- **Drought** – As discussed on page 12 of this proposal, Greater Sydney's water supply is large and secure. Even though we own and operate a highly secure and adaptable network with the ability for internal transfers to tackle pressure points, an extreme drought across NSW is having an impact on Sydney's catchments placing pressure on our drought security.

- **Security of supply** – The Greater Sydney region water sources are under pressure due to reducing yield, increasing population demand and new water demands for environmental purposes. Rural areas have experienced severe water shortages since the last protracted

"Millennium" drought with many areas continuing to experience restrictions

- **Operational resilience** – Given the critical nature of the Greater Sydney water supply, due consideration has been given to the resilience of the bulk water supply system to provide water of acceptable quality and reliability under a variety of operating contexts

- **Flood mitigation** – Flood mitigation historically has been a major function of certain rural dams and is now being considered for Greater Sydney storages. The future impacts of climate change will make flood mitigation an even more relevant consideration

- **Technological advances** – various remote monitoring and control systems (such as SCADA) present WaterNSW with opportunities to expand standardisation of these systems across the State and improve operational efficiency and safety

- **Customer focussed consultation** – as a customer focussed organisation, WaterNSW is committed to developing its plans in consultation with our customers' needs

- **Aging infrastructure** – some WaterNSW operational assets date back to the mid-19th century. Many operating precincts, facilities and assets have significant heritage and cultural significance and are listed on the State's Heritage Register. Management of these operational assets to meet regulatory and customer service requirements must be done with consideration of the Heritage Act 1999 (NSW)

- **Compliance** with obligations under the Dam Safety Act 2015 (NSW). This involves alignment of WaterNSW Dam Safety expenditure with the requirements of new risk-based dam safety management standards

- **Compliance** with WaterNSW's regulatory obligations with respect to water quality and catchment protection

- **Enabling** WaterNSW personnel to deliver high quality outcomes to our customers whilst supporting continuous improvement through the provision of equipment and technology solutions.

5.4 Capital expenditure strategy, planning and management

5.4.1 Asset Management System

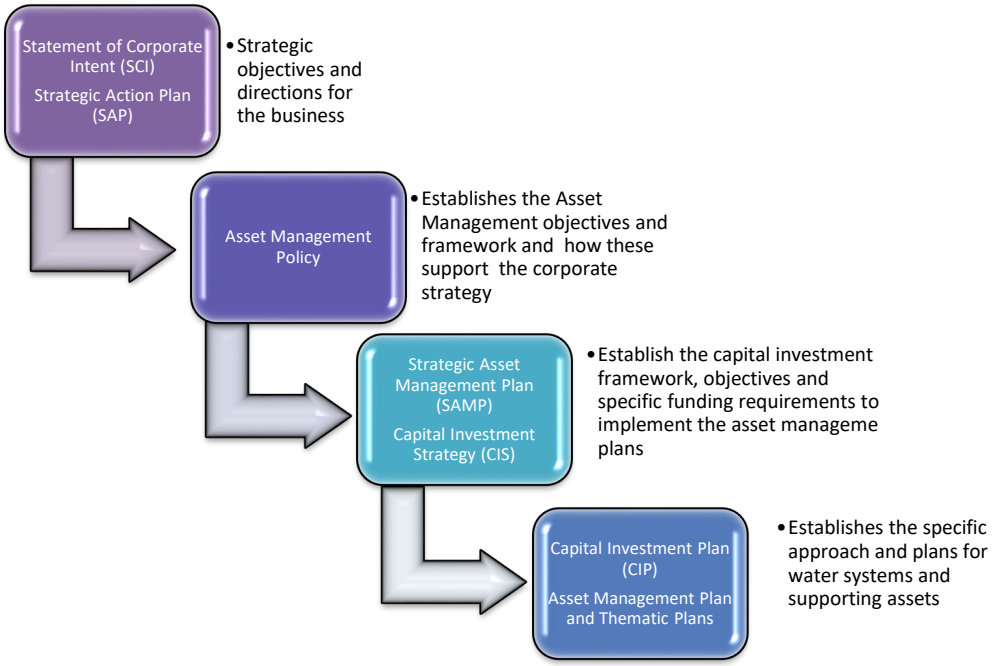
The WaterNSW Asset Management System (AMS) sets out how we manage assets to support the strategic objectives of the organisation. The AMS provides a structured and systemic life-cycle approach to optimise value from assets to achieve organisational objectives. The AMS applies to all physical assets owned, operated and controlled by WaterNSW in the conduct of its business.

WaterNSW is committed to developing and maintaining an AMS that supports responsible management of assets to deliver value to customers and support business objectives, in accordance with ISO55001 2014.

The AMS specifies how WaterNSW will deliver the appropriate level of service from its assets. This involves a combination of maintaining the capability of the asset base, augmenting the capability of the asset base and creating new capability within the asset base.

Figure 5.6 below summarises the key strategic asset investment relationships addressed in the asset management system.

Figure 5.6 – Key strategic asset investment relationships



Source: WaterNSW analysis

5.4.2 Strategic Action Plan

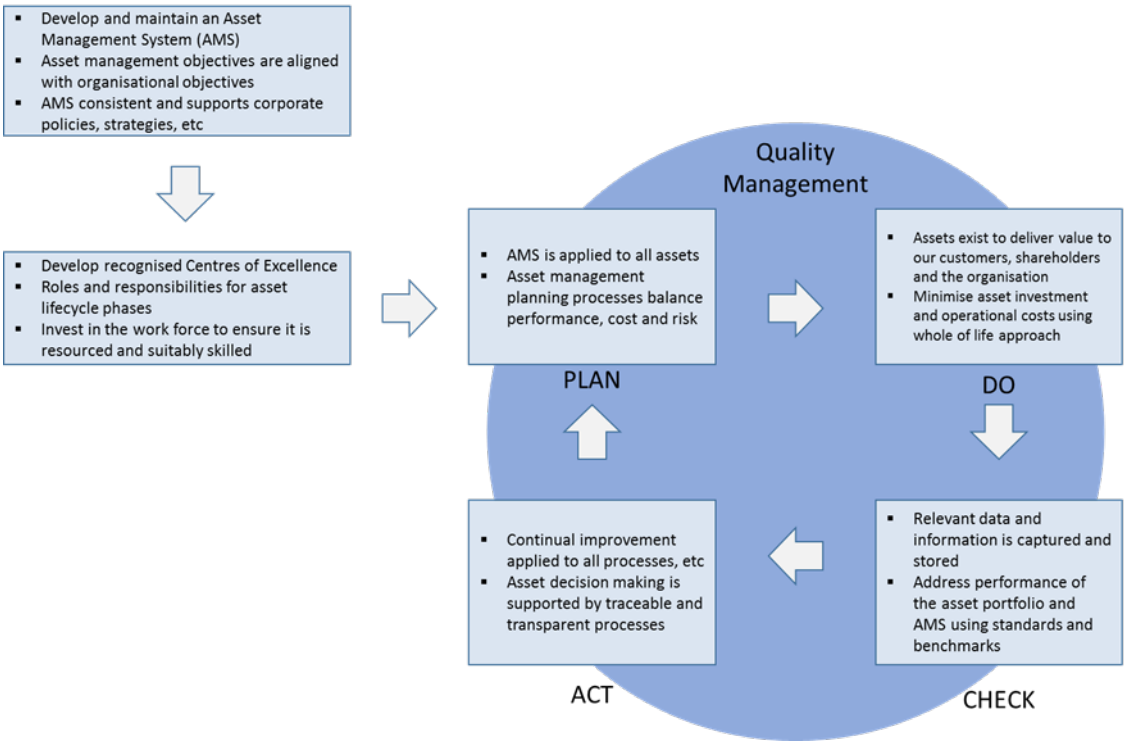
The WaterNSW Strategic Action Plan sets priorities for the business. It outlines how the organisation plans to continue to satisfy the need of WaterNSW customers and stakeholders.

5.4.3 WaterNSW - Asset Management Policy

WaterNSW is committed to providing effective asset management in order to achieve its legislated and strategic business objectives. The WaterNSW Asset Management Policy is directed at meeting our primary objectives and regulatory commitments as set out in the WaterNSW Act.

Our Asset Management Policy is illustrated in Figure 5.7 below.

Figure 5.7 – WaterNSW Asset Management Policy



Source: WaterNSW

Our Asset Management Policy states that meeting our primary objectives is supported by the effective management of large, long-lived water infrastructure assets and supporting assets such as buildings, information and communication technology, plant and equipment.

In order to achieve our legislated and strategic business objectives, WaterNSW will:

- operate from the principle that assets exist to deliver value for our customers, shareholders and the organisation
- develop recognised Centres of Excellence in the development, management and operation of the assets and infrastructure needed to collect, store, transfer and release bulk water
- develop and maintain an AMS that complements and supports our business in accordance with ISO55001 and which maximises the net worth of the State's investment in WaterNSW
- apply the AMS to all physical assets
- develop asset management planning processes that facilitate the balancing of performance, risk and cost across the asset portfolio, consistent with the objectives of the corporate risk management framework and potential current and future climate change impacts
- ensure relevant data and information is captured and stored in a common systematic and efficient manner, for the purposes of informed and timely decision-making
- ensure asset investment is supported by traceable and transparent decision-making processes, including associated relevant asset criticality, capability and condition information and data analysis
- optimise asset investment and operational costs using a whole-of-life approach and utilising suitable life-cycle models as appropriate

- address performance of the asset portfolio and AMS in consideration of relevant industry standards and benchmarks

- invest in the workforce to ensure it is resourced and suitably skilled for the productive and efficient delivery of asset management.

The Asset Management Policy has shaped the capital expenditure forecasts for this pricing proposal.

5.4.4 Strategic Asset Management Plan

The Strategic Asset Management Plan is the key document for describing the WaterNSW AMS and how various asset management activities are to be undertaken in support of achieving organisational objectives.

5.4.5 Capital Investment Strategy

The Capital Investment Strategy (CIS) provides a strategic view of WaterNSW approach to capital investment and supports the delivery of WaterNSW's Strategic Asset Management Plan. The CIS describes how we optimally manage capital investment in both new and existing assets and considers how customer, community and regulatory requirements will be met at least cost.

The CIS guides investment planning and decisions and aligns with the Strategic Asset Management Plan and WaterNSW corporate objectives. The CIS defines how the capital program is formulated and designed and identifies key factors that influence capital allocation and spending.

The CIS is used to develop the 20-year WaterNSW Capital Investment Plan and is a key component of the AMS.

5.4.6 Capital Investment Plan

The Capital Investment Plan describes the way we optimally manage investment to meet the needs of customers and comply with regulatory obligations.

The 10-year Capital Investment Plan is developed within the context of the AMS. The 10-year Capital Investment Plan covers water infrastructure, ICT, fleet, property and minor assets. At a minimum it is reviewed annually and used as the basis for capital expenditure forecasts for the Statement of Corporate Intent (SCI), budget and regulatory proposals. The 10-year Capital Investment Plan is presented in Attachment 2.

5.4.7 Key capital expenditure categories

WaterNSW classifies capital investment in four broad categories:

- Maintaining Capability

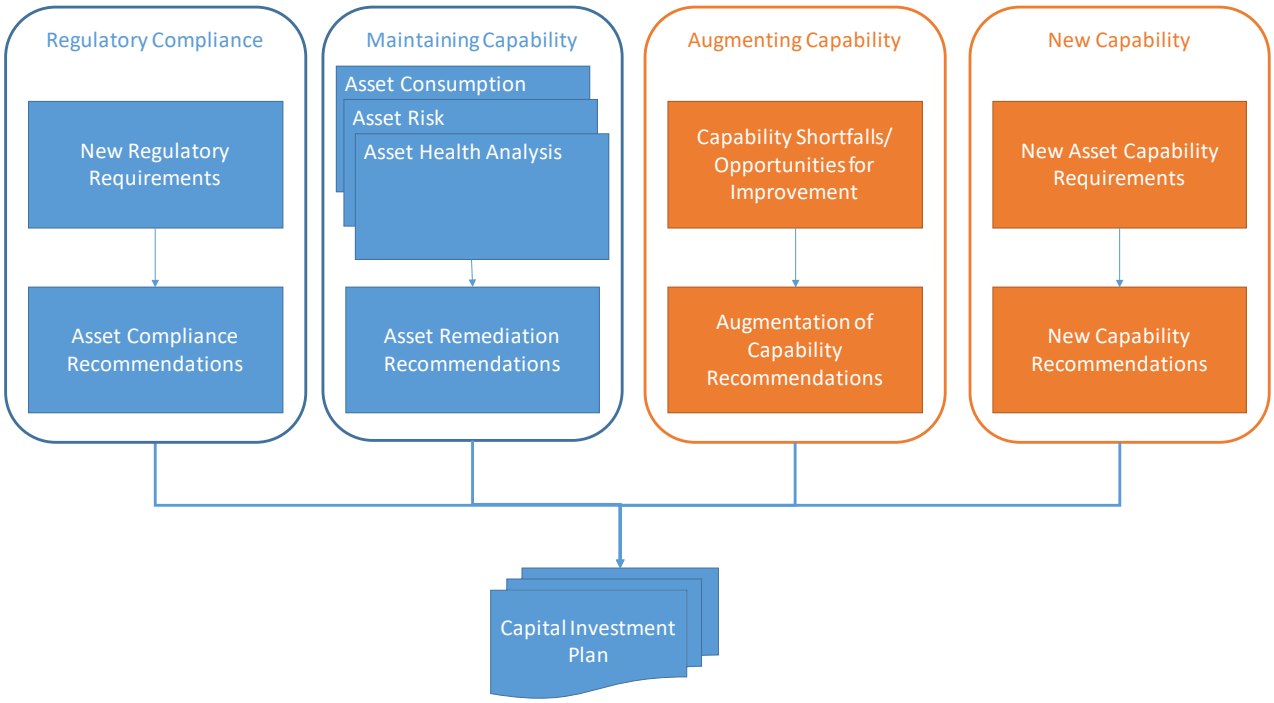
- Augmenting Capability

- New Capability/Solutions

- Regulatory Compliance.

Figure 5.8 below represents in simple terms how the broad capital investment categories flow through to the development of short, medium and long-term plans.

Figure 5.8 – Capital Investment categories and their relationship with the Capital Investment Plan



Source: WaterNSW

To achieve a successful capital investment strategy and appropriate customer levels of service, investment is mapped to the investment categories in the following ways:

Maintain Capability

- driven by assessment of assets against the WaterNSW Asset Health Standards including physical condition, functional reliability of equipment, technical and commercial obsolescence, serviceability and regulatory compliance
- asset health data assembled through various means is then analysed using the WaterNSW risk-based asset management processes to determine the optimal point at which intervention should occur

Augment Capability

- need for the organisation to respond to emerging or expanding customer requirements and emerging market conditions
- involves investment to augment the capability of assets in some way to deliver services. The scale of these augmentations can vary from the installation of automation on flow regulating structures up to increasing capacity to major storages (e.g. the recent Chaffey Dam augmentation). For the project to be considered augmentation there must be a material increase to an existing capability for delivering a service

New Capability – Solutions

- characterised by responding to needs or opportunities to deliver services or provide a capability of a nature which was not previously available
- investment in this program will predominantly be driven by WaterNSW's 20-Year Infrastructure Strategy. The 20-Year Infrastructure Strategy is a major feature of WaterNSW's 3-year corporate strategic action plan

Regulatory Compliance – Environmental, safety and dam safety

- comply with relevant environmental protection legislation
- comply with two sub-strategies of the 20-Year Infrastructure Strategy, namely:
    - State-wide 20-Year Fishway Implementation Strategy
    - Cold Water Pollution Implementation Strategy
- comply with Work Health and Safety requirements that apply to WaterNSW
- comply with the *Dams Safety Act 2015 (NSW)* which is intended to underpin a new dam safety regulatory framework. Dam Safety related risks are managed in accordance with the WaterNSW Dam Safety Management System as described in Section 5.5.

The investment strategy for this program is to determine a prudent, efficient and sustainable level of expenditure. The intent of this strategy is to ensure that the optimal level of funding is available, whilst providing the organisation the flexibility to substitute and reprioritise projects based upon need.

5.5 WaterNSW Dam Safety Management System

WaterNSW's AMS applies to the physical assets utilised by the organisation to deliver its services including infrastructure, water quality management, catchment protection and internal support. The Strategic Asset Management Plan provides alignment between the corporate objectives, the Asset Management Policy and the Asset Management Objectives.

Dams, as an asset type, require special treatment within the AMS due to the specific regulatory compliance requirements hence WaterNSW has developed a Dam Safety Management System (DSMS) to provide asset management standards for this asset type.

WaterNSW has implemented a DSMS as a tool to achieve the corporate objective of "Safety Excellence" by ensuring health and safety implications are considered in asset management activities and appropriate controls implemented to manage risks.

The DSMS provides WaterNSW with a framework for dam safety management activities, decision-making and supporting processes. WaterNSW applies the following Dam Safety Management objectives:

- all reasonably practicable measures are taken to prevent and mitigate dam failures and uncontrolled releases to protect people, property and the environment
- satisfy the legal and regulatory framework for dam safety by providing an overarching position for dam safety assurance

- effective leadership and arrangements for dam safety are established and sustained
- appropriate resources are allocated to allow effective implementation of the dam safety management program
- Dam Safety Management is optimised using a risk-based framework to provide the highest level of safety that can reasonably be achieved at least cost
- the organisation has in place appropriate emergency preparedness and response plans and measures in place for dam failures and incidents
- safety status and performance are evaluated through regular surveillance, safety reviews, risk assessments and monitoring regimes in compliance with guidelines produced by the Dam Safety Committee and Australian National Committee on Large Dams
- the dam safety management practices are regularly reviewed and audited to ensure they remain appropriate and in line with current good practice.

5.6 Capital expenditure forecasting methodology

WaterNSW forecast capital expenditure has been developed based upon the assessed requirement to meet current and projected levels of customer service levels at an acceptable level of reliability, whilst maintaining compliance with WaterNSW regulatory obligations.

5.6.1 Key assumptions

5.6.1.1 Organisational context

The capital forecast has been developed assuming no substantial changes to our operating licence and is aligned to the WaterNSW Strategic Action Plan.

5.6.1.2 Storage levels

Whilst current depletion rates across the Greater Sydney storages continue to be of concern, the capital expenditure forecast in this submission is based upon a 'business as usual' scenario. It was not considered appropriate to have substantial drought related expenditure reflected in customer bills given the high degree of uncertainty over whether these projects will ultimately be required and their potential cost. This matter is discussed in Section 4.5 'Addressing the uncertainty of major projects'.

5.6.2 Prioritisation and justification

WaterNSW prioritises capital works according to a number of criteria aligning with a general approach to the effective and efficient management of risks and benefits for customers and community.

The intent is to ensure that WaterNSW has the **right asset capability** to meet our obligations to customers, delivering service at the required level.

Guiding principles apply to the identification, prioritisation and scheduling of capital works, which are embedded in the respective processes:

- all investment is justified against 'do nothing' and alternative options. This means that capital investment projects are required to 'pay their way'
- investment analyses consider whether an asset is still needed. Retirement or disposal is always a possibility
- WaterNSW adopts a policy of "latest responsible intervention" whilst being sensitive to asset criticality, regulatory compliance requirements, and life-cycle costing considerations
- customer interests are always considered - '*should our customers be paying for this?*' is a core consideration of the capital planning process.

The above principles are embedded in the WaterNSW capital planning process, as well as the internal capital expenditure governance arrangements.

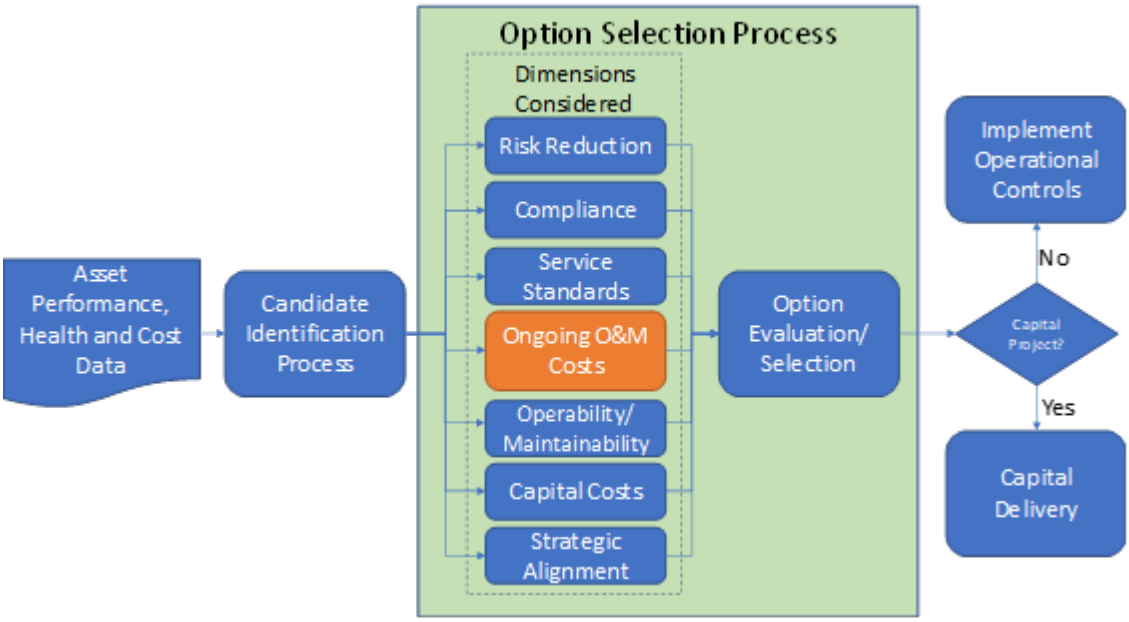
These processes aim to deliver an appropriate level of service to our customers for the least possible cost, whilst managing the risk to the organisation, customers and stakeholders to an acceptable level and maintaining regulatory compliance.

5.7 Trade-offs between capital expenditure and operating expenditure

In managing infrastructure assets, in general, there are trade-offs to be made between capital expenditure and operating expenditure to obtain optimal life-cycle outcomes. As a simple example, protective coatings for steel structures can be patch repaired throughout their lives (typically operating expenditure). However, as the coating deteriorates, the cost of repairs increases, whilst the efficacy of repair work declines. As such there is a point beyond which the deferral of full recoating of a major structure (typically capital expenditure) would result in an effective escalation of average life-cycle cost.

The optimisation of operational and maintenance costs is considered along with several other dimensions in the process of option evaluation and selection for capital works. Operating cost reduction may be considered as either the primary driver for undertaking capital works, or as a secondary driver influencing the selection of one amongst several options for a capital project. This is shown conceptually in Figure 5.9 below.

Figure 5.9 – Operational and Maintenance Operational expenditure as a dimension considered during option analysis and evaluation



Source: WaterNSW

5.8 Proposed capital expenditure forecasts

WaterNSW is proposing to invest $682.4 million ($2019-20) of capital over the 2020-24 Determination period. The capital expenditure program underlying this forecast will allow us to continue to improve the availability of water resources that are essential for the people of NSW while complying with our operating licence.

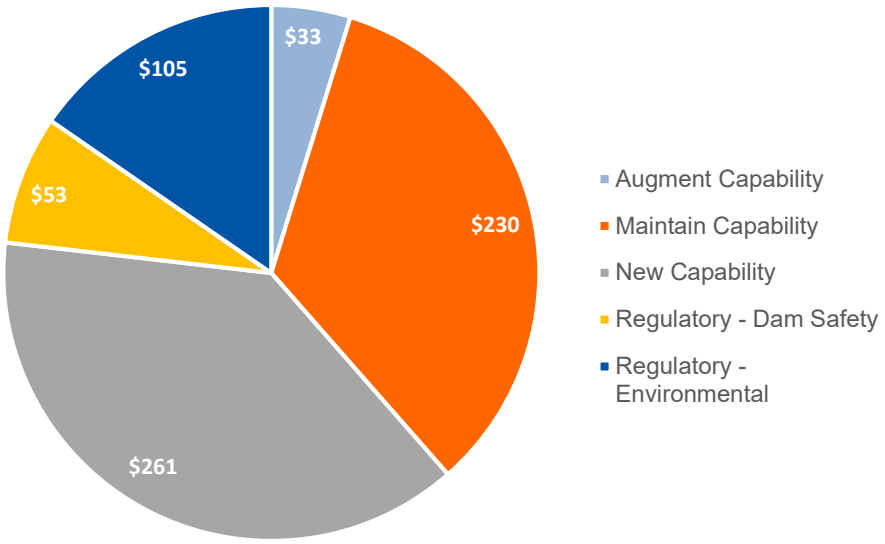
Our proposed capital expenditure forecast is 110% higher than the $326 million (including drought resilience projects) we expect to invest in the current regulatory period. The following figures outline our proposed capital expenditure for the 2020-24 Determination period based on key driver and program.

As described in Section 5.4, WaterNSW classifies capital expenditure into key capability drivers.

In line with WaterNSW organisational objectives we propose to invest $261 million, or (38%) of our total proposed capital program for 'new capability' expenditure to provide solutions for bulk water infrastructure needs in Greater Sydney. This includes expenditure for Avon Deep Water Access - $236 million. In addition, we propose to invest $230 million, or 34% of our total expenditure to maintain the capability of WaterNSW's existing assets to deliver the required level of service.

A total of $158 million is proposed to address regulatory compliance requirements, including $105 million for environmental compliance – which mostly consists of E-Flows construction at Warragamba Dam – and $53 million to address dam safety obligations.

Figure 5.10 – Proposed capital expenditure forecast by capability driver for 2020-2024 regulatory period ($millions, $2019-20)



Source: WaterNSW analysis

The proposed capital expenditure into key capability drivers is shown in Figure 5.10 above and Table 5.4 below.

Table 5.4 – Proposed capital expenditure forecast by key driver ($millions, $2019-20)

	2019-20	2020-21	2021-22	2022-23	2023-24	Total FY21-24
Augment Capability	8.3	12.2	7.9	7.3	5.3	32.6
Maintain Capability	74.6	65.0	55.4	53.2	56.8	230.4
New Capability	68.4	44.1	98.2	108.5	10.5	261.3
Regulatory - Dam Safety	4.9	12.8	15.2	17.5	7.7	53.2
Regulatory - Environmental	9.4	13.2	40.2	30.4	21.2	104.9
Total	**165.6**	**147.2**	**216.9**	**216.9**	**101.5**	**682.4**

Source: WaterNSW

5.8.1 Capital investment programs

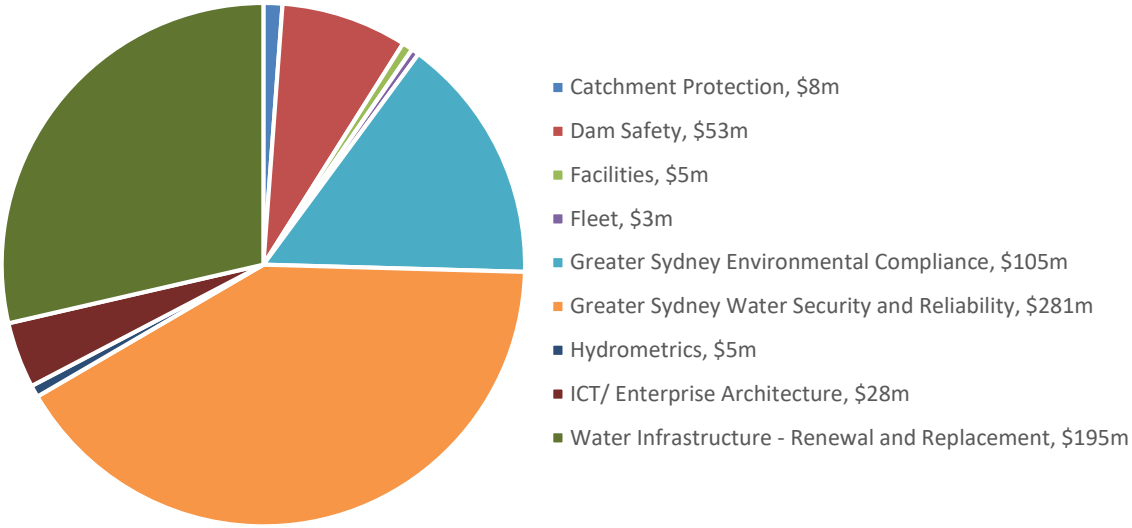
WaterNSW's 2020-24 capital investment plan for Greater Sydney has been developed to address a number of current service needs informed by the requirements of our customers, stakeholders and regulators. In response, the forecast expenditure for Greater Sydney in 2020-24 comprises of five key programs to address these service needs. Some of these programs are further broken down into sub-programs of work. This is summarised in Table 5.5 below.

Table 5.5 – Service need categories and programs

Program	Need Addressed	Sub programs
Water Infrastructure Renewals	Ensure that existing bulk water infrastructure in Greater Sydney continues to perform at an acceptable level of reliability and availability at least cost.	Water Infrastructure Renewals Hydrometrics Renewals
Water Supply Security and Reliability	Provide improved water supply security and reliability to accommodate changes in requirements including growth in demand, changing quality requirements, climate change, and requirements for increased resilience to varied operating conditions.	-
Water Quality, Catchment Protection and Environment	Support the protection of Greater Sydney drinking water catchments through prudent investment in infrastructure, plant and equipment, whilst maintaining compliance with environmental regulatory requirements.	Catchment Protection Environmental Compliance
Dam Safety Compliance	Comply with Dam Safety regulations through investment to reduce dam safety risk.	-
Business Capability and Enablement	Ensure that WaterNSW people have the right business systems, tools and support infrastructure to enable them to deliver quality results to customers, whilst enabling continuous improvement.	Facilities Fleet ICT/ Enterprise Architecture

The projected expenditure against these program categories is shown in Figure 5.11 below.

Figure 5.11 – Proposed capital expenditure forecast by program ($millions, $2019-20)



Source: WaterNSW

The capital programs by category are described below, including further discussion of the service need each program addresses, and how the program has been developed and prioritised. Further detail on the individual projects discussed can be found in Attachment 3 'Capital expenditure project and program justifications – Summary'. WaterNSW will be able to provide comprehensive documentation outlining project scope and justification upon request during the review.

5.8.2 Water Infrastructure – Renewals Program

WaterNSW operates an extensive system of assets in the Greater Sydney region for the provision of bulk water services comprising of dams, pipelines, weirs, canals, tunnels and pumping stations.

In order to provide the required service at a level of reliability that is acceptable to our customers, WaterNSW is required to undertake a range of maintenance and renewal activities. Prudent management of WaterNSW's assets involves undertaking appropriate regular maintenance tasks (operating expenditure) to ensure that assets are maintained in a way to optimise their useful lives. As assets age and deteriorate, capital interventions are required to either replace assets at the end of their effective useful lives, or to extend their useful lives through alternative capital renewal activities.

The timing of renewals is determined utilising WaterNSW corporate asset management modelling, which takes into consideration amongst other things, asset condition, performance, criticality, compliance and technical obsolescence. Through application of this approach WaterNSW is able to develop a renewals program for water infrastructure which appropriately prioritises critical assets, facilitates appropriate deferral of intervention of less critical assets, whilst considering lower cost non-replacement options for interventions.

5.8.2.1 Water infrastructure renewals

In applying a consistent approach to the determination of prudent water infrastructure investment, WaterNSW has identified a number of key priorities for the water infrastructure program for the 2020-24 Determination period.

WaterNSW forecasts a total of $195 million of capital expenditure on water infrastructure renewals for the 2020-24 Determination period. The Water Infrastructure Renewals Program will deliver improved condition, reliability and serviceability for critical WaterNSW infrastructure. It will also deliver substantial improvements to the safety of WaterNSW operational facilities for WaterNSW personnel.

Warragamba pipelines are some of WaterNSW's most important infrastructure and have been prioritised. This includes ongoing works to replace end-of-life isolation valves, restoration of cuttings and embankments, coating renewals, and drainage improvements. Other assets prioritised for renewal works include the Upper Canal, renewals of equipment and infrastructure at dam sites, and renewal of critical operational roads and bridges.

Table 5.6 below shows planned investment in water infrastructure renewals projects and programs for the 2020-24 Determination period.

Table 5.6 – Proposed water infrastructure– renewals capital expenditure by project ($2019-20)

Capital projects totalling $195.2 million
Warragamba Internal Lining Restoration Project
Renewals Provision
Warragamba Corridor & Pipeline – Tranche 1
Warragamba Pipeline ancillary valves upgrade
Upper Canal Maintenance Provision
Roads Upgrade Provision
Plant Scada Upgrade
Bridges Upgrade Provision
Bridges Upgrade
Warragamba Pipeline Corridor Restoration Planning
Nepean Weirs E-Flow Reliability Upgrade
Rock Fall Stabilisation Provision
Shoalhaven Roads Program
Working Plant and equipment – acquisition
Rock Fall Stabilisation Program
Prospect Security Upgrade

Source: WaterNSW

5.8.2.2 Hydrometric renewals

A distinct sub-program of works has also been developed to undertake ongoing renewals of hydrometric equipment across Greater Sydney. This program comprises of a large number of small value capital replacement of equipment based upon a combination of age and condition, to provide an appropriate level of reliability of the hydrometric network at least cost.

Table 5.7 – Proposed hydrometric renewals capital expenditure by project ($2019-20)

Capital projects totalling $5.0 million
Hydrometric renewals program

Source: WaterNSW

5.8.3 Water Supply Security and Reliability Program

As the principal supplier of bulk water for drinking water use across the Sydney Water operational area as well as several other council areas, WaterNSW is committed to ensuring that the bulk water supply system is capable of meeting current and future customer requirements. The WaterNSW strategic planning process has considered the following factors in building the Water Supply and Reliability Program.

5.8.3.1 System yield versus demand

Comparison of the current and future demand with total system yield to determine when new bulk water sources will be required and when.

5.8.3.2 Supply point requirements

WaterNSW supplies water to a number of delivery points across the Greater Sydney area. System planning must ensure that the system is capable of delivering the required water to meet daily demand under a variety of demand conditions at each delivery point.

5.8.3.3 Water quality requirements

Changes to bulk water infrastructure may be required to accommodate new water quality requirements for bulk water provided for treatment for drinking water use.

5.8.3.4 System operational resilience

Planning includes careful analysis of the ability of the system to provide water of suitable quality and quantity to different supply points under a variety of operating conditions.

5.8.3.5 System drought resilience

Analysis of whether WaterNSW can provide continuous, reliable supply to each supply node under severe drought conditions.

The Water Supply Security and Reliability Program for the 2020-24 Determination period includes a combination of asset enhancements and new asset solutions to address new and emerging needs. The program has been developed to address a combination of current customer needs, as well as to ensure that infrastructure is in place to satisfy new and emerging needs on a timely basis. WaterNSW has determined that an additional supply measure should be implemented at the Illawarra supply node. The largest project in this program, the Avon Deep Water Access project provides access to additional supply in 'dead storage', which will improve system yield as well as increase the reliability of supply and drought resilience to the Illawarra supply node.

The program will also increase the operational resilience of the bulk water supply system to the delivery points at Orchard Hills and Macarthur. WaterNSW will complete planning activity on the Burrawang to Avon Tunnel, the next major yield augmentation currently planned for Sydney, as well as complete preliminary planning for several other initiatives to increase the resilience of the Greater Sydney bulk water supply system to a variety of operating conditions and storage levels.

Table 5.8 below shows planned investment in water supply security and reliability projects and programs for the 2020-24 Determination period.

Table 5.8 – Proposed water supply security and reliability capital expenditure by project ($2019-20)

Capital projects totalling $280.8 million
Avon Deep Water Access
Other Greater Sydney Resilience Measures
Warragamba to Orchard Hill Transfer
Nepean Tunnel Diversion Culvert
Burrawang to Avon Tunnel
Avon Deep Water Access

Source: WaterNSW

5.8.4 Water Quality, Catchment Protection and Environment Program

This program has been developed to ensure that the quality of bulk water intended to be supplied for treatment for drinking water is protected through measures to monitor and manage water quality and protect WaterNSW's catchments. Also, this program includes activities to comply with WaterNSW's obligations under relevant environmental regulation.

5.8.4.1 Water quality and catchment protection

This sub-program will continue to implement sustainable renewal of assets required the protection of WaterNSW special catchment areas, including fencing, fire trails and plant and equipment. Table 5.9 below lists the capital works within this sub-program.

Table 5.9 – Proposed catchment protection capital expenditure by project ($2019-20)

Capital projects totalling $8.0 million
Fencing – Declared Catchments
Catchment Infrastructure Asset Renewals
Catchment Upgrade & replacement of Plant and Equipment
Fire Trail Upgrade
Upgrade Neutral or Beneficial Effect software

Source: WaterNSW

5.8.4.2 Environment

In the 2020-24 Determination period, the program will substantially deliver infrastructure that will allow for increased environmental releases from Warragamba Dam in line with the 2017 Metropolitan Water Plan for Sydney which identified this as the next major improvement in Hawkesbury-Nepean waterway health. This will comprise the majority of Water Quality, Catchment Protection and Environment program within the period.

The program will also substantially reduce risks from contaminated lands and hazardous materials on WaterNSW facilities. The two environmental compliance capital projects are shown in Table 5.10 below.

Table 5.10 – Proposed environmental compliance capital expenditure by project ($2019-20)

Capital projects totalling $104.7 million
Warragamba Environmental Flows (E-Flows).
Contamination and Hazardous Material Management

Source: WaterNSW

5.8.5 Dam Safety Compliance Program

WaterNSW has developed the Dam Safety Compliance program through application of the Dam Safety Management System (DSMS) in line with the requirements of WaterNSW's Asset Management System. As indicated in Section 5.5, the DSMS has been developed and implemented to ensure:

- all reasonably practicable measures are taken to prevent and mitigate dam failures and uncontrolled releases to protect people, property and the environment

- WaterNSW satisfies the legal and regulatory framework for dam safety by providing an overarching position for dam safety assurance
- effective leadership and arrangements for dam safety are established and sustained
- appropriate resources are allocated to allow effective implementation of the dam safety management program
- dam safety management is optimised using a risk-based framework to provide the highest level of safety that can reasonably be achieved at least cost
- emergency preparedness and response for dam failures and incidents is provided
- safety status and performance are evaluated through regular surveillance, safety reviews, risk assessments and monitoring regimes in compliance with the Dam Safety Committee and Australian National Committee on Large Dams guidelines.

Within the context of the DSMS, the Greater Sydney Portfolio Risk Assessment (PRA) identified an intolerable dam safety risk profile for several WaterNSW dams. This level of risk does not meet the regulatory requirements for dam safety as determined by the Dams Safety Committee. Consequently, upgrades are required on the Fitzroy Falls Reservoir, Cataract Dam and Cordeaux Dam to bring these storages into the 'As Low as Reasonably Practicable' zone for the Dam Safety Committee's chart of societal risk for existing dams. These dam safety upgrades are summarised below in Table 5.11.

Table 5.11 – Dam safety upgrades

Dam	Issue	Works
Fitzroy Falls	Major risk contributors are piping through upper part of embankment and earthquake-induced cracking and piping through upper part of embankment	Design and construct Internal Erosion Interception Trench
Cataract Dam	Major risk contributors are flood - sliding failure of dam through foundation, flood - failure of spillway gravity section, flood - overtop left embankment and breach and earthquake - dam slides through foundation	Installation of foundation relief drains and access ramp (following geo-technological investigations, seismic hazard assessment and stability assessment)
Cordeaux Dam	Current analysis with residual strength parameters indicates very low Shear Friction Factors for the Dam and the Spillway in the event of a Probable Maximum Flood	Foundation Relief Drain Expansion and Upgrade (following geo-technological investigations, seismic hazard assessment and stability assessment)

Source: WaterNSW analysis

The Dam Safety Compliance Program will also deliver improvements to dam safety monitoring, instrumentation and telemetry, increasing WaterNSW's ability to effectively manage dam safety risks in a timely manner.

Table 5.12 – Proposed dam safety compliance capital expenditure by project ($2019-20)

Capital projects totalling $53.2 million
Greater Sydney Post-PRA Dam Safety Upgrade Program
Dam Instrumentation Automation Telemetry
Uplift Drain Restoration and Renewals
Greater Sydney Security Upgrade
Post Tensioned monitoring of GS PT dams
Hydraulic Piezometer Assess & Maintain all applicable sites (16)
Geospatial equipment and Software
WaterNSW Seismic Monitoring Network
Risk based Surveillance - new instrument (all sites reviewed)
Wingecarribee 5-year inspection
Tallowa 5-year inspection
Greaves Creek 5-year inspection
Lake Medlow 5-year inspection
Warragamba 5-year inspection
Prospect 5-year inspection
Glenquarry Cut 5-year inspection
Fitzroy Falls 5-year inspection
Upper Cordeaux 5-year inspection
Woronora 5-year inspection
Avon 5-year inspection
Nepean 5-year inspection
Cataract 5-year inspection
Broughton Pass 5-year inspection
Cascade No 1 (Middle) 5-year inspection
Woodford Creek 5-year inspection
Cascade No 2 (Lower) 5-year inspection
Cascade No 3 (Upper) 5-year inspection
Bendeela Pondage 5-year inspection

Source: WaterNSW

5.8.6 Business Capability and Enablement

5.8.6.1 Proposed ICT projects and programs

WaterNSW's ICT systems support every aspect of our role in providing bulk water services to our customers. The merger of SCA and SWC to form WaterNSW (and transfer to WaterNSW of some DOI functions) created an ICT environment that needed to be transformed to allow us to better serve our customers.

Substantial progress was made by WaterNSW in the current regulatory period towards increasing the efficiency and effectiveness three legacy systems from SCA, SWC and DOI. The improvements included ICT systems used by employees, including the consolidation to a single login environment, updated website content, integration of water market systems and implementation of a unified Enterprise Resource Management system. This progress will continue into the 2020-24 Determination period.

Our ICT vision is to partner to achieve business outcomes through the delivery of customer value; innovative and agile solutions and reliable services. We propose to invest $27.8 million in the 2020-24 Determination period to continue transforming our ICT environment to match the needs

of our customers. The transformation of our ICT systems is expected to drive reductions in our ICT operating expenditures over time as discussed in Section 6.6.8.1 'Information technology'.

The proposed ICT forecast for the 2020-24 Determination period is necessary to continue transforming legacy ICT systems into a modern and fit-for-purpose architecture and improve our operating performance.

5.8.6.2 Performance in the current period

In the current period our actual capital expenditure in ICT is expected to be $35.7 million ($2019-20). This amount is $12.6 million (55%) higher than IPART's 2016 allowance of $23 million ($2019-20).

During the 2016-20 Determination review process, WaterNSW initially proposed to invest approximately $24 million ($nominal) on ICT capital expenditure noting that no consideration had been made, at that time, to ICT requirements as a result of the SCA-SWC merger.[29]

Following the release of IPART's Draft Report for the 2016-20 Determination, we submitted a proposal to invest a further $15 million ($nominal) on ICT. IPART did not accept this additional amount as part of the 2016-20 Determination on the basis that it had been submitted late in the review process and IPART and external stakeholders were not able to assess the prudence and efficiency of the proposed additional ICT capital expenditure.

IPART largely accepted our original proposed ICT capital expenditure forecast (apart from a small reduction for the ICT renewal project).

5.8.6.3 Context for our current investment in ICT

In 2015, WaterNSW inherited a mix of ICT legacy systems that were found to be outmoded, overly complex and costly to support. As noted at the time of the 2016-20 Determination process, WaterNSW was not a steady state business due to the NSW Government reforms and merger of water agencies.[30]

At the time, there was significant duplication and inefficiencies in ICT systems, resulting in ineffective or limited business process automation capability. This complexity and diverse technology platform created a risk to the business for ongoing support of the environment including higher operating costs and poor business outcomes.

The newly formed WaterNSW established a new corporate direction and Strategic Action Plan requiring review of the ICT environment. The new Strategic Action Plan required an 'enterprise' view of the ICT environment to enable us to achieve the plan.

The ICT Road Map set out WaterNSW's future state ICT capability requirements over four years. We submitted our ICT program to IPART as part of the 2017 Rural Valleys Pricing Review. Costs for the ICT program are allocated to Greater Sydney in accordance with WaterNSW Cost Allocation Manual provided as Attachment 4.

The current 'ICT Road Map' comprises five themes/programs:

[29] Aither, Final Report, WaterNSW Greater Sydney expenditure review, February 2016, p.72
[30] Aither, Final Report, WaterNSW Greater Sydney expenditure review, February 2016, p.vi

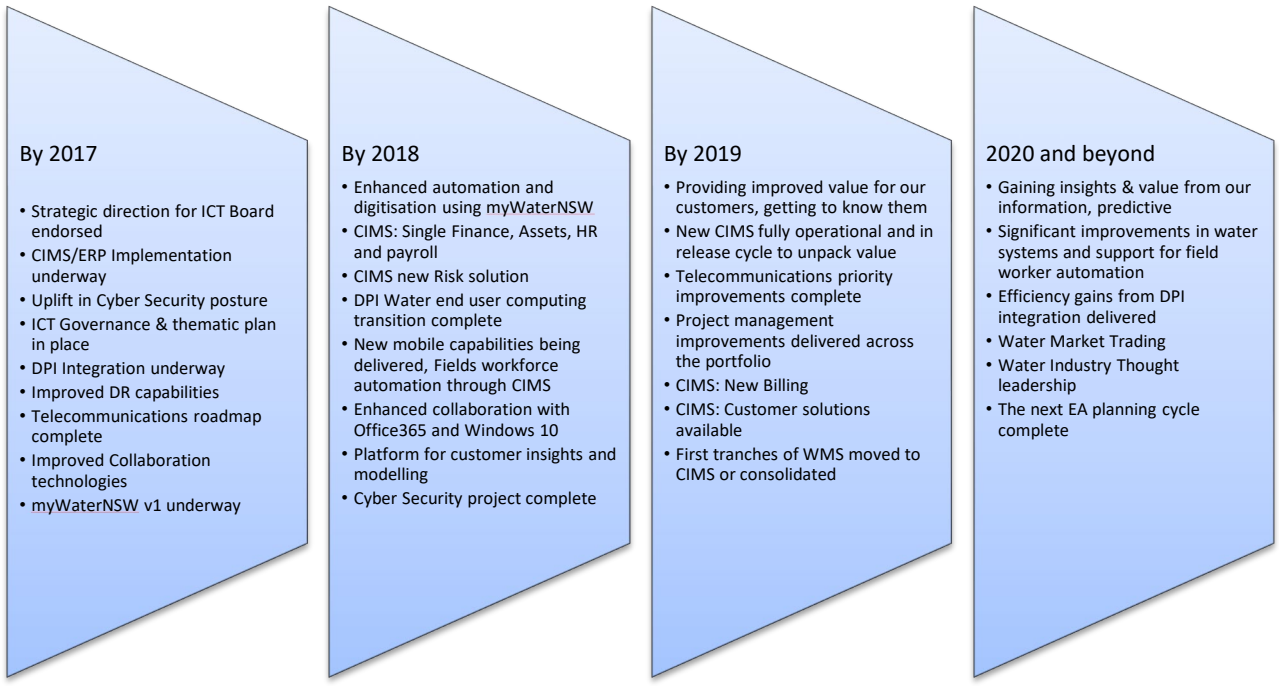
Table 5.13 – ICT Road Map themes and programs

Program	Aim
Customer Value Program	To provide clarity on our customer and retail aspirations and deliver the enabling technology to support new and improved services.
Insightful Information Program	To develop the necessary capabilities to make the best use of our information and knowledge, gaining insights into improvement opportunities and our customer's needs.
Improved Productivity Program	To reduce inefficiencies and duplication, giving our people the right systems and technologies to support their work.
Proactive Planning and Governance Program	To develop the guiding frameworks and knowledge to better understand, plan for and deliver on the business aspirations of Water NSW.
Healthy Assets Program	To optimally manage the ICT assets of WaterNSW to reduce business risk and cost, and to ensure they support the business needs now and into the future.

Source: WaterNSW

The corporate ICT Road Map and our progress in delivering the ICT projects is shown in Figure 5.13 below.

Figure 5.13 – ICT Road Map (corporate perspective)



Source: WaterNSW

The Road Map is currently being implemented and is expected to be finalised in the current regulatory period. Many of the investments are company-wide, therefore limiting them to Greater Sydney does not reflect the activities and costs incorporated in the ICT strategy.

Achievements in ICT

Implementation of the ICT Road Map will deliver transformation objectives contained in the WaterNSW Strategic Action Plan.

The Road Map has guided ICT investment in the current regulatory period. Substantial progress has been made towards harmonising ICT systems in the current period. The types of programs implemented to date include systems to consolidate to a single employee login environment, updated website content, integration of water market systems and implementation of a unified Enterprise Resource Management system.

In April 2019, the final stage of the Consolidated Information Management System (CIMS) project was delivered and is one of our key projects to deliver modern business systems capability across our core organisational functions. CIMS will change and improve the ways we work and will provide a modern whole of business systems platform. CIMS supports everyone at WaterNSW to "Achieve Together" by sharing information and developing our strategic forecasting and decision-making skills and capability.

5.8.6.4 ICT Strategic Plan for the 2020-24 period

Our ICT forecasts for the 2020-24 Determination period are based on the 2019-2024 ICT Strategic Plan. The 2019-2024 ICT strategic plan identifies focus and priorities to support the successful delivery of the WaterNSW's vision and goals.

The 2019-24 ICT Strategic Plan continues the transformation in our ICT environment started under the 2016 ICT Strategic Plan. It has been developed to align with the WaterNSW corporate objectives and enable the delivery of WaterNSW strategic priorities.

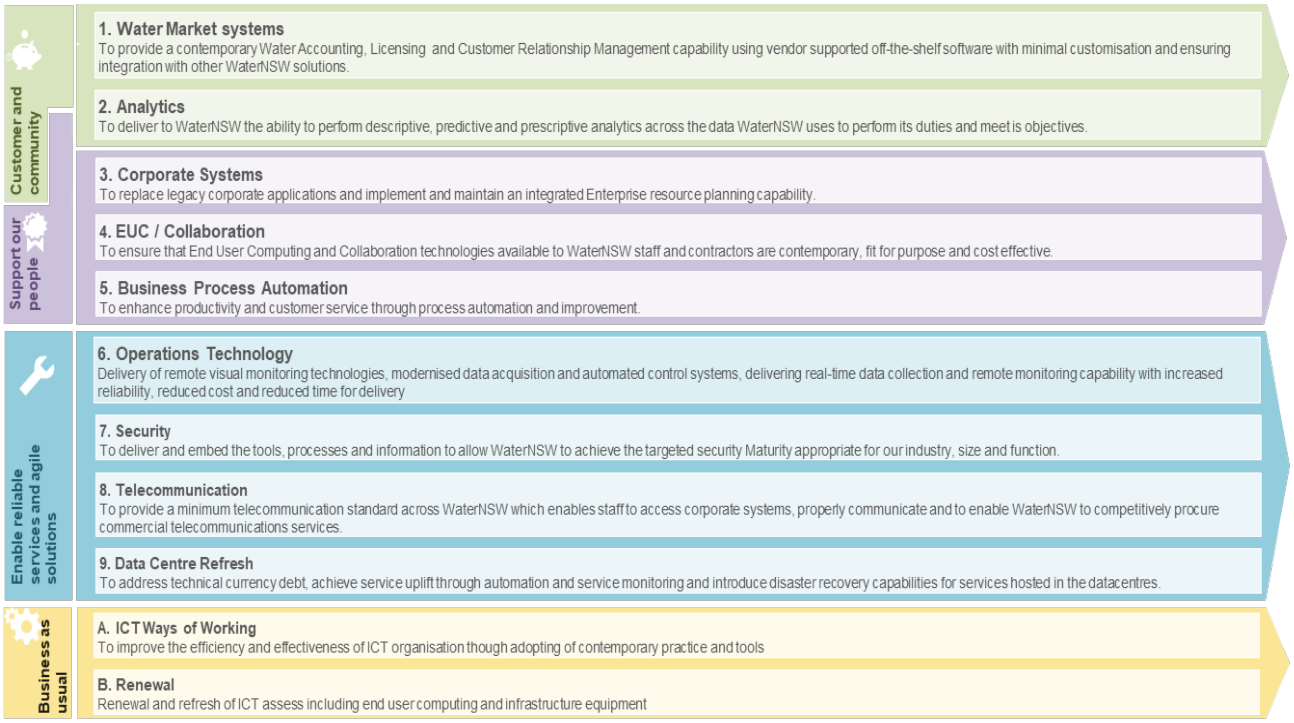
The new ICT plan embarks on a digital transformation to assimilate a range of technologies and help improve delivery of services to customers and improve the productivity of our operations. The 2019-24 ICT Strategic Plan identifies the ICT needs of the organisation and of our customers and sets out a plan to meet these over the near-term.

5.8.6.5 ICT forecast, projects and programs

Our proposal to invest $27.8 million on ICT in the 2020-24 Determination period will ensure that we continue transforming the ICT environment to meet the needs of our customers in an efficient and prudent way. Our forecast ICT capital investment is $12.6 million (55%) lower than our actual expenditure in the current period.

The ICT strategic plan includes nine programs that focus on customer, efficiency and technology foundation and two business-as-usual programs. These are set out in Figure 5.14 below. We note that while the ICT programs presented below span across WaterNSW's operations, only the costs associated with Greater Sydney activities are included in this proposal. Our ICT costs are allocated in accordance with our Cost Allocation Method provided as Attachment 4.

Figure 5.14 – Key corporate ICT programs for 2019-24



Source: WaterNSW 2019-24 ICT Strategic Plan

Our ICT forecast projects and programs have been developed to continue supporting our core services and at the same time consider market trends, changing technology and new and unprecedented risks (e.g., cybersecurity risks).

Table 5.14 below shows planned investment in ICT projects and programs for the 2020-24 Determination period allocated to Greater Sydney.

Table 5.14 – Proposed ICT capital expenditure by project ($2019-20)

Capital projects totalling $27.8 million
Analytics
Renewals and Replacement
Operational Technology - Greater Sydney
Water Market Systems
Corporate Systems
EUC & Collaboration
Data Centre
Operational Technology
Telecommunication Greater Sydney
Cyber Security
Business Process Automation Program
Telecommunications
CIMS

Source: WaterNSW

We describe the top three key projects from Table 5.14 by dollar value in the following sections.

Analytics

Our aim is to transform water resource management and planning through data and insight. The goal is to move away from siloed functions with limited data access and large manual processing requirements to a centralised data repository which supports the enterprise and customer needs for data and functions.

This in turn supports WaterNSW's ambition to support improving the consistency and quality of our operational and description reporting and support the uplift into predictive and prescriptive analytics.

WaterNSW has developed an analytic framework based upon this aim and have an in-flight Analytics programs scoped to deliver the foundational requirements to uplift capability and deliver several key business outcomes.

Renewals and replacement program

The purpose of the Information Technology Assets Renewal Program is to ensure that the majority of standard-use, WaterNSW-owned computers are fully capable of running current applications and any future upgrades or new applications anticipated during the projected planning cycle (currently three years for computers and five years for networked printers, two years on mobile devices), and to ensure that these systems can continue to be adequately supported.

Operational technology

The Operational Technology program will deliver rationalised and modernised SCADA & Telemetry systems. This closely aligns to, and is an enabler for, the ICT Analytics program that will provide the organisation with a single-source location for storing, accessing and leveraging asset, metering, hydrometrics, dam surveillance and other data.

The Operational Technology program also includes leveraging *Internet of Things* and remote visual monitoring technologies for increased operational efficiency and cost reduction for asset monitoring and optimisation.

The four drivers for the remote visual monitoring solution are as follows:

- improve staff and contractor safety
- improve public safety
- generate operational efficiencies
- strengthen the protection of critical assets.

5.8.6.6 Property / Facilities

WaterNSW recognises the priority of providing personnel with office and workshop facilities which are suitably located and properly equipped to enable performance. As such investment is planned in order to consolidate multiple WaterNSW offices and depots in South-West Sydney to one location. Table 5.15 below shows the proposed capital expenditure for property and facilities over the 2020-24 Determination period.

Table 5.15 – Proposed property capital expenditure by project ($2019-20)

Capital projects totalling $4.5 million
Facilities - South West Corridor (Nepean Depot)

Source: WaterNSW

5.8.6.7 Fleet

WaterNSW operations are dispersed across NSW in various offices and facilities. WaterNSW requires vehicles to transport personnel and equipment to different facilities to perform their work. There is a continuing program of fleet renewals in which vehicle replacement is scheduled in a way to minimise life-cycle costs whilst maintaining vehicles of a suitable standard for the work required. Proposed capital expenditure on fleet for the 2020-24 Determination period is presented in Table 5.16 below.

Table 5.16 – Proposed fleet capital expenditure by project ($2019-20)

Capital projects totalling $3.3 million
Motor Vehicle Fleet procurement

Source: WaterNSW

5.8.7 Capital expenditure by theme and activity

The following tables present capital expenditure according to formats requested by IPART in the AIR and SIR accounts. They are provided here for information.

The five-year capital expenditure forecast for key themes and activities is shown in Table 5.17 below.

Table 5.17 – Proposed capital expenditure forecast by theme / program ($millions, $2019-20)

	2019-20	2020-21	2021-22	2022-23	2023-24	Total FY21-24
Catchment Protection	1.8	1.8	2.2	2.5	1.5	**8**
Dam Safety	5.3	12.8	15.2	17.5	7.7	**53.2**
Facilities	5.2	4.5	0	0	0	**4.5**
Fishway Construction	3.2	0	0	0	0	**0**
Fleet	2.6	1.5	0.6	0.6	0.6	**3.3**
Water Supply Security and Reliability	0.0	0	0	0	0	**0**
Environmental Compliance	5.3	13.2	40.1	30.1	21.2	**104.7**
Water Security and Reliability	70.1	48.5	103.9	114	14.4	**280.8**
Hydrometrics	1.2	1.2	1.3	1.3	1.3	**5**
ICT/ Enterprise Architecture	9.8	9.5	6.4	6	5.8	**27.8**
Recreational Facilities	3.6	0	0	0	0	**0**
Regional Water Security and Reliability	0.0	0	0	0	0	**0**
Renewal and Replacement	57.4	54.2	47.2	44.8	49	**195.2**
Total	**165.6**	**147.2**	**216.9**	**216.9**	**101.5**	**682.4**

Source: WaterNSW

5.8.8 Capital expenditure by activity

The key components of the capital expenditure forecast are shown in tables below.

Table 5.18 – Proposed capital expenditure forecast by activity ($millions, $2019-20)

	2019-20	2020-21	2021-22	2022-23	2023-24	Total FY21-24
Existing mandatory standards	84.4	79.8	69.3	63.6	64.1	**276.8**
New mandatory standards	7.5	11.7	10.3	15.6	6.6	**44.2**
Growth	21.0	20.9	98.2	108.5	10.5	**238.1**
Government programs	52.7	34.8	39.1	29.2	20.3	**123.3**
Total	**165.6**	**147.2**	**216.9**	**216.9**	**101.5**	**682.4**

Source: WaterNSW

Table 5.19 – Proposed capital expenditure forecast by purpose ($millions, $2019-20)

	2019-20	2020-21	2021-22	2022-23	2023-24	Total FY21-24
Dams	7.6	17.1	48.0	43.6	25.8	**134.5**
Other Storages	15.0	2.0	0.0	0.0	0.0	**2.0**
Meters	1.2	1.2	1.3	1.3	1.3	**5.0**
IT systems	10.6	12.3	8.7	7.8	8.8	**37.6**
Vehicles	2.6	1.5	0.6	0.6	0.6	**3.3**
Buildings	9.4	6.9	2.3	1.5	1.5	**12.2**
Office equipment	0.1	0.0	0.0	0.0	0.0	**0.0**
Plant & machinery	2.1	1.4	1.1	1.7	0.6	**4.8**
Pipelines	31.1	27.8	103.9	114.0	14.4	**260.1**
Major Mechanical	11.5	7.6	7.5	2.5	0.0	**17.6**
Systems/ Controls	2.1	4.4	2.5	1.6	1.7	**10.1**
Roads/ Minor Civil	31.4	46.0	40.9	42.1	46.3	**175.3**
5 yearly Inspections	0.4	0.3	0.2	0.3	0.4	**1.2**
Major Electrical	6.2	0.0	0.0	0.0	0.0	**0.0**
Major facilities	34.3	18.7	0.0	0.0	0.0	**18.7**
Total	**165.6**	**147.2**	**216.9**	**216.9**	**101.5**	**682.4**

Source: WaterNSW

The capital expenditure forecast excludes potential major projects such and drought resilience capital expenditure programs. We are proposing the address these potential projects through regulatory pass through mechanisms discussed in Chapter 4.

5.8.9 Top 10 capital expenditure projects and programs by dollar value

A large proportion of our capital expenditure program can be attributed to a number of key projects.

Our proposed Top 10 projects and programs for the 2020-24 Determination period represent approximately $595 million ($2019-20), or 87% of our total proposed capital expenditure. The Top 10 projects and programs by dollar amount are shown in Table 5.20 below.

Table 5.20 – Top 10 projects and programs by dollar value ($millions, $2019-20)

Capital projects totalling $594.6 million
Avon Deep Water Access
Warragamba Pipeline and Corridor Renewals
Warragamba Environmental Flows (E-Flows)
Water Infrastructure Renewals
Dam Safety - Post-PRA Risk Reduction Works
Water Security and Reliability Measures (Resilience Measures)
Warragamba to Orchard Hills Transfer
Upper Canal and Corridor Refurbishment
Bridges Renewals
Roads Renewals

Source: WaterNSW

A summary of these projects and programs is provided in Attachment 3 'Capital expenditure projects and program justifications – summary'. WaterNSW can provide IPART with full justification documentation for these and other projects through the review process upon request.

5.9 Delivering the proposed capital expenditure plan

5.9.1 Structure for success

As outlined in Section 5.2.1, WaterNSW has implemented business improvements that will ensure timely and efficient delivery of the capital program. WaterNSW has invested in the development of an improved approach to capital project delivery including establishing a specialist 'major projects' business unit, solely focussed on delivery of very large projects, each with dedicated project delivery teams. Additionally, the 'Asset Delivery' business unit has been restructured in a way that allows for more efficient leveraging of market capabilities for project delivery and support as required. WaterNSW has increasingly consolidated core competencies associated with the development of efficient project development, which are then delivered through external delivery resources, including external design services and construction.

As the portfolio has grown in terms of project number, scale and complexity, it is becoming necessary to develop additional capability to ensure effective management of that portfolio. This additional capability includes a more robust approach to project controls to ensure a consistency in delivery and management and will initially be managed through a contracted service.

5.9.2 Track record of delivery

5.9.2.1 Wentworth to Broken Hill Pipeline

The successful delivery of the Wentworth to Broken Hill Pipeline has demonstrated WaterNSW's capability to deliver large, critical infrastructure projects on time and within budget.

This $384 million project consisted of the construction of a 270 kilometre pipeline from the Murray River at Wentworth to Broken Hill to provide an alternative water source for the town. The pipeline was 'ready for water' in December 2018 in line with the target date. Delivery of the Wentworth to Broken Hill Pipeline involved the creation of a dedicated project delivery team including dedicated project management, project engineering, environmental management, and community management resources. Project delivery also involved the development of a heavily tailored procurement approach.

5.9.2.2 WaterNSW combined capability

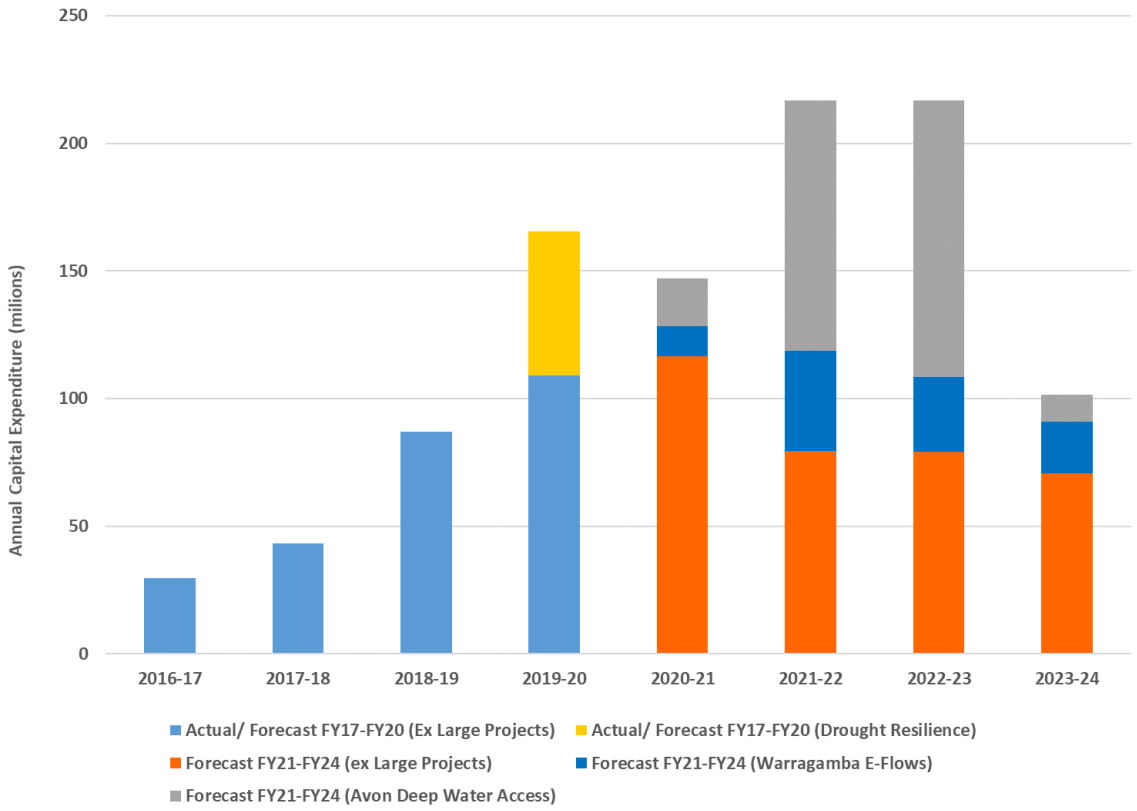
WaterNSW has demonstrated that as a combined entity, it can deliver significantly more capital expenditure than its predecessor organisations. Across WaterNSW we delivered $298 million of capital expenditure in 2017-18 and are forecast to deliver $304 million in 2018-19, and $256 million in 2019-20. These results compare very favourably with what was able to be achieved by either predecessor organisation and demonstrate a clear improvement in the capability of WaterNSW to deliver substantial capital programs of work.

5.9.2.3 Delivery of large projects in the 2020-24 Determination period

WaterNSW is well positioned to leverage off key learnings from the Wentworth to Broken Hill Project in the timely and efficient delivery of the $236 million Avon Deep Water Access Pipeline, as well as the $100 million Warragamba E-Flows construction project. Delivery of these projects will leverage off carefully customised procurement strategies. Dedicated teams have been established to oversee the planning (and subsequent delivery) of these projects. A core of WaterNSW personnel will be supported by contracted resources as needed to ensure time, cost and quality parameters are met for the procurement and ongoing contractor management of the delivery contractor/partner.

The forecast for capital expenditure is presented below, with the Avon Deep Water Access Pipeline and the Warragamba E-Flows presented separately. This in turn is compared with actual/forecast capital expenditure within the current regulatory period, with current water supply security and reliability work presented separately. As illustrated in Figure 5.15 (which excludes the Broken Hill Pipeline), once these large individual projects are removed, the annual rate of expenditure sits comfortably within the trend of annual capital expenditure spend observed over 2018-19 and 2019-20.

Figure 5.15 – Comparison of actual capital expenditure in 2016 regulatory period and forecast capital expenditure for 2020-24 Determination period - large projects shown separately ($2019-20)



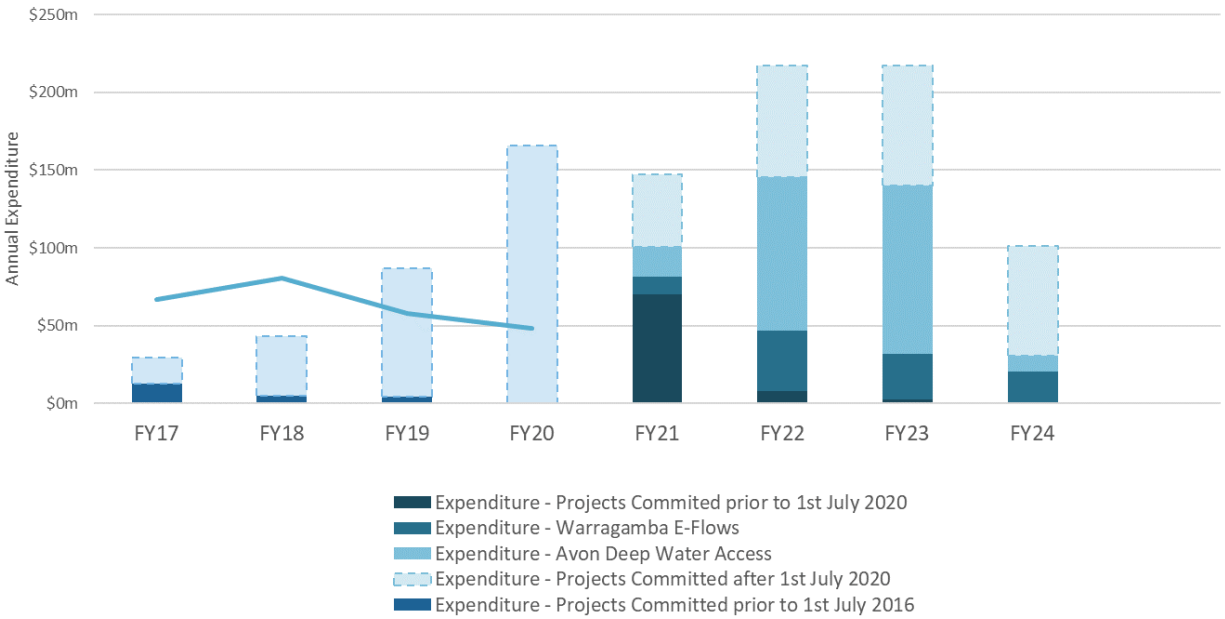
Source: WaterNSW analysis

5.9.3 Improved project commitment status as at start of period

One area of demonstrated improvement relative to the current regulatory period is the projected starting position in terms of project commitments at the start of the 2020-24 Determination period. As at the start of the 2016-20 regulatory period WaterNSW had entered into contractual commitments accounting for $22m of expenditure over the period, or 9% of the capital allowance for the period.

WaterNSW expects to enter the 2020-24 Determination period with commitments accounting for $417 million of forecast spend over the regulatory period. This would account for 61% of forecast expenditure being committed by the start of the regulatory period. Figure 5.16 shows annual expenditure by commitment status as at the beginning of respective regulatory periods.

Figure 5.16 – Comparison of Projected Commitment Status as at 1st of July 2020 with Historic Status as at 1st of July 2017



Source: WaterNSW analysis

5.9.3.1 Current state

During the 2016 regulatory period, WaterNSW approach for delivery of the Water Infrastructure Renewals Program and core capital projects has been to:

- conduct project feasibility services, program and project management and business case development services internally for projects and programs, supported by external expertise
- procure project design and delivery for the majority of water infrastructure renewals through the establishment of supplier agreements:
    - a panel of delivery contractors
    - a range of designers engaged under master service agreements for both concept and detailed design services
- undertake tailored procurement strategies for large projects based on market conditions and project risks.

This approach has enabled WaterNSW to deliver capital projects and programs as planned; however, WaterNSW has experienced the following issues with its approach:

- services for each project are separately tendered and contracted between panel members. This results in a high degree of administration resources and renegotiation of contract terms
- competitive three quote tendering of contracts exceeding $250,000 which results in a high degree of procurement, project management and administration resources
- the pipeline and scale of projects has not been steady enough to fully leverage the benefit of a panel arrangement by ensuring a steady flow of work in some cases.

Throughout the current regulatory pricing period, WaterNSW has gone through a transformation from three separate entities into a single organisation. During this period, WaterNSW procurement processes have matured through significant development and implementation.

This includes a restructuring of the project delivery team to separate the technical aspects of project delivery from the broader project management function. Additionally, the procurement function has taken a more commercial focus moving away from what was largely an administrative focus.

5.9.3.2 Future state

WaterNSW is currently planning its operating model and strategy for the 2020-24 Determination period. A step change in capital spending between the previous and forthcoming regulatory periods (from $254 million to $682 million) will require WaterNSW to further develop and continuously improve on its procurement activities in terms of both 'value for money' and project deliverability.

In order to deliver the increase in capability to deliver a larger capital program, WaterNSW is seeking to improve procurement capability, processes and maturity and leverage the capabilities of the private sector market. WaterNSW is seeking to establish an efficient procurement framework for each tranche of the capital works portfolio.

To address the challenges outlined above, WaterNSW's future procurement strategy will be predicated on the following 'high level' principles:

- sharing of WaterNSW cost and schedule risk with the supply chain where it is advantageous to do so
- earlier contractor support in business case development and input into concept designs
- use of contractor expertise in efficient program management and project delivery (scheduling, logistics and efficient deployment of resources)
- leverage contractor buying power of local products and services
- a program-based procurement approach for renewals to leverage value through scale and effectively scheduling of delivery
- development of a contractual framework that contains pre-agreed contract terms with the supply chain
- appropriate levels of competition for different disciplines and locations
- transparency of capital works pipeline with the supply chain to enable contractors, designers and consultants to obtain and plan resources
- a program life-cycle that provides for performance monitoring of contractors.
- a more mature project control function to assist in more efficient monitoring and management of project delivery.

WaterNSW is considering a delivery partner approach and the development of separate procurement strategies for each major project.

5.9.3.2.1 Major projects / programs

Of our $682 million proposed capital program ($2019-20), $361 million, or 53%, will be invested in major programs and projects. Specific procurement strategies for major programs and projects would consider the requirements, objectives and risks of the program and project in the development of its procurement strategy.

Successful delivery of the Broken Hill pipeline has demonstrated the effectiveness of a tailored procurement process from a cost efficiency, schedule management and risk management perspective.

5.9.3.2.2 Water Infrastructure Renewals

Based on the estimated pipeline of projects within each region, an approach for the Water Infrastructure Renewals Program under early consideration is, to engage:

- either a single delivery partner(s) by geographical region
- a panel of concept designer(s)
- a panel of specialist contractors to provide specialist technical services such as SCADA and coatings
- panels of consultants for ad-hoc services such as business case development support.

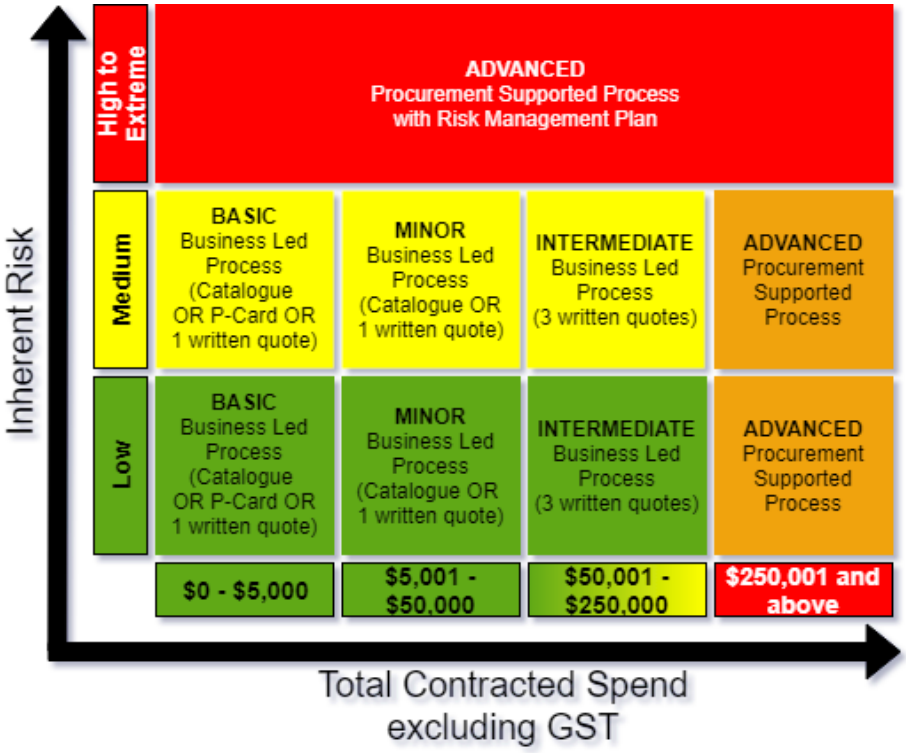
It is envisaged that delivery partners will have the capability to self-perform at least some of the works within their geographical region and have the program and project management capability to supplement self-performance.

This approach will enable WaterNSW to realise its procurement strategy principles (outlined above) by sharing program and project risks with the delivery partner and leveraging the benefits of delivery partner expertise throughout the program and project life-cycle.

5.10 Procurement activities

WaterNSW has implemented policies and procedures so that best value can be obtained from procurement activities. Our approach is described below in the WNSW Risk / Spend matrix.

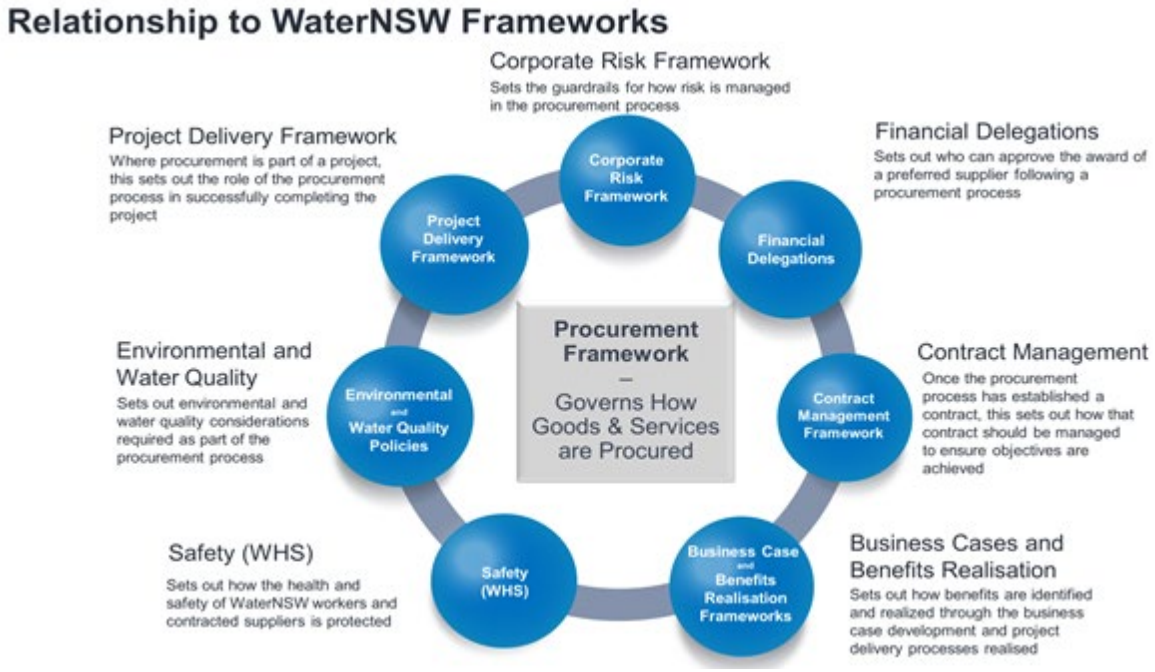
Figure 5.17 – WaterNSW Risk / Spend matrix for procurement activities



Source: WaterNSW analysis

The Procurement Framework governs how goods and services are procured at WaterNSW. As such, several other WaterNSW frameworks interface with the Procurement Framework to ensure procurement is conducted with good governance and best practice as illustrated in Figure 5.18.

Figure 5.18 – Procurement Framework relationship to other WaterNSW Frameworks



Improvements in our procurement activities contribute to our confidence that proposed investment programs are being delivered in an efficient way and offering good value for the benefit of our customers.

6 Operating expenditure

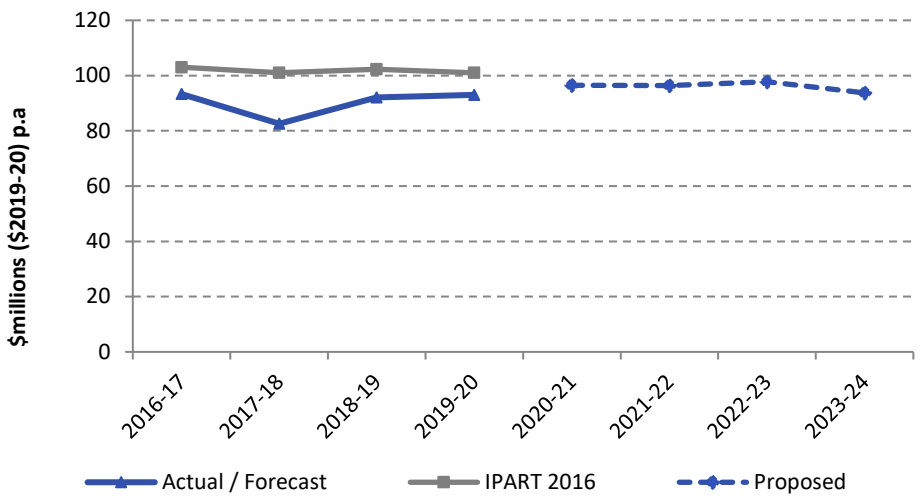
We propose operating expenditures of $384 million ($2019-20) for the four years of the 2020-24 Determination period. We are able to keep prices low through a continuous focus on driving efficiencies and the inclusion of a 'top down' efficiency dividend.

6.1 Summary of operating expenditure proposal

For the 2020-24 Determination period, we propose operating expenditures of $384 million, which represents a $23 million, or 6%, decrease from IPART's allowances in the 2016-20 Determination. Our proposed operating expenditures exclude the potential cost of Shoalhaven Scheme transfers which are recovered from Sydney Water through a separate cost pass-through mechanism.

Our proposed operating expenditure compared to historical expenditure and IPART's allowance from the 2016-20 Determination is provided in Figure 6.1.

Figure 6.1 – Operating expenditure allowance and actual operating expenditure 2016-17 to 2019-20, proposed operating expenditure 2020-21 to 2023-24 ($millions, $2019-20)



Source: WaterNSW analysis

In order to consolidate our productivity gains and maintain our momentum for growth in productivity going forward, we have adopted a 'top down' approach to our forecasting by including productivity targets across our controllable expenditure.

We are focussed on improving productivity over the regulatory period. While challenging, we propose an annual efficiency target of 1% of our base costs each year from 2020-21. This target equates to a reduction of approximately $1.0 million per annum in our proposed operating expenditures over the determination period.

WaterNSW's operational expenditure plan for the 2020-24 Determination period will enable us to deliver regulated services more efficiently and support the expected growth across the region. Operating expenditure funds activities required to operate, assess and maintain our assets in accordance with regulatory compliance obligations. Our operating costs also include support functions to assist business operations.

6.2 Introduction

The water industry is facing considerable uncertainty relating to, amongst other things, the continued effect of drought. Despite ongoing changes to our operating environment, WaterNSW is pleased to report cost savings relative to IPART's operating expenditure allowances from the 2016-20 Determination. These cost savings, while contributing to downward pressure on water prices, have not impacted on the level of service we have provided to our customers as we supplied water required by our customers within agreed quality specification.

Effective management of operating expenditure is crucial for WaterNSW to be able to deliver ongoing productivity improvements, whilst providing high quality services. Operating expenditure historically, and in this pricing proposal, comprises around 40% of our total revenue requirement.

Over the course of the current regulatory period WaterNSW has significantly transformed its operational structure.

We have been able to realise productivity gains resulting from the merger of SCA and SWC and have been able to achieve efficiencies that result in operating expenditure reductions compared to the allowances approved by IPART in the 2016-20 Determination period. WaterNSW is now entering the next phase of its transformation journey. With our core organisational structure bedded down, WaterNSW is proposing an expenditure plan which is more reflective of a steady state operating environment for WaterNSW.

We have built on our current efficient cost base to produce our operating expenditure proposal for the 2020-24 Determination period. We have recently implemented changes to our internal team structures to improve the efficiency and effectiveness of catchment management and protection and water monitoring. These changes aim to improve our response capabilities in managing water quality and quality risks for the Greater Sydney region.

We have also sought to optimise the mix between outsourcing and insourcing activities to leverage internal water expertise and to achieve lowest cost solutions for customers. These arrangements are expected to improve our management of regulatory requirements, business risks, service levels and the ability to leverage internal capabilities between our regulated business segments.

6.3 Role of operating expenditure in delivering customer value

WaterNSW employs operating expenditure in managing its assets for the delivery of both bulk water services and the operational management of the Greater Sydney Bulk Water resource. WaterNSW has three main streams of activities, with other functions supporting these activities. These activities are outlined below:

System operation and maintenance

- Bulk water supply - Supplying water from our storages to customers in the Greater Sydney drinking water catchment in line with operating requirements and Supply Agreements with Sydney Water and other bulk water customers

- Operating and maintaining our assets, driving operational improvements and complying with regulatory requirements, including dam safety

Catchment management activities

- Source water protection - Protection of the Greater Sydney drinking water catchment to ensure safe water is supplied to Sydney Water, local councils and other distributors for treatment and distribution to their customers. These costs are primarily a function of compliance with regulatory obligations and the responses to weather events (such as fire and flood).

Corporate functions

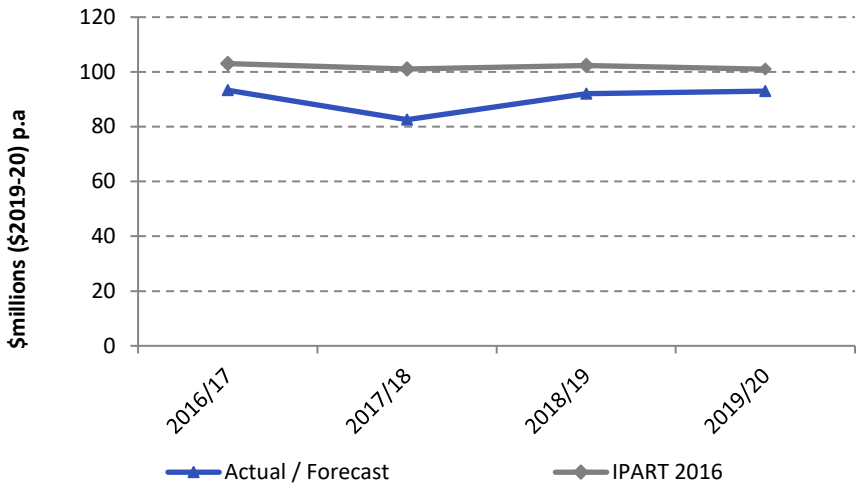
- Corporate function costs are added to the core operating expenditure streams on a project-by-project basis. Corporate functions include the indirect administrative costs associated with running WaterNSW to achieve its core functions for Greater Sydney, including expenses relating to Human Resources, Finance, ICT, Legal, Regulatory and Executive administration.
- Key cost drivers for our corporate function operating expenditure programs include the types of asset investment programs, the size of our asset base and our compliance obligations.
- Section 6.6.9 sets out our procedure of allocating corporate functions for the 2020-24 Determination period in greater detail.

6.4 Our performance in the current regulatory period

As illustrated in Figure 6.2 and Table 6.1 below, we are expecting to deliver actual / forecast operating expenditure of $361 million ($2019-20), or a saving of $47 million, or 11%, compared to IPART's operating expenditure allowance of $407 million ($2019-20) for the four years of the 2016-20 Determination.

Through effective management of our operating expenditures and through the reprioritisation of projects and programs over the regulatory period, we expect to deliver savings in each year of the 2016-20 Determination period.

Figure 6.2 – Actual / forecast operating expenditure compared with IPART's regulatory allowance ($millions, $2019-20)



Source: WaterNSW analysis

Table 6.1 – IPART approved operating expenditure ($2019-20)

	2016-17	2017-18	2018-19	2019-20	Total
IPART determination allowance	103.0	101.1	102.3	101.0	407.4
Actual / forecast	93.3	82.6	92.1	93.0	361.0
Variance ($)	**9.7**	**18.5**	**10.3**	**8.0**	**46.5**
Variance (%)	**9.4%**	**18.3%**	**10.0%**	**7.9%**	**11.4%**

Source: WaterNSW analysis

As illustrated in Table 6.1 above, our annual operating expenditure in the current regulatory period varies significantly year-on-year and tracks 11% below the allowances set by IPART in the 2016-20 Determination. While much of the underspend is attributed to efficiencies, WaterNSW notes that its actual expenditure does not reflect a steady state operating environment.

WaterNSW has exercised temporary restraint on activity following the 2015 merger of SCA and SWC in order to bed down and implement our internal organisational structure, business policies and procedures (e.g. our asset management policy) and investment governance arrangements.

Variances between allowed and actual expenditures include the following:

- a $1.2 million average reduction per annum due to lower bulk water purchase costs from the Fish River Water Scheme (FRWS)
- a functional realignment of the WaterNSW organisation structure was implemented to integrate the functions transferred to WaterNSW, resulting in a lower overall cost base (including support costs) for Greater Sydney customers
- greater focus in investment governance approval processes, placing greater scrutiny on organisational expenditure, with the focus being to invest in areas aligned to our strategy, improve customer outcomes and enable compliance with our legal and regulatory obligations
- greater emphasis on providing services that reflect the optimal mix of insourcing and outsourcing to address legislative requirements, business risks, service levels and the ability to leverage internal capabilities between our other regulated business segments
- procurement saving in water management, land management, telecommunications, ICT software and fleet
- review of our capitalisation policies to ensure continual alignment with accounting standards and consistency with the capitalisation rates applied by other capital-intensive regulated utility businesses
- a move to cloud-based software, which has resulted in licensing and subscription costs being treated as a fee for service operating expenditure, plus increases in cybersecurity costs
- An increase in water monitoring costs, increases in land management costs, land tax provision, increased maintenance activities, higher land contamination costs, increases in Shoalhaven pumping costs and increases in insurance contributions.

Variances for specific activities are discussed in the following sections.

6.4.1 Dam Safety

Our dam safety expenditures over the 2016-20 Determination period were driven by business as usual activities, including routine and yearly inspections, training, instrumentation and monitoring, and security services, with increases in expenditure occurring in 2016-17 and 2017-18 as result of the Greater Sydney Portfolio Risk Assessment (PRA).

6.4.2 Water monitoring

In the current 2016-20 Determination period, expenditure on water monitoring activities was driven by routine and non-routine monitoring costs for both field services and laboratory services. Non-routine costs vary depending on the number of sampling events which is contingent on weather conditions.

WaterNSW experienced an increase in non-routine monitoring cost in 2016-2017 due to higher sampling and wet weather events. Non-routine monitoring cost declined in 2017-18 due to lower occurrences of sampling events and dryer weather conditions.

6.4.3 Catchment management

Catchment management expenditure over the 2016-20 Determination period, particularly in 2018 was influenced by the temporary restraint of activity following the 2015 merger of SCA and SWC. Weather-related events also had an impact on cost levels including sampling and expenditure on pest and weed control. Table 6.2 below outline our actual operating expenditure over the 2016-20 Determination period compared with IPART's allowances.

Table 6.2 – Actual / forecast catchment management operating expenditure ($000's, $2019-20)

Service stream	2016-17	2017-18	2018-19	2019-20	Total
Source Water Protection	4,077	2,867	3,434	6,786	**17,164**
Land management	17,983	16,047	15,448	15,624	**65,102**
Water Quality Science	1,455	969	1,069	1,883	**5,375**
Enforcement and surveillance	267	447	363	863	**1,939**
Development Impact Assessment	4,260	3,040	2,662	2,541	**12,502**
Engaged communities	1,248	1,255	605	1,024	**4,131**
Total actual/forecast Catchment Management operating expenditure	**29,289**	**24,624**	**23,581**	**28,721**	**106,215**

Source: WaterNSW analysis

Annual variances in expected actual catchment management expenditures for the 2016-20 Determination period include the following:

Source water protection

- includes the grazing and erosion program, priority pollutant program, diary program and the cost of the catchment and remote area fire team and catchment audit costs
- annual costs can vary year-on-year contingent on weather events (e.g. fire and flood)
- delays in expenditure were experienced in 2016-17 for the grazing and erosion program due to delays in finalising delivery contracts

- the dairy program was delayed in 2016-17 as internal resources were focussed on other priorities. External specialist contracts were unavailable to progress the program in 2018.

Land management

Land Management costs are dictated by land condition and weather-related events. For example:

- there was increased expenditure on vegetation management and weed control in 2018 compared to 2016-17 in response to higher than predicted growth and favorable weather events
- hazard reduction program was not completed in 2016-17 due to unfavourable weather conditions
- increased unforeseen expenditure incurred in 2016-17 as a result of potentially contaminated lands in recreational areas.

Enforcement and surveillance

- recruitment of new staff to undertake compliance activities to replace staff departures- in 2016-17 and 2017-18
- enforcement and surveillance also covers the cost of consent transactions which vary year-on-year depending on the number of applications received, the complexity of the application and required response times.

Development Impact Assessment

- this cost item can vary year-on-year depending on short-term internal resource reallocations dependent on business needs. This item also includes costs for land use planning and catchment mining management.

Water quality science

- costs vary depending on the number of sampling events. The ability to sample is generally contingent on wet weather events
- investigation of sources of natural organic matter was lower in 2016-17 and 2017-18 as fewer than expected wet weather events occurred, reducing expenditure on sample collection and analysis.

Engaged communities

- this category includes initiatives that promote capacity building, school education, community education and community involvement. Expenditure is generally steady year-on-year but can vary depending on the timing of workshops and other community initiatives.

6.4.4 Reporting system changes

IPART's 2016-20 Determination set annual operating expenditure allowances that were based on our initial 2015 pricing proposal that was lodged only six months after the establishment of WaterNSW and the merger of SCA and SWC on 1 January 2015.

At the time of preparing our initial submission in 2015, WaterNSW captured its costs under two Financial Management Systems: Tech One for the Rural Valley business (formerly SWC) and Sun Systems for the Greater Sydney business (former SCA). The proposed expenditures submitted to IPART in 2015 were developed under Sun Systems (which excluded some WaterNSW overhead and costs), from which the data was merged using spreadsheets and data from Tech One.

Subsequent to the 2015 pricing proposal, WaterNSW consolidated its financial systems and adopted Tech One as the financial management system for WaterNSW, including both our Rural Valley and the Greater Sydney businesses.

The chart of accounts adopted in Tech One differs significantly to the chart of accounts used in Sun Systems. As a result, it is problematic to trace determination costs on a project-by-project basis to the actual costs captured in our current Financial Management System, Tech One.

In addition, WaterNSW has adopted a different methodology of allocating costs compared to our 2015 Greater Sydney initial pricing proposal. In 2015, we allocated our overhead on direct salary and wages costs, whereas from 2017-18 we allocate overhead costs on a total expenditure (TOTEX) basis.

As a result, some cost categories proposed in our 2015 pricing proposal, such as contractors and hire and purchase costs, may contain little to no overhead, whereas these cost categories would attract overhead in our actual accounts, making comparison of actuals against the determination meaningless for some categories. As a result, WaterNSW's comparison of actual performance against the determination allowances has necessarily been focussed on the account categories rather than at the project level.

6.4.5 Cost savings over the 2016-20 Determination period

Achieving additional savings during a period of significant change for the industry, including the prolonged impact of drought, has been challenging. We did so by our commitment to continually improve the efficiency of our business and prioritise our allowances to improve customer outcomes. We were also committed to capturing the value of new technologies to improve our operations, the benefits of which are expected to be realised in the final year of the current determination period (2019-20) and throughout the four years of the 2020-24 Determination.

To achieve cost savings we:

- significantly restructured our business. Our new organisational structure supports more efficient end-to-end process delivery
- continued to improve processes and initial investment in information technology systems to increase efficiency and enhance customer service outcomes
- implemented robust expenditure governance frameworks that focus on delivering prudent and efficient outcomes.

During the 2016-20 Determination Period, WaterNSW developed and implemented initiatives to prudently manage its cost base and drive continuous efficiency improvement. These initiatives include the following:

- a rigorous bottom-up annual budgeting process, requiring business units to substantiate budget allocations

- strong review of business cases under the "Approval to Spend" framework, requiring expenditure proposals greater than $250,000 to be reviewed by the Investment Review Committee before being considered for approval by Financial Delegates

- financial delegations which contain category restrictions (e.g. ICT purchases can only be made with approval of the Executive Manager ICT, Legal Services can only be obtained with approval of General Counsel and Fleet purchases can only be made by the Fleet Manager)

- significant improvements in procurement capability, including the implementation of a centre-led category management procurement model, development of category management plans for major areas of expenditure and informing the procurement strategies for subsequent tender exercises. Through stronger procurement exercises we have been able to deliver savings – for example; in water monitoring laboratory services, water monitoring field services, telecommunications and several major software contracts.

- strategic reviews, including:

    - **Water monitoring** – the review of optimal service levels, insource/outsource mix and resourcing levels and structure realignment of this function. This resulted in a greater share of insourcing, but a cost reduction at the whole-of-activity level

    - **Land management** – a joint review between the NSW Office of Environment and Heritage (OEH) National Parks and Wildlife Service (NPWS) and WaterNSW was undertaken of land management activities being undertaken by NPWS in the drinking water catchments, with activities being classified into basic landowner responsibilities (which OEH must fund), and activities which provide a benefit to drinking water quality (which WaterNSW undertakes on behalf of water consumers). This resulted in a reduction in the annual funding from 2017-18 to OEH specifically for land management activities for which WaterNSW has been historically required to pay OEH under the NPWS funding arrangement. The arrangement is now maturing into a fit-for-purpose service agreement

    - **Firefighting** – a review between OEH (NPWS), the NSW Rural Fire Service (RFS) and WaterNSW of optimal Special Area fire-fighting arrangements was undertaken, resulting in WaterNSW determining it will no longer undertake front-line firefighting activities. WaterNSW has since undertaken a tender exercise for rapid aerial response, front-line fire-fighting and hazard reduction activities which was awarded to RFS. This results in an increase in costs relative to historic levels, but resourcing levels provide a safety improvement to WaterNSW staff and the community and ensures the appropriately skilled personnel are managing and responding to fires

    - **Fleet** – a review of optimal vehicle asset types and configurations was undertaken, resulting in improved standardisation and lengthening of the target holding life to five years. Whilst the review was undertaken a backlog of vehicles due for replacement has accumulated and this is currently being addressed, driving a temporary increase in vehicle purchases. As vehicles are being replaced, the need for the vehicle is also being reviewed.

These initiatives have helped offset cost increases in other areas (e.g. land tax, water monitoring costs, increases in land management costs, increased maintenance activities, higher land contamination costs, increases in Shoalhaven pumping costs and increases in insurance contributions) and to ensure WaterNSW has 'lived within its means' and within PART's cost allowances during the 2016-20 Determination period.

We will continue to look for opportunities to achieve better value for money through improved procurement practices and undertaking strategic reviews of expenditure areas over the 2020-24

Determination period. These will assist in managing other unexpected costs and ensuring we operate within the next determination expenditure allowance.

We are proud of the efficiencies we have achieved over the current regulatory period and their ongoing benefit to Greater Sydney customers. We are committed to continually improving the efficiency of our business over time.

6.5 Our approach to forecasting operating expenditure

We have forecast operating expenditure at the level required for a prudent business acting efficiently and in accordance with good industry practice.

Our operating expenditure proposal utilises a 'bottom-up' cost build for 2019-20 based on budgeted expenditures which have been adjusted to account for non-recurring expenses. 2019-20 represents our base year, which is extrapolated over the regulatory period taking into account anticipated changes in obligations, service delivery, demand and operations.

We applied a robust process to develop our operating expenditure proposal with detailed input from across the business. WaterNSW has:

- adopted an outcomes-based approach that puts productivity at the forefront of all decision-making and is focussed on achieving efficiencies, while maintaining levels of service and maintaining appropriate risk levels
- undertaken 'bottom–up' reviews and long-term financial plans to identify efficiencies. In particular, we implemented enhanced internal governance arrangements (as discussed in the following section), subjecting each change proposal to management review and prioritisation. These reviews had the context of ensuring our proposal provides value to Greater Sydney customers over the regulatory period
- developed our operating expenditure proposal in conjunction with our capital expenditure and ICT plans, because they are highly interrelated. We manage our assets to deliver the required service for optimal lifecycle costs at an acceptable level of risk. This approach involves selecting from operating levels and capital expenditure to deliver the lowest life-cycle cost
- replaced our engineering work management systems (MAXIMO) and adopted a Consolidated Information Management System (CIMS). CIMS has provided us with a step improvement in managing and forecasting the costs around job plans at a granular level.

6.5.1 Improving governance arrangements

WaterNSW has developed and implemented a best practice procurement governance process. The operating expenditure programs that form the basis of our proposal are subject to these arrangements include:

- an Approval to Spend (ATS) framework for expenditure and investment evaluation and governance. The ATS framework ensures that WaterNSW makes prudent and efficient decisions that ensure effective delivery of customer and business objectives and represent value-for-money. The ATS framework ensures that appropriate consultation on major investment decision occurs across the business, prior to proceeding

- the ATS framework applies to all WaterNSW personnel seeking to incur expenditure on behalf of WaterNSW. All expenditure is to be prudent (only incurred when required), efficient (value-for-money) and justifiable

- for operating expenditure proposals under $20,000, documentation clearly articulating the need/problem being addressed, options considered, justification of recommended option and demonstration of value-for-money is prepared, with approval to spend being provided under the Financial Delegations (e.g. by Manager or Executive Manager) before proceeding

- for operating expenditure proposals over $20,000, ATS documentation is prepared with consultation and review gateways according to the relevant process (i.e. depending on nature and size of expenditure) with approval according to the Financial Delegations and the Project Delivery Framework (as applicable).

Further information on governance and decision-making for WaterNSW expenditure is presented in Attachment 1 'Governance and decision-making framework'.

6.5.2 Updating our approach to cost allocation

WaterNSW's regulated charges are set according to four IPART pricing determinations: Greater Sydney Determination, Rural Valleys Determination, WAMC Determination and the Murray River to Broken Hill Pipeline Determination. A core element for managing these separate regulatory processes is the adoption of a clear, concise and effective approach to the allocation of direct and indirect costs.

Our approach for allocating costs is set out in our Cost Allocation Manual (CAM) which has been prepared in line with the IPART Cost Allocation Guide. Our CAM is provided as Attachment 4.

As outlined in our CAM, overhead (i.e. costs that have not been directly charged to a project) is allocated evenly across all the projects covering WaterNSW's core regulatory activities and routine non-core activities, using total expenditure on each project (capital and operating expenditure) as an allocator. In this way, net overhead is apportioned to all of WaterNSW's regulated pricing proposals depending on whether a particular project can be mapped to a particular determination.

Table 6.3 below sets out the annual changes to the proportion of overhead allocated to Greater Sydney. Overall, WaterNSW has allocated a percentage of overhead to its Greater Sydney business which is marginally higher than in the current Greater Sydney Determination and Rural Valley Determination.

Table 6.3 – Movement in allocated costs ($millions, $nominal)

Segment	Rural Valleys determination % (2017-18)	2016-17 (%)	2017-18 (%)	2018-19 (%)	Average FY21 to FY24 (%)
Allocation basis	55%:45%	55%:45%	TOTEX	TOTEX	TOTEX
Greater Sydney (%)	55%	55%	52%	58%	63%*
Rural Valleys (%)	45%	45%	37%	32%	24%
WAMC (%)	N/A	N/A	11%	10%	13%
Total allocated costs ($M)	43	63	53	60	49

Notes: Excludes Broken Hill Pipeline and non-core/regulated expenditure in FY18, FY19 and future years.[31]
* Approximately $31 million per annum on average, or $124 million in total, over the four years of the 2020-24 Determination period.
Source: WaterNSW analysis

As illustrated in Table 6.3 above, WaterNSW has undertaken a focussed effort to improve the reporting of costs to individual projects (i.e. direct costs). This has resulted in the pool of overheads to be allocated reducing substantially since 2016-17, thereby improving the accuracy of our reporting at the project level. We also note that on the transfer of WAMC functions to WaterNSW in 2016, we were provided with insufficient allowance for corporate ICT systems, thereby placing additional pressure on our ability to reduce costs.

6.5.3 Improving program planning and management

Under clause 5.1.1 of its operating licence, WaterNSW is required to maintain an Asset Management System (AMS) that is consistent with ISO 55001. The AMS allows WaterNSW to effectively plan, manage and identify issues and risks related to the integrity of its asset and or public health. WaterNSW is required to fully implement its AMS and carry out all relevant activities in accordance with the AMS.

Prior to 2017, WaterNSW had undertaken a series of external audits on its AMS in preparation for ISO 55001 certification, in line with its operating licence requirements. The outcome of the audits was certification of WaterNSW's AMS to ISO55001 on 10 January 2017. Although certification was gained, a comprehensive continuous improvement plan was developed.

Subsequent to the certification WaterNSW:

- maintained certification in 2017 and 2018 through the successful completion of a number of surveillance audits by the certifying body
- improved the AMS to support its evolving business requirements through a revised Asset Management Policy, Strategic Asset Management Plan and Asset Management Objectives
- implemented measures to ensure consistency and alignment with WaterNSW's 2018- 2021 Corporate Strategic Plan
- in addition to the external audits, WaterNSW completed internal system assurance audits on its AMS as well as process health audits of key AMS processes in 2018.

[31] In FY17 the overhead 45/55 split between Greater Sydney and Rural Valleys (as approved by IPART) was applied to Rural Valley and Greater Sydney expenditure including both regulated expenditure and non-regulated/core plus expenditure. This resulted in $32.5 million in core overhead allocated to Greater Sydney and $23.6M of core overhead allocated to Rural Valley. The balance of $6.8 million was allocated to non-core/non-price regulated RV and Greater Sydney functions such as MDBA constructing authority expenditure. In FY17 WAMC did not attract corporate overhead as WAMC corporate costs were ring fenced until WAMC functions and staff were fully integrated into WaterNSW's organisational structure.

In 2019, WaterNSW replaced and consolidated its legacy administrative systems with a consolidated information management system (CIMS) based on commercial enterprise resource planning (ERP) technology. In parallel, WaterNSW also carried out a comprehensive review and implemented significant improvements to its asset hierarchies and maintenance plans in an effort to ensure that the asset management system (AMS) is fully implemented in accordance with WaterNSW's operating licence requirements.

The implementation of a consolidated computerised maintenance management system (CMMS) as a component of CIMS enabled the replacement of legacy spreadsheets with more modern and comprehensive asset planning tools and planning and prioritisation software. WaterNSW expanded and improved upon the quality of its asset database. WaterNSW also identified and sought to address any data inconsistencies between the AMS and its program of works.

As the consolidated CIMS matures, WaterNSW will continue to pursue opportunities to make the AMS more robust and comprehensive through a combination of refining processes and procedures and improving upon the quality of its asset data and analytical capabilities. WaterNSW is committed to ensuring its AMS maintains ISO certification in line with acceptable industry standards in accordance with the WaterNSW's operating licence.

6.5.4 Accounting policies

Our proposed expenditure profiles have been prepared in accordance with:

- applicable Australian Accounting Standards (which include Australian Accounting Interpretations)
- applicable International Financial Reporting Standards
- Financial Reporting Directions mandated by the NSW Treasurer, including Treasury Circulars and Treasury Policy Papers
- accounting policy legislation, including the requirements of the Part 3 of *the Public Finance and Audit Act 1983* (where applicable), *Government Sector Finance Act 2018* (where applicable), the associated requirements of the Public Finance and Audit Regulation 2015 (where applicable) and the *State Owned Corporations Act 1989*.

We have applied our internal accounting policies to identify the forecast expenditures that are related to capital expenditure and those expenditures that should be expensed. Our capitalisation policy, as updated from time to time, sets out the criteria determining whether an asset is created and the materiality thresholds to assess whether an asset should be capitalised or expensed.

Our capitalisation policy complies with the NSW Treasury Policy TPP06-6 "Capitalisation of Expenditure on Property, Plant and Equipment", which is consistent with relevant Accounting Standards including AASB 116 Property, Plant and Equipment.[32] AASB 116 provides guidance on the costs (including corporate costs) which can be capitalised as part of Property, Plant and Equipment.

In the provision of bulk water services, WaterNSW constructs, maintains and enhances a significant amount of property, plant and equipment. WaterNSW incurs corporate support costs which are triggered by capital and operating projects related to this property, plant and equipment. Corporate support costs have been allocated to projects and determinations as specified in our CAM. Our CAM provides a practical approach to identify and allocate a

[32] https://arp.nsw.gov.au/sites/default/files/tpp06_6.pdf

supportable proportion of corporate costs to capital projects consistent with the AASB 116. Our CAM is provided as Attachment 4 of this pricing proposal.

Under the updated AASB 16 Leases which applies from the 2019-20 financial year, operating lease payments are now recognised in the balance sheet. Our consolidated accounts will reflect the updated standard. However, the IPART secretariat has expressed a preference for regulated entities to continue to treat operating lease payments as an expense item for pricing purposes, contrary to the new standards. On this basis, WaterNSW's continues to treat operating leases as an expense item in its proposed expenditures.

WaterNSW is currently in the process of implementing new and improved reporting systems and analytical capabilities to identify operating leases payments for future regulatory reports as well as to comply with the updated AASB 16 standards.

6.6 Proposed operating expenditure for the 2020-24 Determination period

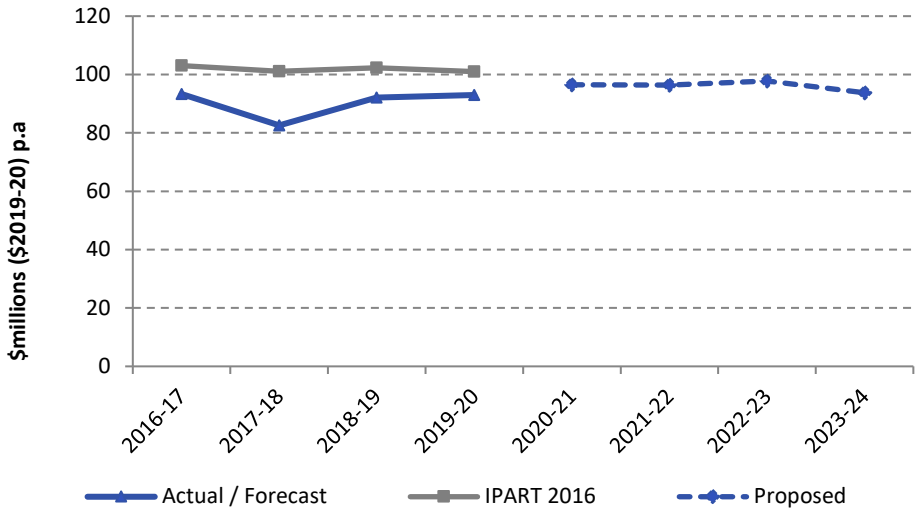
This section sets out how we have forecast the main components to the operating expenditure involved in running our business. Current costs are based on current activities and outputs and going forward costs will change due to changes in outputs, trends in inputs costs and improvement practices.

For the 2020-24 Determination period, we are proposing operating expenditures of $384 million ($2019-20), which represents a $23.0 million, or 6.4%, decrease from IPART's allowances in the 2016-20 Determination.

As discussed in section 6.7.8, we have applied a productivity adjustment of 1% to our proposed operating expenditure program to demonstrate our commitment to continuing to achieve efficiency gains and placing downward pressure on water prices for customers.

Our proposed operating expenditure compared to historical expenditure and IPART's allowance from the 2016-20 Determination is provided in Figure 6.3.

Figure 6.3 – Operating expenditure allowance and actual operating expenditure 2016-17 to 2019-20, proposed operating expenditure 2020-21 to 2023-24 ($millions, $2019-20)



Source: WaterNSW analysis

The increase in proposed operating expenditure from 2019-20 to the forecast expenditures over the 2020-24 Determination period is due to a range of activities, including an increase in water monitoring, increases in land management costs, increased maintenance activities, higher land contamination costs and increases in insurance premiums.

WaterNSW's operational expenditure plan for the 2020-24 Determination period will enable us to deliver the regulated services more efficiently and support the expected growth across the region.

Operating expenditure funds activities directly impacting on our assets as well as functions that support business operations. Table 6.4 provides a breakdown of our proposed direct and indirect operating expenditure within Greater Sydney.

Table 6.4 – Total proposed operating expenditure ($000's, $2019-20)

Expenditure	2016-20 Average	2020-21	2021-22	2022-23	2023-24	Total FY21-24
Dam Safety	7,618	8,759	7,947	7,870	7,511	32,087
Environmental planning and protection	851	1,074	1,041	1,079	867	4,061
Water delivery and other operations	24,586	27,990	28,895	29,337	29,059	115,280
Asset management and planning	1,511	1,325	1,305	1,319	1,265	5,215
Maintenance	23,229	24,729	24,560	24,594	23,453	97,336
Catchment management	26,554	29,216	29,211	30,152	28,190	116,769
Other	5,897	4,392	4,414	4,417	4,348	17,571
Efficiency	N/A	-975	-974	-988	-947	-3,883
Total operating expenditure	**90,246**	**96,510**	**96,400**	**97,779**	**93,746**	**384,435**

Source: WaterNSW analysis

The components of our proposed operating expenditure as outline in Table 6.4 are discussed below.

6.6.1 Dam safety compliance

WaterNSW is forecasting dam safety expenditures of $32.1 million ($2019-20) over the 2020-24 Determination period, or approximately 5.3% higher than our expected actual costs over the current 2016-20 Determination period.

Dam Safety Compliance comprises the following activities:

- **Dam safety inspections** – WaterNSW has a program of routine, yearly and five-yearly dam safety inspections, which comply with the requirements of the Dam Safety Committee (DSC) and Australian National Committee on Large Dams
- **Security services** – [redacted] in accordance with the NSW Dam Safety Committee DSC-2H – Security Dams and the auspices of the National Counter Terrorism Plan 2017 (Australian National Security)
- **Portfolio Risk Assessment (PRA)** – periodic review of WaterNSW's portfolio of large dams in Greater Sydney to quantify the risk profile for each dam and identify potential mitigation measures
- **Incident planning, training and preparation** – Training and planning serves as a preventative risk mitigation tool and damage reduction function, to minimise the risk of loss,

damage, misuse or exposure to people, assets or information

- **Other dam safety related activities** – such as instrumentation and monitoring.

A major driver of increased expenditure from 2019-20 to 2023-24 is the requirement for WaterNSW to carry out post-PRA follow up studies. The aim of the studies is to better understand and refine the risk positions of dams that reside outside tolerable risk ranges, as identified in the 2018 PRA report.

6.6.2 Environmental planning and protection

WaterNSW is forecasting environmental planning and protection expenditures of $4.1 million ($2019-20) over the 2020-24 Determination period.

Environmental planning and protection expenditures over the upcoming determination period are driven by a forecast of approximately $1.0 million per annum, which includes an increase of approximately $0.5 million per annum from 2020-21 onwards, to assess and manage the risks associated with contamination and hazardous building materials on WaterNSW land.

WaterNSW also undertakes other activities relating to environmental requirements and standards, such as development impact assessments and mining rectification works. The costs of undertaking development impact assessments are contained in our section on catchment management, while the costs of carrying out mining rectification works are accounted for as maintenance costs.

6.6.3 Water delivery and other operations

Expenditure on water delivery and other operations is forecast at $115.3 million ($2019-20) over the 2020-24 Determination period, or approximately 17.2% higher than our expected actual costs over the current 2016-20 Determination period. In summary, the increase is due to:

Our expenditure on water delivery and other operations supports the principles and objectives set out in our operating licence and the WaterNSW Act, including the need to supply raw water to Sydney Water Corporation as well as other customers, protect public health, public safety and the environment and to maintain adequate reserves of water and ensure continuity of supply.

Our expenditure on water delivery and other operations include the following activities:

- **Water monitoring** – including water quality monitoring, water quantity monitoring, field services, analytical services, and water data systems and information. Water monitoring provides a basis for WaterNSW to understand water quantity and quality risks, assess the impacts and effectiveness of management activities and ensure that the information collected through hydrometric, field sampling and analytical contracts meets compliance and operational needs

- **Water modelling and advice** – water modelling supports all facets of our business. Our water modelling unit operates and maintains our river operational models, planning models, water security modelling and provides technical support for infrastructure planning and to improve modelling software capabilities and water data systems

- **System operations** – ensuring bulk water is delivered efficiently and effectively to our customers in accordance with service standards and the requirements specified in our bulk water contracts and imposed upon WaterNSW under regulations. This activity includes general costs incurred as part of our day-to-day water operations, including pumping cost, supply planning and configuration, Fish River bulk water purchases and WAMC licensing

costs

- **Other costs** – such as planning costs for the development of our Metropolitan Water Strategy and costs associated with risk management and compliance.

6.6.3.1 Water monitoring

The monitoring of our storages and surface water, including the collection of and subsequent management of water data enables the successful delivery of water to our customers including the environment. Water monitoring is required for the early warning of risks, reporting obligations for licences, operational requirements and for long-term data analysis and catchment management.

Our forecast expenditures on water monitoring comprise approximately 44% of our projected total expenditure on water delivery and other operations.

Water monitoring consists of routine and non-routine components.

WaterNSW's proposed expenditures reflect a steady state environment compared to the 2016-20 determination period. Over the 2020-24 Determination period, WaterNSW has implemented an operating model which features a consolidation of service contracts and greater utilisation of in-house capabilities that harmonise processes and deliver optimal pricing outcomes for customers.

WaterNSW proposed expenditure is also driven by specific IPART operating licence requirements, including the requirement for WaterNSW to maintain a Water Quality Management System and also, but not limited to, macroinvertebrates monitoring requirements under clause 4.1.1 of the Operating Licence Reporting Manual.

Additional water monitoring requested by Sydney Water

The Raw Water Supply Agreement (RWSA) states that WaterNSW monitors the raw water it supplies to Sydney Water in accordance with its Operating Licence and Water Monitoring Program, as agreed with NSW Health.

WaterNSW's raw water monitoring program covers data from catchment up to and including the inlets of water filtration plants. The water quality data is currently used by WaterNSW for multiple purposes including operations, compliance and research.

Sydney Water (including privately owned and operated water filtration plants) also has its own monitoring plans at the raw water monitoring points to meet operational and contractual reporting needs. There is some overlap in the monitoring plans which are driven by similar factors to:

- meet customer needs (supply of safe drinking water)
- manage operational risk
- meet regulatory licensing and reporting
- manage contractual performance.

During the review of the RWSA, Sydney Water requested a material change to the Water Quality Monitoring Program.

Sydney Water has identified, for each water filtration plant, additional monitoring which is

intended to provide data that will enable Sydney Water to optimise the operations of its water filtrations plants. As this additional monitoring increases the frequency of sampling or range of analyses for a number of locations in WaterNSW lakes near the offtakes, or in WaterNSW delivery infrastructure, Sydney Water has requested WaterNSW undertake the monitoring as this represents the most efficient way to gather the additional data.

Nevertheless there will be an increase in monitoring costs (field services and laboratory) of over the 2020-24 Determination period.

WaterNSW understands that Sydney Water has assessed that the resultant efficiencies in filtration plant operations will exceed the cost of the additional monitoring, resulting in lower costs to Sydney Water's customers, as outlined in Sydney Water's pricing proposal. WaterNSW and Sydney Water have agreed that the additional monitoring is subject to the cost being included by IPART in the WaterNSW's next pricing determination.

6.6.3.2 Modelling and analysis

Our modelling expenditures in the current determination were focussed on long-term system planning, general modelling advice and support and management of our water data systems. An increase in expenditure is expected in 2019-20 as a result of the Water Supply Systems Yield Review which is a requirement of our operating licence.

WaterNSW is required, by the first quarter of 2021, to engage a suitable qualified expert to:

- review our modelling and procedures for calculating system yield to ensure that it reflects good industry practice
- test the robustness of WaterNSW's modelling, including key assumptions and the procedures for calculating system yield.[33]

Our proposed modelling expenditure over the 2020-24 Determination period represents approximately 11.5%, or $3.3 million ($2019-20) per annum of projected total expenditure on water delivery and other operations. Our proposal reflects standard business as usual activities with a focus on improving our modelling software capabilities. In addition, WaterNSW will carry out climate change yield research studies to support the development of a climate change adaption strategy.

WaterNSW modelling and analysis functions also include spatial data management, modelling and spatial data strategy implementation. The cost of this function has been incorporated in our Asset Management and Planning cost category described in Section 6.6.4. As part of our Water Quality Management System, resources are dedicated to the analysis of incoming water quality data, interpretations and forecasting of potential changes to ensure we continue to provide the best possible water quality to our customers in all circumstances.

6.6.3.3 System operations

This cost category represents approximately 25%, or $7.2 million ($2019-20) per annum of projected total expenditure on water delivery and other operations to support the delivery of water in required quantities at the appropriate quality to customers in the Greater Sydney area of operations, incident response, monitoring and notification, routine and systems monitoring, scheduling of major outages, and flood operations among other operational activities.

Expenditure on system operations are driven by WaterNSW supply agreements with its

[33] Clause 2.6 of the WaterNSW operating licence

customers, supply operational protocols and operating requirements imposed upon WaterNSW by the relevant Water Sharing Plans for the Greater Sydney metropolitan area, water management laws, and IPART operating licence requirements. They include internal costs, operational costs such as pumping, licensing costs and bulk water purchases from the Fish River Scheme into the Blue Mountains supply scheme as a water balancing measure.

System operations costs relating to Fish River bulk water transfers and WAMC licensing fees are described in further detail in Section 6.7.6 and Section 6.7.7 below, respectively, and in Appendix F.

6.6.3.4 Water delivery - other costs

Other costs include compliance-related expenditure for the annual IPART operating licence audit, risk management costs, and planning costs for the development of our Metropolitan Water Strategy.

6.6.4 Asset management and planning

Asset management and planning expenditures over the upcoming determination period include spatial data management and strategy implementation which support our asset surveillance and maintenance capabilities, continuous improvement and other planning-related activities.

6.6.5 Maintenance

Our operations and maintenance operating expenditure forecast is $97.3 million over the 2020-24 Determination period, or approximately 4.8% higher than our expected actual costs over the current 2016-20 Determination period.

Maintenance operating expenditure is forecast using a combination of historical unit costs, market-tested rates and forecast resource requirements to deliver the services. The works program is delivered using a combination of our internal workforce, external suppliers, and contractors to ensure that efficient and lowest sustainable cost activities, projects and work program resources are maintained over the long-term.

Our maintenance forecast includes both planned and condition-based maintenance, corrective maintenance, mining rectification works, fencing in declared catchments, SCADA support and maintenance and routine and non-routine maintenance for our hydrometric monitoring network.

Our maintenance operating expenditure is aligned with our AMS which defines roles and responsibilities for asset management. The WaterNSW Strategy Asset Management Plan specifies the Asset Management Objectives. It outlines how assets are managed in alignment with the relevant Statement of Corporate Intent, Operating Licence obligations and Corporate Plan.

The asset planning process is designed to reduce the life-cycle costs of assets while maximising asset performance and reducing risk to as low as reasonably practicable. The process involves identifying solutions to address current risks from which options are developed and evaluated based on asset condition and capability information obtained from maintenance outcomes and periodic specialist auditing program.

The increase of 4.8% over the period is due to …

6.6.6 Catchment management

Our catchment management operating expenditure forecast is $116.8 million ($2019-20) over the 2020-24 Determination period, or approximately 9.9% higher than our expected actual costs over the current 2016-20 Determination period.

A principal objective under the WaterNSW Act is to ensure that the Sydney Catchment Area is managed and protected in a way that promotes water quality, the protection of public health and public safety, and the protection of the environment.

Costs are made up of expenditures to protect the health of the Sydney Catchment Area and to ensure reliable, quality drinking water is available for the approximately five million residents of Sydney and the Illawarra, Blue Mountains, southern highlands, Goulburn, and Shoalhaven regions.

These costs are primarily a function of compliance with regulatory obligations. For instance, source water improvement and protection is governed and directed by our responsibilities under the Water NSW Act (s. 6(1)(c), 7(1)(g), 7(1)(h), 71(j)(j), 7(1)(k) and 47(2)), State Environmental Planning Policy (Sydney Drinking Water Catchment) 2011, the Australian Drinking Water Quality Guidelines 2011, and to responses to weather events (such as fire and flood).

The six areas of focus for WaterNSW under its catchment management protection functions include:

- **Source water protection** – Source water protection is governed and directed by responsibilities under the Water NSW Act, SEPP 2011, the Australian Drinking Water Quality Guidelines, and requirements of NSW Health. A principal objective is to manage and protect the Sydney Catchment Area in a way that promotes water quality, the protection of public health, and the protection of the environment

- **Land management** – WaterNSW has responsibilities as a land owner and manager within the Sydney Catchment Area. Land management activities include erosion control, derelict mine management, pest and weed detection and eradication, heritage site management, unauthorised access control, and fire regime planning and management

- **Water quality science** – WaterNSW collects a wide range of scientific and spatial information to undertake risk assessments and investigations, increase understanding and insight about pollutants and their behaviour, improve monitoring and analysis, and prioritise actions to promote catchment water quality. WaterNSW works with the water industry, government agencies, research partners, and the community, to ensure that we use the best scientific evidence available

- **Enforcement and surveillance** – WaterNSW has responsibilities under the Water NSW Act, Protection of the Environment Operations Act 1997, and the Water NSW Regulation 2013 to protect water quality in the Sydney Catchment Area. WaterNSW works with its partners including the National Parks and Wildlife Service, NSW Fisheries, local councils, NSW Police and the community to satisfy these obligations

- **Development Impact Assessment** – WaterNSW receives from planning authorities a range of development proposals in response to population growth, general intensification of land uses and for resource extraction and processing. WaterNSW assesses these proposals from the perspective of further impacts on water quality as required by SEPP 2011

- **Engaged communities** – WaterNSW works and engages with residents and landholders, community organisations, schools, businesses, local councils, and government to support the long-term management of drinking water.

Our forecast reflects our current obligations with respect to catchment management and protection activities taking into account future strategic approaches to risk reduction including, but not limited to:

- land management services, such as fire management, management of recreational areas, and pest and weed control
- targeted source water protection program, including responding to:
    - grazing and erosion water quality risks
    - urban storm water risks
    - risk arising from diary activities such as waste management, juvenile paddocks and laneway risks.

Our proposed catchment management operating expenditure is provided by service stream in Table 6.5 below.

Table 6.5 – Proposed catchment management operating expenditure ($000's, $2019-20)

Service stream	2016-20 average	2021	2022	2023	2024	Total
Water Quality Science	1,344	2,366	2,515	2,622	2,500	10,004
Engaged communities	1,033	1,122	1,142	1,153	1,106	4,523
Land Management	16,276	16,990	17,258	17,206	16,636	68,090
Enforcement and Surveillance	485	871	895	903	867	3,536
Development Impact Assessment	3,126	2,605	2,618	2,666	2,613	10,502
Source Water Protection	4,291	5,263	4,782	5,601	4,468	20,114
Total proposed Catchment Management operating expenditure	**26,554**	**29,216**	**29,211**	**30,152**	**28,190**	**116,769**

Source: WaterNSW analysis

6.6.7 Other

Over the 2020-24 Determination period, the 'other' cost category includes expenditure on Treasury Management Fund (TMF) contributions for insurance, land tax provisions and miscellaneous corporate activities such as stakeholder engagement. The TMF premiums for Greater Sydney were derived by multiplying an estimate of the total TMF premium by the proportional replacement value of Greater Sydney bulk water assets.

Actual expenditure in the 2016-20 Determination period consists of a combination of corporate and operational projects such as procurement management and property expenses and management, including land tax provisions.

6.6.8 Productivity adjustment / efficiency dividend

In order to consolidate our productivity gains and maintain our momentum for growth in productivity going forward, we have included a 'top down approach' to our forecasting by including productivity targets across our proposed expenditure.

We are focussed on improving productivity over the regulatory period. While challenging, we

propose an annual efficiency target of 1% of our base operating costs each year from 2020-21. This target equates to an $1.0 million per annum reduction in our proposed operating expenditures over the determination period.

Our proposed annual efficiency target compares favourably with efficiency targets in other jurisdictions (which average around 1% per year of total operating expenditure). Some regulators apply efficiencies to subsets of operating expenditure (for example, controllable or discretionary costs) so, to help comparisons, we converted headline efficiency targets to a common base of total operating expenditure. Our proposed efficiency target of 1% applies to our total base water operating costs.

Achieving the 1% annual efficiency target against our base water operating costs will be a challenge, especially while maintaining our level of service, meeting our regulatory obligations, managing risks and meeting future challenges. It will become progressively more difficult each time we make cost reductions.

Efficiency gains will be delivered through a rigorous budget planning process where all cost items are examined in detail and that seek to ensure least cost methods are used to deliver the expected level of service. In relation to capital expenditure, WaterNSW's proposal will ensure that expenditure is in line with best practice asset management and no unnecessary capital expenditure is incurred.

Efficiency savings incorporated into our proposed operating expenditure for the 2020-24 Determination period include:

- a productivity adjustment (or efficiency dividend) of 1% per annum, or $3.9 million over the four years
- the continuing savings from the co-location of staff to the Parramatta office. This move to consolidate our Sydney operations into one office in Parramatta and closing the Sydney CBD office has resulted in ongoing permanent savings of approximately $1.5 million per year (of which 60% of these cost savings are allocated to the Greater Sydney determination
- the ongoing impacts of procurement savings as discussed in Section 6.4.1.

6.6.9 Allocated cost forecasts

Our allocated operating expenditure forecast consists predominately of corporate expenses for the 2020-24 Determination period is $124.0 million ($2019-20), or approximately $31 million per annum.

Allocated support costs predominately relate to the following functions:

- **Customer and Community** – managing customer relationship through sales, billing, revenue management and product development. Supporting our customers through effective systems and processes
- **Safety, People and Performance** – developing and implementing safety / environment / Human Resources systems and training programs and safety / environment / Human Resources policies and standards. This also includes change management and industrial relations, payroll and safety management expertise

- **Finance and Commercial Services** – providing accurate financial information, managing pricing regulation strategy and reform, and business analysis and review, procurement, property, land and fleet management

- **Legal, Governance and Risk** – providing legal advice and support to the business and establishing and maintaining risk management, compliance and assurance functions (including internal audit)

- **Business Systems and Information** – providing communication and technology strategies, services and capabilities.

The proposed costs for the 2020-24 Determination period for the support functions identified above along with Executive team costs allocated to Greater Sydney are provided in Table 6.6 below. The total proposed corporate support operating expenditures are comprised of corporate support costs and indirect operational costs associated with functions such as asset delivery, system operations and water and catchment protection. The percentage of the total WaterNSW corporate support costs allocated to Greater Sydney is also shown in Table 6.6 below.

Table 6.6 – Proposed corporate support operating expenditure ($000's, 2019-20)

Category	2020-21	2021-22	2022-23	2023-24	Total
Customer and Community	2,280	2,387	2,488	2,092	9,248
Safety, People and Performance	3,615	3,701	3,833	3,172	14,320
Legal, Governance and Risk	3,359	3,521	3,597	2,988	13,466
Business Systems and Information	7,803	8,350	8,691	7,786	32,630
Finance and commercial services	3,818	3,869	4,069	3,479	15,235
Executive Team	2,324	2,342	2,438	2,065	9,170
Subtotal corporate support costs	**23,199**	**24,170**	**25,117**	**21,582**	**94,069**
Operational Allocated Costs	7,453	7,451	7,559	7,517	29,980
Total allocated costs	**30,653**	**31,621**	**32,676**	**29,099**	**124,049**
% of total corporate support allocated to Greater Sydney	63%	66%	67%	57%	63%

Source: WaterNSW analysis

Our forecast is based on each business unit identifying the resources and support required to deliver on our core functions. The costs are estimated based on previous costs and known information about changes in costs and business objectives.

Allocated operating expenditure includes the costs that are associated with WaterNSW services for the Greater Sydney area and reflect the cost allocation approach set out in our CAM as provided in Attachment 4.

The projected increase in the costs allocated to Greater Sydney in 2021-22 is in line with the projected increase in capital expenditures, which is proportionately higher compared to the capital expenditure needs projected in WaterNSW's other regulated business segments. The decline in allocated costs from 67% in 2022-23 to 57% in 2023-24 is due to a reduction in Greater Sydney capital expenditure relative to other regulated business segments in that year.

6.6.9.1 Information and Communications Technology

In response to the evolving business needs and changing environment, WaterNSW refreshed its ICT Strategic Plan in February 2019. The ICT Strategic plan proposed the roadmap for nine strategic programs in addition to the business as usual projects to support existing and future

business demands.

ICT has set an objective to minimise costs whilst delivering appropriate fit-for-purpose solutions to enable the delivery of the business objectives and strategic plan. Within this envelope we are continuing to improve the Information Technology Infrastructure Library services and delivery to improve the cost effectiveness of the services provided. The Information Technology Operational Management / Ways of Working Program will be delivering these improvements.

The forecasts are based on a total operating cost assumption although the mix of operational and capital expenditure may change. WaterNSW is a larger, more complex and more mature organisation than it was during the planning for the last round of pricing determinations. This evolution has:

- added scale and complexity especially for business wide ICT service provision
- prompted a step change in demand for ICT facilitated capability and customer value
- requires a different delivery model to ensure appropriate prioritisation and capability to deliver has been uplifted.

These additional demands will increase the operating expenditure profile.

A shift in the ICT industry moving from a perpetual licence model to a subscription model together with cloud-based service provision (both for 'Software as a Service' (SaaS) and 'Infrastructure as a Service' (IaaS) has gained pace and moved into the mainstream of how ICT providers now offer their services.

This move will influence the forward expenditure profile by increasing operating expenditure as the in-house ownership model moves to an externally hosted subscription model. WaterNSW is starting to experience these trends and anticipate this increasing as we move forward.

The major expenditure areas for WaterNSW are described below.

- **Software licensing agreements** – As with most organisations today, WaterNSW cannot operate without an effective ICT environment and the business applications which run on those environments. Generally applications can now be procured as a service (SaaS) and hosted externally or as a licence (annual or perpetual) housed either internally in our data centres or externally on cloud-based infrastructure (IaaS).

  Application vendors generally offer a maintenance agreement which covers product upgrades and support. These agreements attract an annual expense of between 18-25% of purchase price together with an annual CPI increase and represent a large component of our software maintenance expense. WaterNSW actively manage these costs with reviews of license coverage to ensure licensing is right-sized for the business and we comply with licence provisions. Recently, WaterNSW renegotiated one of the largest agreements, the Enterprise Agreement with Microsoft. This extensive negotiation delivered a material a saving of 27%

- **Telecommunications** – WaterNSW operates voice and data telecommunications services in excess of 80 physical locations spread geographically across NSW. The cost to serve varies widely between locations and this expense is one of the larger ICT based costs incurred. Provision of telecommunication services crosses a range of technologies including Optical Fibre, Radio, 3G/4G as well as traditional copper-based services. In 2018-19 WaterNSW took a major initiative as a component of the Telecommunications priority improvement project to renegotiate telecommunications agreements which yielded an annual estimated saving of 20% across the next three years.

- **Data centre operations** – WaterNSW maintains core ICT infrastructure for both Production and Disaster Recovery environments housed at the NSW Government data centres. These environments are provided as a service which includes floor space, utility costs, physical security and environmental controls (temperature/humidity). Additionally, as an element of the current data centre renewal project, WaterNSW will outsource a range of operational maintenance services with data centre infrastructure.

- **Contractor services** – WaterNSW maintains internal staffing levels to ensure business as usual operation together with level one and two support capability. To ensure efficient operation of desktop, server and network-based environment, WaterNSW engages third-party specialist organisations as necessary to undertake assessments (Health Checks) of specific technologies to ensure that configurations and implementations are in accordance with manufacturer recommendations. Additionally these organisations are contracted on an as needed basis to assist with trouble shooting and problem rectification as a level three support service.

- **Cybersecurity** – Cybersecurity and the threat of a cyber-attack or breach is an increasing risk and key priority for WaterNSW. To mitigate this threat WaterNSW is adopting an approach which focuses on education, detection, prevention, and response. The education stream targets internal staff with a combination of education and controlled assessment. The detection and prevention streams include implementation and maintenance of real time network-based applications to assess traffic for malicious activity and to reject known attack signatures, server and desktop-based antivirus services and regular active audits to test the resilience of our ICT environments. Finally the response stream involved both internal procedures and engaging external specialist organisations to monitor and act to mitigate a breach if it should occur.

- **Migration to cloud-based data management** – There is an emerging and strong ICT industry trend of organisations moving infrastructure and applications to a cloud-based service model. This trend changes the capital expenditure / operating expenditure tradeoff where ICT asset procurement is fully or partially replaced with expense-based service provision. This trend is accelerating such that some vendors are now only providing service-based products.

  WaterNSW is approaching this trend in a considered case-by-case basis and expects to maintain a hybrid model for the next infrastructure life-cycle iteration (approximately five years). We see value in adopting cloud-based services where validated in a whole of life-cycle costed business case approach. Examples include computational capacity needs to be scaled up and down rapidly, in large scale data storage where the per gigabyte cost is much lower than internal storage and where currency of versions and version control are important.

As discussed in the CAM provided as Attachment 4, movements in ICT costs allocated into Greater Sydney reflect a combination of both the ICT cost levels and the method of apportioning ICT costs to Greater Sydney. In 2017-18, WaterNSW allocated to the Greater Sydney regulated business segment approximately $6.2 million in ICT costs as an overhead based on overall expenditure. This represents a reduction from 2016-17 of $6.4 million where overhead costs were allocated based on direct salary and wages.

Table 6.7 – Proposed ICT operating expenditure ($000's, $2019-20)

	2020-21	2021-22	2022-23	2023-24	Total
Total ICT operating expenditure	7,803	8,350	8,691	7,786	32,630

Source: WaterNSW analysis

6.7 Proposed operating expenditure by expense type

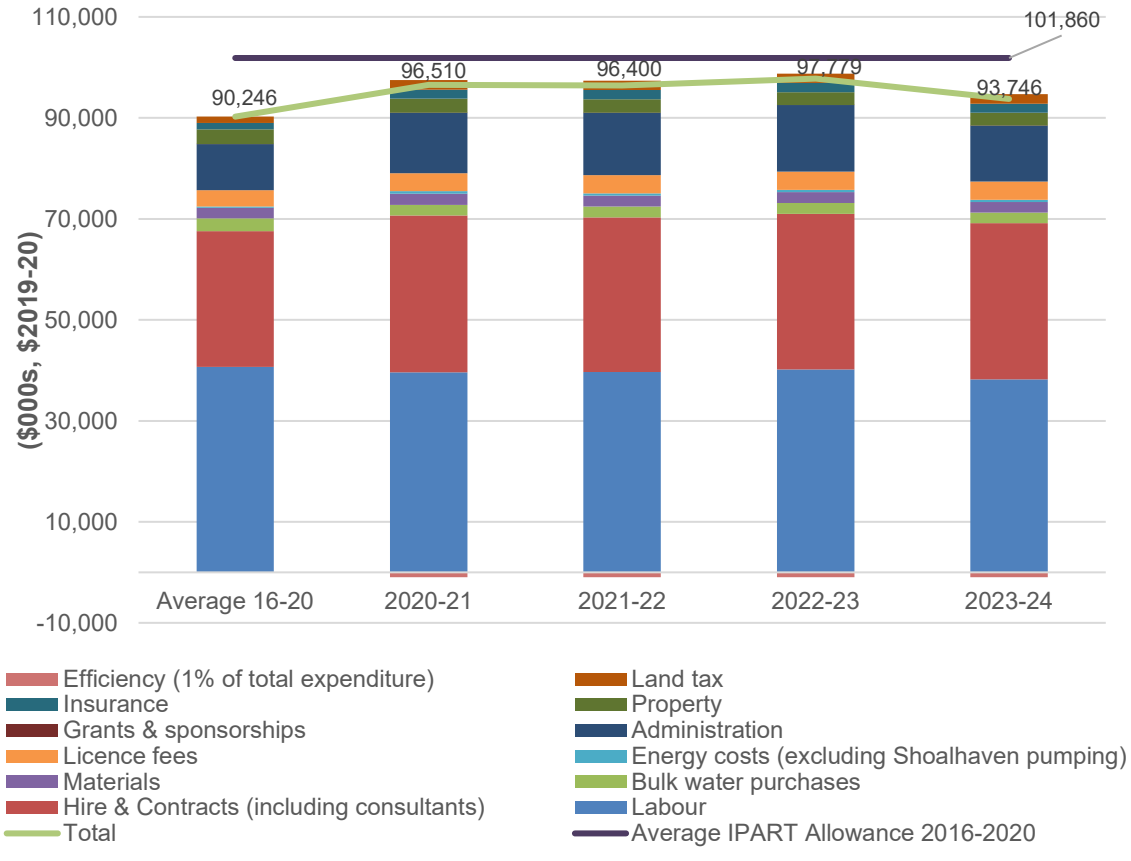
The following Table 6.8 and Figure 6.4 provides an itemised view of our proposed operating expenditure for the 2020-24 Determination period by expense type.

Table 6.8 – Proposed operating expenditure by expense type ($000's, $2019-20)

Expenditure	2016-2020 average	2020-21	2021-22	2022-23	2023-24	Total FY21-24
Labour	40,714	39,632	39,690	40,183	38,209	157,715
Hire & contract services (incl. consultants)	26,849	31,012	30,630	30,840	30,928	123,409
Bulk water purchases	2,542	2,119	2,119	2,119	2,119	8,475
Materials	2,076	2,219	2,167	2,147	2,071	8,604
Energy costs (excluding Shoalhaven pumping)	290	537	471	471	471	1,950
Licence fees	3,229	3,551	3,561	3,572	3,585	14,269
Administration	9,083	11,927	12,408	13,227	11,128	48,690
Grants & sponsorships	41	0	0	0	0	2
Property	2,926	2,789	2,630	2,511	2,486	10,415
Insurance	1,257	1,826	1,826	1,826	1,826	7,304
Land tax	1,238	1,872	1,872	1,872	1,872	7,487
Efficiency (1% of total expenditure)	N/A	-975	-974	-988	-947	-3,883
Total	**90,246**	**96,510**	**96,400**	**97,779**	**93,746**	**384,435**

Note: Table may not add due to rounding
Source: WaterNSW analysis

Figure 6.4 Total operating expenditure by category ($000's, $2019-20)



Source: WaterNSW analysis

Compared to the 2016-20 Determination period average, our projected expenditure shows a $1.3 million average reduction in labour costs, offset by a $4.0 million average increase per annum in hire and contract services into the 2020-24 Determination period.

The top six operating expenditure categories from Table 6.10 and Figure 6.4 by dollar value, which represent approximately 95% of our proposed operating expenditure for the 2020-24 Determination period are discussed in the sections below.

6.7.1 Labour-related expenditures

As illustrated in Table 6.10 above, labour costs are forecast to be $157.7 million over the 2020-24 Determination period, remaining relatively flat before reducing to $38.2 million in 2023-24 ($2019-20). Labour costs represent approximately 41% of our total proposed operating expenditure program.

Key assumptions for our labour costs include the following:

- a new Enterprise Agreement for all WaterNSW employees, superseding the legacy agreements inherited from SCA, SWC and WAMC with generally lower salary progressions and the introduction of performance bonuses
- wage escalation for 2019-20 into the 2020-24 Determination period is forecast to be flat in real terms
- general base pay (excluding bonus payments) is expected to be consistent with NSW Government Wages Policy.[34]

6.7.2 Hire and contracts expenditure and consultants

Our proposed forecasts for hire and contracts and consultants includes contractual expenditure in relation to the maintenance of WaterNSW's hydrometric monitoring network, analytical services (such as laboratory services) for water monitoring, security services, maintenance services, and external service provision for our catchment management functions such as fire response and land management.

WaterNSW utilises hire and contracts to source specialist skills required to meet business requirements. The largest contributors to the hire and contracts expenditure line item are water monitoring (see section 6.6.3.1), catchment management (see section 6.6.6), and maintenance (see section 6.5.5):

- hydrometric services and laboratory services ($9.1 million per annum on average) – expenditure on water monitoring such as field services and laboratory analytical services (see Section 6.6.3.1 on water monitoring), maintenance of the hydrometric network (see Section 6.5.5 on maintenance), as well as minor expenditure on catchment management and protection activities such as pathogen monitoring and the science program (see Section 6.6.6 on catchment management)
- fire response and land management ($6.1 million per annum on average) – primarily refers to expenditure on firefighting activities, pest and weed control and other lands management activities as part of the catchment management function (see Section 6.6.6)

[34] Refer to https://arp.nsw.gov.au/sites/default/files/TC14-18_NSW_Public_Sector_Wages_Policy_2011.pdf

- catchment land remediation ($1.5 million per annum on average) – primarily refers to outsourced activities as part of the catchment management function (see Section 6.6.6), particularly delivery contracts to carry out WaterNSW's Grazing and Erosion Program and specialist skills required to implement WaterNSW's dairy program

- other professional services ($1.3 million per annum on average) – includes expenditure on environmental services (land contamination costs see section 6.6.2 on environmental planning and protection) and water modelling advice (see section 6.6.3.2 on water monitoring and analysis)

- engineering services ($1.2 million per annum on average) – expenditure on Portfolio Risk assessment follow up studies, dam safety incident planning, training and preparation (see Section 6.6.1 on dam safety) and minor expenditure on maintenance related activities (see Section 6.5.5 on maintenance)

- maintenance of infrastructure assets ($5.9 million per annum on average) – see Section 6.5.5 on maintenance expenditure

- ground maintenance ($1.5 million per annum on average) – primarily refers to expenditure on recreational lands management as part of the catchment management function (see Section 6.6.6 on catchment management and section 6.6.7 on recreational management).

6.7.3 Administration

The administration category includes staff costs, travel, hospitality, office, among other minor cost categories.

6.7.4 Property

The property category includes subcategories of property maintenance, property cleaning, other energy costs and general utilities, rental expenses and property security expenses.

There are various movements in the property cost category, including a reduction in rent expenses partly attributed to splitting out the lessor recharge (outgoings) for the rental expenses, and an increase in security expenses.

6.7.5 Land tax cost

WaterNSW has included in its proposed operating expenditure approximately $1.9 million per year in provision for land tax liabilities which arise from owning land in the Greater Sydney region as part of our regulated functions.

WaterNSW understands that the former SCA, as a Government Department, was not subject to land tax and hence the current determination allowances would not have catered for potential land tax liabilities. In contrast, WaterNSW, as a State Owned Corporation, is subject to land tax liabilities as an owner of land in the Greater Sydney Region.

WaterNSW has lodged a registration application with Revenue NSW for land tax. We are forecasting a land tax liability of $1.9 million per annum over the 2020-24 Determination period.

6.7.6 Fish River bulk water costs

WaterNSW has included in its expenditure profile the cost of purchasing bulk water transfers of $2.1 million per annum from the Fish River Water Supply Scheme (FRWS) into the Blue Mountains systems[35] as a water balancing measure to provide bulk water to Greater Sydney and Sydney Water.

The purpose of the FRWS is to provide raw and filtered water to Oberon and Lithgow Councils, EnergyAustralia, WaterNSW and approximately 311 smaller customers. The FRWS includes water which is supplied from Oberon Dam, Rydal Dam and Duckmaloi Weir. WaterNSW is able to access water from Oberon Dam and Duckmaloi Weir.

A detailed discussion on the Fish River bulk water costs is provided as Appendix F 'Fish River Bulk Water Costs and WAMC Licensing Costs'.

6.7.7 WAMC licensing costs

Using the charges in the current WAMC Determination, WaterNSW has included in its proposed expenditure profile approximately $3.6 million per annum ($2019-20) in potential licensing costs over the upcoming 2020-24 Determination period for illustrative purposes only.

As there is uncertainty around the potential cost base for future WAMC charges, WaterNSW submits that it would be prudent for IPART to permit a pass through of actual WAMC licensing costs, instead of a fixed cost allowance, for the upcoming 2020-24 Determination period.

Our approach to WAMC licensing costs for the Greater Sydney determination is outlined in Appendix F 'Fish River Bulk Water Costs and WAMC Licensing Costs'.

[35] The Blue Mountains Raw Water Supply consists of 5 small storages located in the Upper Blue Mountains and the Fish River Pipeline to the Fish River Water Supply Scheme (FRWS).

7 Regulatory asset base

We are proposing to calculate the value of the regulatory asset base using IPART's standard methodology. The opening value of the Greater Sydney RAB for 2020/21 is $1,820 million. The proposed closing value of the RAB for 30 June 2024 regulatory is $2,356 million.

7.1 Introduction

The regulatory asset base reflects the written-down value of efficient capital expenditure that WaterNSW has incurred to provide bulk water services to customers in Greater Sydney. The RAB provides the basis for calculating both the return on capital and the return of capital (i.e. depreciation), two of the key building blocks that comprise WaterNSW's total revenue requirement.

There are two steps involved in calculating the RAB:

- first, determining the opening RAB for the 2020-24 Determination period, commencing 1 July 2020
- second, determining the value of the RAB for each year of the 2020-24 Determination period from 2020-21 to 2023-24.

This chapter sets out WaterNSW's approach to implementing each step and to calculating the RAB for the 2020-24 Determination period.

7.2 Proposed approach

WaterNSW has adopted IPART's standard regulatory approach to establishing the opening RAB for 2020-21, which is consistent with IPART's methodology from the current regulatory period, in which IPART rolled forward one RAB representing the regulatory value of all asset used to provide bulk water services to Greater Sydney bulk water customers, irrespective of the geographical location of our assets or customers within the Greater Sydney system.

This involves a roll-forward calculation of the RAB from the 2016-20 Determination. Given that the actual results for 2015-16 were not known at the time of the last IPART determination, adjustments are required to this opening value for differences in capital expenditure, disposals, forecast depreciation and actual indexation.

This calculation is then repeated for each year of the current regulatory period (using forecasts for 2018-19 and 2019-20) to arrive at a forecast closing RAB value for 2019-20, which then becomes the opening RAB value for the 2020-24 Determination period starting on 1 July 2020. While actual values are used for net capital expenditure and asset disposals, depreciation is based on forecast capital expenditure from the previous regulatory period. This is consistent with the approach used by IPART in the 2016-20 Determination and in other recent IPART decisions.

Each of the inputs required to implement the roll-forward calculation is discussed separately below.

7.3 Calculating the opening regulatory asset base

7.3.1 Actual efficient net capital expenditure

Actual and forecast efficient net capital expenditure over the current regulatory period is set out in Table 7.1 below. Chapter 5 'Capital expenditure' provides details of the capital expenditure program, including explanations for the deviations from the efficient capital expenditure that was approved for the current regulatory period. 'Net capital expenditure' refers to total capital expenditure less capital contributions.

7.3.2 Asset disposals

For non-significant asset sales, IPART's Asset Disposals Policy Paper 2018[36] states that the sale value net of efficient sales costs of non-significant assets will be removed from the RAB.

The total sale value net of efficient sales costs of non-significant asset sales for 2018-19 and 2019-20 were forecast as an average of that from 2015-16 to 2017-18, adjusted for inflation using rates in the IPART SIP letter[37].

There were no significant asset disposals from 2015-16 to 2017-18, and we assume that no significant asset disposals will occur in 2018-19 and 2019-20.

Total asset disposals (comprising only of non-significant assets) are generally lower than what was expected at the beginning of the 2016-20 Determination period, as shown in Table 7.1 below.

Table 7.1 – Asset disposals over the 2016-20 determination period ($millions, $nominal)

	2015-16	2016-17	2017-18	2018-19	2019-20
Actual asset Disposals	1.3	0.2	0.2	0.5	0.5
Expected Disposals	1.2	1.2	1.4	1.5	1.5

*These asset disposals consist of non-significant assets (those with book value less than 0.5% of the opening value of the RAB in the year which the asset is disposed)

7.3.3 Depreciation

Depreciation is the allowed amounts from IPART's 2016-20 Determination as shown in Table 7.2.

7.3.4 Indexation of the Regulatory Asset Base

Consistent with standard regulatory practice, the RAB is indexed to ensure the real value of the RAB is maintained over time. We have used IPART's methodology for measuring actual inflation.

Given the timing of the regulatory proposal on 1 July 2019, the 2018-19 Consumer Price Index (CPI) calculation holds the March 2019 CPI constant for June 2019. This will be updated following the release of the June 2019 CPI figures. For 2019-20, the forecast change in the CPI is set equal to forecast CPI for the 2020-24 Determination period. The RAB roll-forward in the

[36] https://www.ipart.nsw.gov.au/files/sharedassets/website/shared-files/pricing-reviews-water-services-metro-water-asset-disposals-policy-2017/legislative-requirements-asset-disposals-policy-2017/final-report-asset-disposals-policy-paper-for-application-to-water-businesses-19-february-2018.pdf

[37] IPART's review of WaterNSW Greater Sydney prices from 1 July 2020 – Submission Information Package. Letter from IPART to WaterNSW on 10 December 2018. Page 6.

next regulatory period will account for the difference between forecast and actual inflation for 2019–20.

7.3.5 Proposed opening Regulatory Asset Base

The roll-forward of the RAB is shown below in Table 7.2. The forecast closing RAB for 2019-20 is **$1,820 million**. This amount becomes the opening RAB for the upcoming regulatory period commencing in 2020-21.

The closing RAB in each year is calculated as the RAB in the beginning of the year, plus capital expenditure (net of cash capital contributions), minus asset disposals and depreciation. The RAB is indexed to inflation (June to June CPI, using rates advised by IPART in its SIP letter)[38], including indexation on the opening value of the RAB, 50% of the value of capital expenditure (net of cash capital contributions) and 50% of the value of asset disposals (indexation on disposals is subtracted from other indexation additions).

The 50% value reflects the assumption that half of expenditure and asset disposals are incurred at the beginning of the year (which should be indexed) and half of these are incurred at the end of the year (which should not be indexed). IPART's approach to the timing of cash flows is discussed further in Section 9.1 'Working Capital'.

Table 7.2 below calculates the opening RAB for 2020-21 by rolling forward the RAB from 2015-16.

Table 7.2 – Opening RAB at 2020-21 ($millions, $nominal)

	2015-16	2016-17	2017-18	2018-19	2019-20
Opening RAB	1,471	1,476	1,507	1,552	1,643
Plus: Capital expenditure (net of cap cons)	18	28	41	85	166
Less: Asset Disposals	1	0	0	0	0
Less: Regulatory depreciation	27	26	27	29	31
Plus: Indexation	15	28	32	35	43
Closing RAB	**1,476**	**1,507**	**1,552**	**1,643**	**1,820**

Source: WaterNSW analysis

As outlined above, the closing RAB for the current determination period of $1,820 million becomes the opening RAB for the 2020-24 Determination period.

7.4 Regulatory Asset Base for 2020-24

The RAB for each year of the 2020-24 Determination period is calculated in the same manner, with the starting point for the RAB calculation being the closing RAB from the roll-forward calculation as set out above. The opening RAB is then adjusted for forecast capital expenditure, forecast asset disposals and forecast depreciation.

The calculation is repeated for each year of the upcoming regulatory period.

7.4.1 Forecast efficient capital expenditure

Forecast efficient capital expenditure is set out in Chapter 5 'Capital Expenditure'.

[38] Letter from IPART to WaterNSW December 2018.

7.4.2 Forecast disposals

Water NSW is forecasting disposals of approximately $481,000 per annum based on the application of IPART's standard methodology applied to an assessment of historic costs.

WaterNSW has forecast no significant asset disposals over the upcoming determination period and has forecast non-significant[39] asset disposals based on a historical average from 2015-16 onwards.

Under the IPART disposals rules, the regulatory value of assets which are sold or disposed of are deducted from the RAB to ensure that customers only contribute to the cost of asset which are used to provide monopoly services to the customer.

However, IPART's policy on asset disposals states that if an asset was demonstrably non-operational at the 'line-in-the-sand' (i.e. 2000) then, on an exception basis, IPART would not deduct its sale from the RAB.[40]

Over the upcoming determination period, WaterNSW intends to identify and potentially dispose of land parcels which are considered in excess of WaterNSW's operational requirements in the Greater Sydney area. At this early stage, WaterNSW has identified land parcels at Braidwood as being potentially in excess of WaterNSW's operational requirements.

WaterNSW understands that the Braidwood land parcel consists of approximately 28,050 hectares,[41] which were originally acquired by the then Sydney Water Board between 1968 and the 1980s with the intention of building the "Welcome Reef Dam" as part of Stage 2 of the Shoalhaven Scheme. SCA assumed responsibility for the Braidwood land parcels in 1999 when Sydney's bulk water assets were split from the SWC.

In the early 2000s, it is understood that the NSW Government announced that the Welcome Reef Dam was permanently deferred. In 2004, the NSW Government announced through its 2004 Metropolitan Water Plan that the construction of the Welcome Reef Dam was not necessary, adding that the Welcome Reef Dam would be *very shallow with a large surface area, meaning that evaporation rates would be extremely high and increase the potential for toxic blue-green algae outbreaks*.[42]

WaterNSW submits that its Braidwood land parcels were clearly non-operational as at the line of the sand as the Welcome Reef Dam was not constructed or operational by 2000. Furthermore, WaterNSW has leased most of its land parcels to the public primarily for agricultural purposes.[43]

We note that a similar issue was considered by IPART in its 2016 Sydney Water Determination in which IPART decided that Sydney Water was not required to share the proceeds of the sale of its Central Workshops site with customers, as the site was non-operational in 2000.[44]

WaterNSW proposes that its RAB should not be adjusted for the proceeds of any future sale of the Braidwood land parcels.

[39] Non-significant assets are those with value less than or equal to 0.5% of the RAB (in the year which the asset was disposed), consistent with IPART's 2018 asset disposal policy.
[40] IPART *Review of prices or Sydney Water Corporation* from 1 July 2016 to 30 June 2020 Final Report June 2016. Page 119.
[41] https://www.parliament.nsw.gov.au/la/papers/Pages/qanda-tracking-details.aspx?pk=185305119.
[42] Page 8 http://ncc.gov.au/images/uploads/DEWASSSu-040.pdf
[43] Ibid
[44] IPART *Review of prices or Sydney Water Corporation* from 1 July 2016 to 30 June 2020 Final Report June 2016. Page 119.

7.4.3 Forecast depreciation

WaterNSW has adopted the following approach to forecasting depreciation, consistent with IPART's standard methodology:

- a weighted average asset life for existing assets
- a weighted average asset life for new capital expenditure based on a mapping from capital expenditure to asset class (at the project level), and a mapping from asset class to asset life. See the following sections on asset lives below for details.

Forecast depreciation for existing and new assets is calculated using the IPART straight-line methodology adopted for the current determination. The straight-line depreciation method allows for an equal proportion of the asset's value to be recovered in each year of its useful life. This approach is simple, transparent and consistent with regulatory practice used by other Australian regulators.

IPART's standard approach to depreciation results in the opening RAB as of 1 July 2020 (or the 'existing assets') being depreciated over an assumption of the remaining life of the assets before any new capital expenditures are added during the regulatory period. New capital expenditure is depreciated using a weighted average of the standard lives for the 2020-24 Determination period.

7.4.3.1 Existing asset lives

As per IPART's methodology, the average remaining life of assets as at the end of 2019-20 (or beginning of 2020-21) is calculated using an initial average remaining life of existing assets of 60 years as at the beginning of 2015-16. An initial assumption of 60 years is consistent with IPART's 2016 decision on asset lives[45].

We consider that an average remaining life of assets of **60 years** remains appropriate as a proxy for the value-weighted average of the remaining lives of assets obtained prior to the start of the 2020-24 Determination period. Other calculations have been examined, such as a weighted average of the assets obtained prior to 2016-20 Determination year plus a weighted average of the lives of assets obtained at the end of year, which results in an average remaining life for remaining assets of 55.7 years at the beginning of 2020-21.

However, maintaining a 60 year asset life for existing assets is consistent with the weighted average of the standard lives associated with our proposed capital program (as discussed in the following section) which is reasonably reflective of the overall composition of our assets. Shortening the asset lives by rolling forward the 60 year remaining life from 2015-16 to 55 years would not more accurately reflect the composition of our assets and would place upward pressure on customer prices, neither of which are supported.

7.4.3.2 New asset lives

Standard asset lives are used in the calculation of depreciation relating to capital expenditure in the roll-forward value of the RAB for the 2020-24 Determination period.

WaterNSW has categorised its proposed capital expenditure into asset classes and associated asset lives by mapping each project incurring capital expenditure to the asset class it is most related to. Based on this categorisation and pooling expenditure over the 2020-24 Determination period, the weighted average standard asset life associated with new capital expenditure is **61.2 years**.

[45] IPART's "Review of prices for WaterNSW from 1 July 2016 to 30 June 2020 – Final Report" page 48

Table 7.3 below shows the capital expenditure in the upcoming determination period by asset class and year. Capital expenditure in 2021-22 and 2022-23 includes significant expenditure on assets with a long asset life, including $92 million of expenditure on dams (100 year standard life) and $218 million of expenditure on pipelines (80 year standard life) over the determination period.

Table 7.3 – Capital expenditure by asset class (years) and asset life ($000s, $2019-20)

Asset Class	Asset life (years)	2020-21	2021-22	2022-23	2023-24	Total
Dams	100	17,096	48,049	43,587	25,805	134,536.08
Other Storages	80	2,022	0	0	0	2,022.49
Meters	15	1,248	1,256	1,256	1,266	5,026.55
ICT systems	6	12,280	8,744	7,808	8,796	37,628.13
Vehicles	5	1,465	596	596	600	3,256.88
Buildings	40	6,886	2,288	1,514	1,520	12,207.91
Plant & machinery	12	1,398	1,087	1,698	618	4,800.76
Pipelines	80	27,785	103,882	114,027	14,389	260,083.67
Major Mechanical	30	7,575	7,485	2,495	0	17,554.95
Systems/ Controls	10	4,365	2,472	1,558	1,725	10,119.38
Roads/ Minor Civil	30	46,026	40,850	42,064	46,340	175,280.60
5 yearly Inspections	5	292	156	299	430	1,177.61
Major facilities	30	18,716	0	0	0	18,716.03
Total	**-**	**147,154.68**	**216,864.78**	**216,902.73**	**101,488.84**	**682,411.03**

Source: WaterNSW analysis

Due to high capital expenditure on long lived assets, particularly in the middle two years of the determination period, the average asset life of new assets (if calculated per year) is higher in 2021-22 and 2022-23 (68-69 years) than in 2020-21 and 2023-24 (45 and 55 years respectively), as illustrated in Table 7.4.

Table 7.4 – Average asset life of new assets (years)

	2020-21	2021-22	2022-23	2023-24	Weighted Avg
Average asset life of new assets	45.54	68.11	69.08	52.07	**61.16**

Source: WaterNSW analysis

WaterNSW proposes using the weighted average of **60 years** to depreciate our proposed capital expenditure program over the 2020-24 Determination period as this is reasonably reflects our detailed weighted average calculation of 61.2 years, while at the same time not suggesting an unreasonable level of precision.

7.4.3.3 Cash capital contributions

WaterNSW has received no cash capital contributions over the 2016-20 Determination period and is not forecasting any cash contributions over the 2020-24 Determination period.

7.4.4 Our proposed RAB for 2020-24

The RAB for each year of the 2020-24 Determination period can be calculated using the input values discussed above. The resulting combined business RAB values are presented in Table 7.5 below.

Table 7.5 – RAB roll-forward ($millions, $2019-20)

	2020-21	2021-22	2022-23	2023-24
Opening RAB	1,820	1,935	2,117	2,295
Plus: Capital expenditure (net of cap cons)	147	217	217	101
Less: Asset Disposals	0	0	0	0
Less: Regulatory depreciation	32	35	38	41
Closing RAB	**1,935**	**2,117**	**2,295**	**2,356**

Source: WaterNSW analysis

Table 7.5 above calculates the value of the RAB throughout the 2020-24 Determination period. The closing RAB at the end of the 2020-24 Determination period is **$2,356 million**.

8 Rate of return on capital

Our proposed rate of return for the 2020-24 Determination period is 4.1% for each year during the period based on IPART's post-tax real framework, with annual updates to the cost of debt.

8.1 Proposed method and rate of return

The return on capital covers the cost of servicing our debt and provides a return to our shareholders for their equity investment in our business. It is calculated by multiplying the value of our regulated asset base by the rate of return on capital. WaterNSW is proposing to apply the Weighted Average Cost of Capital (WACC) methodology for determining the rate of return on capital.

The WACC is the minimum ('benchmark') financial return an investor requires from an investment given its risk before committing additional capital. It is the sum of weighted average returns expected from the two types of capital invested – debt and equity.

In determining the appropriate rate of return, economic regulators, including IPART, strive to provide an allowance as reasonably accurate as possible to ensure that customers do not pay more than necessary and that the regulated firms will be financially viable and have the incentive to invest in the efficient level of productive assets.

8.2 Why is it important?

The return on capital makes up approximately 40 per cent of the revenue allowance that we need to provide bulk water supply services in the Greater Sydney region.

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

8.3 IPART's method for determining the appropriate WACC

We have estimated the rate of return by applying IPART's method for estimating and determining the WACC as published in the IPART Final WACC Report in 2018 (the 2018 WACC Methodology)[46]. We propose that IPART adopts this methodology in its 2020-24 Determination for Greater Sydney.

IPART's 2018 WACC Methodology is based on a 'post-tax real' framework. The methodology includes sector-wide parameters and applies financial market information as published by IPART in its Bi-annual WACC Update from 15 February 2019[47]. The methodology requires annual updates to the cost of debt during the regulatory period using updated market information. Whether the revenue impact of the annual cost of debt updates is addressed at each annual price change or held and adjusted at the subsequent determination is a separate decision point that is addressed in Section 8.5.2 below.

[46] See *IPART Review of our WACC method – Final Report 20018*. https://www.ipart.nsw.gov.au/files/sharedassets/website/shared-files/investigation-administrative-legislative-requirements-sea-wacc-methodology-2017/final-report-review-of-our-wacc-method-february-2018.pdf

[47] See https://www.ipart.nsw.gov.au/Home/Industries/Special-Reviews/Regulatory-policy/WACC/Market-Update/Spreadsheet-WACC-model-February-2019

We consider that IPART's methodology, as described below, is a reasonable proxy for our benchmark cost of capital and is in the best interests of customers for the 2020-24 Determination. We will review IPART's application of its methodology during this determination, noting that we may suggest enhancements to IPART's WACC methodology for future reviews.

IPART's methodology to calculate the real post-tax WACC is as follows:

Equation 1

$$WACC = \left\{\frac{\left[1 + \left(Kd\frac{D}{V} + Ke\frac{E}{V}\right)\right]}{1 + i}\right\} - 1$$

where,

Kd = nominal cost of debt
Ke = nominal cost of equity
D = value of debt capital
E = value of equity capital
V = value of firm = D + E
D/V = leverage
i = expected inflation

and where the nominal cost of debt, Kd, is estimated based on:

$$Kd = R_f + DRP + IC$$

where
Rf = Risk-free rate
DRP= debt risk premium
IC = debt issuance/raising costs
DRP+IC = debt margin.

and where the nominal cost of equity, Ke, is estimated based on:

$$Ke = R_f + MRP\ x\ \beta$$

where
Rf = Risk-free rate
MRP= market risk premium
β = equity beta

Step 1 of the 2018 WACC Methodology is to estimate the WACC based on an equal weighting of short-term and long-term WACC calculations to first establish a WACC range. Step 2 consists of IPART selecting the mid-point of the range as its post-tax real WACC for the determination.

As a final check, IPART subjects its mid-point post-tax real WACC to its 'uncertainty index' to assess whether the mid-point average is reasonable given current market conditions or whether further adjustment is warranted. IPART's uncertainty index is a statistical assessment of market movements whereby one standard deviation is applied as the proxy for risk. If the mid-point WACC calculation is within the one standard deviation band, no further adjustment is required. If it is outside the range, IPART suggests further adjustments to the mid-point WACC may be required.

8.4 Benchmark efficient entity and selection of proxy firms

Starting in 2013, IPART estimated the WACC with reference to an efficient benchmark entity, which IPART defined as 'a firm operating in a competitive market and facing similar risks to the

regulated business'. The cost of capital for this firm may be different to the regulated business' actual cost. IPART suggests that this is consistent with its price setting objective, which is to attempt to replicate the disciplines of a competitive market. A competitive market would limit prices to the level of efficient and prudent costs. This could differ from the costs incurred by the actual business.

Because the benchmark entity is a hypothetical firm, its cost of capital cannot be observed directly. Therefore, IPART relies on information on a sample of proxy firms to determine the industry-specific WACC parameters. How IPART defines the benchmark efficient entity is important, as it guides its selection of these proxy firms.

IPART notes that it will publish its criteria for proxy selection, and its list of comparator companies that meets its criteria at the start of the price review and will give stakeholders the opportunity to propose additional comparable industries that meet its criteria, but not individual stocks.

Our comments on IPART's selection of comparator firms for calculating the equity beta are provided in Section 8.6.3.1.

8.5 Cost of debt

IPART's 2018 WACC Methodology uses a 10-year trailing average for the long-term observations of the risk free rate and the debt margin. In practice, this will result an annual update whereby the oldest 10% tranche of risk-free and debt margin rates (from 10 years ago) is replaced with a new 10% tranche of recently observed rates (from year 0).

Current observations are also updated on a trailing average basis linked to the length of the regulatory period – in this case, four years. However, for the first year of this methodology, 100 per cent of the current rate will still be observed in the 40-day observation period and will transition to a four-year trailing average by replacing 25 per cent of that rate with recently observed rates each year. A four year current trailing average for will therefore not be fully in place until the regulatory period commencing 1 July 2024.

In IPART's 2018 WACC Methodology, IPART maintains its 2013 method of determining the cost of debt as the midpoint between its estimates of the historic and the current cost of debt, and only considers moving away from this midpoint rule when IPART's uncertainty index indicates market conditions are highly volatile.[48]

On balance, IPART considered a midpoint approach creates the right balance of incentives for efficient investment and for prudent debt management. However, IPART decided to make incremental changes to the way it calculates the historic and the current costs, and to update these costs during the regulatory period. IPART suggests that these changes serve the long-term interests of customers, as they should increase the accuracy of its approach and reduce the refinancing risks that regulated businesses face. The changes were to:[49]

- **Adopt a 10-year trailing average approach to calculate the historic cost of debt.** This is aimed to increase the accuracy and replicability of this calculation, which IPART considered to be only a relatively minor change from its 2013 method

- **Adopt a short-term trailing average approach to calculate the current cost of debt,** where the period of the trailing average equals the length of the regulatory period. This is aimed to allow firms to better manage their refinancing risk, while maintaining their incentives for efficient investment

[48] IPART *Review of our WACC method – Final Report, February 2018.* Page 25.
[49] Ibid. Page 24.

- **Adopt consistent observation windows in calculating the historic and current costs of debt.** Under the trailing average approach, IPART needs to sample the cost of debt annually for both the historic and current cost estimates. To do this, IPART indicates it will use a subset of financial market data over a 40-day observation window each year and give the specific business advance notice of this window. IPART suggests this approach is most consistent with how an efficient benchmark entity would raise and manage debt in a competitive market

- **Update IPART's cost of debt decision during the regulatory period, and decide how changes will flow through to prices on a case-by-case basis, as part of the review process.** IPART will use a trailing average approach to update the cost of debt at the start of each year within the period. Before the start of the period, IPART will decide on a case-by-case basis whether the annual changes in the cost of debt will flow through to prices in the subsequent year, or whether they will be cumulated and passed through via a true-up in the subsequent regulatory period

- Where IPART decides to use a true-up, IPART will **discount changes in the cost of debt by the WACC** to account for the time value of money

- **Annualise bond yield data derived from semi-annual rates of return**, which should increase the accuracy of IPART's method.

8.5.1 Historic cost of debt – 10-year trailing average

Under IPART's 2018 WACC Methodology, IPART will estimate the historic cost of debt at the beginning of each regulatory period and update this cost annually during the period.

To estimate the 10-year trailing average, IPART will split the historic cost of debt into 10 equal tranches, with the commencement and maturity dates for each tranche staggered by one year. At the beginning of each year of the regulatory period, the oldest tranche of debt will mature and a new tranche at the new prevailing interest rate will replace it.

To update the historic cost of debt, IPART will calculate the change in the historic cost of debt each year during the regulatory period by:

- measuring the interest rate of the new tranche of debt and subtracting the interest rate of the maturing tranche of debt

- dividing this number by the total of tranches (i.e. 10).

IPART will estimate the interest rate for each annual tranche of debt using a 40-day observation window that IPART chooses. IPART has indicated that it will give firms advanced notice of this window.[50]

IPART will implement the 10-year trailing average approach at the start of the next (i.e. 2020) regulatory period (i.e. with no transition), when IPART's 2018 method applies.

IPART has indicated it will:

- initially set the historic cost of debt as a 10-year average, with the interest rate for each annual tranche estimated over a consistent 40-day period

[50] Ibid. Page 28.

- update the historic cost of debt from the beginning of the second year of the regulatory period, by averaging the interest rates of each annual tranche of debt

- calculate the change in the historic cost of debt in line with the following equation:

Equation 2

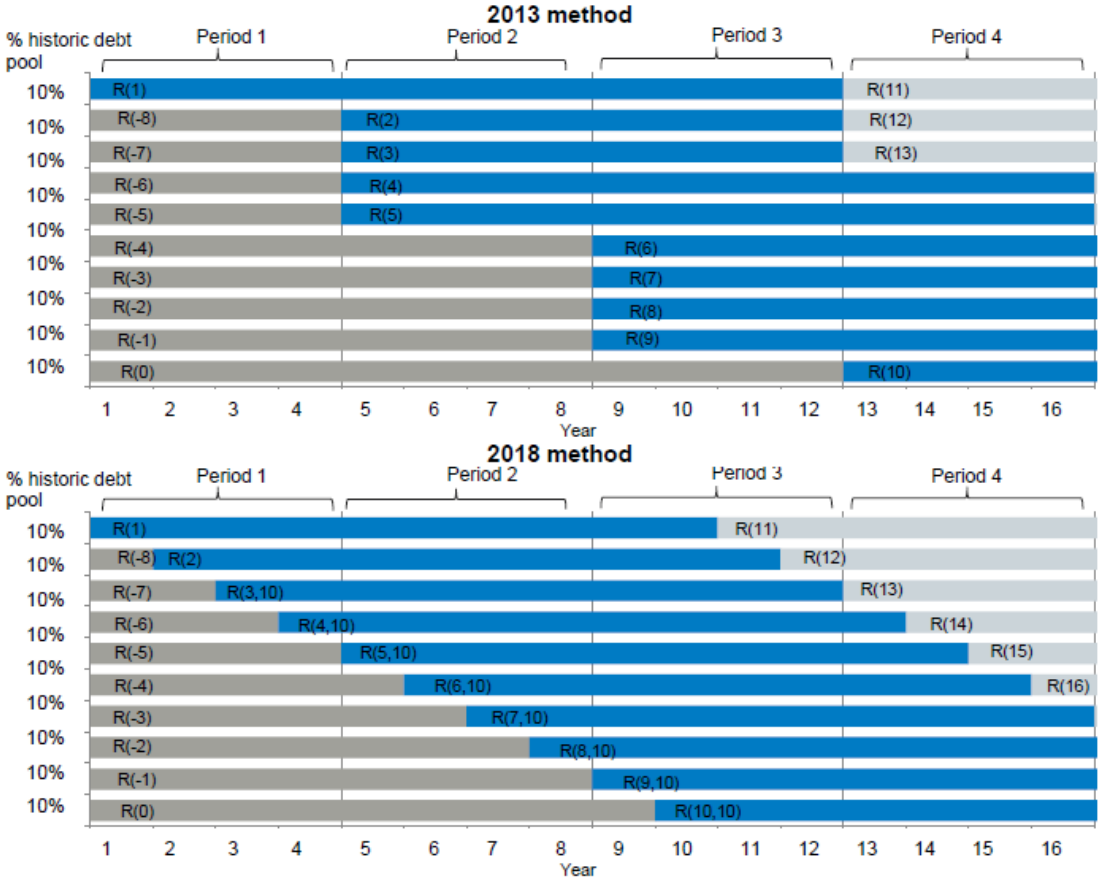
$$(1) \qquad \Delta R_i = \frac{(R_i - R_{i-10})}{10}$$

  - where ΔRi is the change in the cost of debt calculated at the beginning of year i of regulatory period and Ri is the interest rate in year i

  - pass through this change in the 10-year trailing average to prices through either an annual update or a regulatory true-up in the following period.

To illustrate the difference between IPART's 2013 method that underpins the 2016-20 Determination for calculating the historic cost of debt and IPART's new 10-year trailing average approach, Figure 8.1 below compares the interest rate data IPART would use to calculate this cost for a hypothetical firm under each method.

Figure 8.1 – Calculating the historic cost of debt under IPART's 2013 and 2018 methods



Note: R(y) is the interest rate on a bond issued in Year *y*. For example, R(0), is the interest rate for a 10-year bond issued in Year 0.

Source: Figure 4.1 from IPART *Review of our WACC method – Final Report, February 2018.* Page 29.

8.5.1.1 No transition to the new approach for estimating the historic cost of debt

IPART does not think it is necessary to transition to its new approach for estimating the historic cost of debt. Therefore, IPART will implement the 10-year trailing average approach at the start

of the 2020-24 Determination period, when IPART's 2018 WACC Methodology applies, **with no transition**. Under this approach IPART will:

- initially set the historic cost of debt as a 10-year average, with the interest rate for each annual tranche estimated over a consistent 40-day period
- update the historic cost of debt from the beginning of the second year of the regulatory period, by averaging the interest rates of each annual tranche of debt
- calculate the change in the historic cost of debt in line with Equation 1 above
- pass through this change in the 10-year trailing average to prices through either an annual update or a regulatory true-up in the following period.

8.5.1.2 Short term-trailing average approach to estimate the current cost of debt

IPART, under its 2018 WACC Methodology, will estimate the short-term trailing average in a similar way to the 10-year trailing average. IPART will split the current cost of debt into a number of equal tranches. This number will be equal to the years in the regulatory period, and the commencement and maturity dates for each tranche will be staggered by one year. At the start of each year of the regulatory period, the oldest tranche of debt will mature and a new tranche at the new prevailing interest rate will replace it.

Once the short-term trailing average is fully implemented, it will measure the average cost over a period equal in length to the regulatory period. For example, over a 4-year regulatory period, the short-term trailing average will measure the average cost of debt over the previous four years.

To update the current cost of debt, IPART will calculate the change in the current cost of debt each year during the regulatory period by:

- measuring the interest rate of the new tranche of debt, and subtracting the interest rate of the maturing tranche of debt
- dividing this number by the total number of tranches (e.g. four).

IPART will account for any changes to the length of the regulatory period as they arise, usually as part of the review process.

IPART will adopt the same approach to measure the interest rate for each annual tranche of debt for both current and historic estimates (i.e., adopting a consistent 40-day period that IPART chooses).

Once notified by IPART, WaterNSW will provide a confidential submission to IPART on the appropriateness of the averaging period proposed by IPART and on the updated cost of debt inputs for IPART's Final Determination.

8.5.1.3 Transitioning to the short-term trailing average

Unlike the historic cost of debt, IPART's 2013 and 2018 methods for estimating the current cost of debt differ significantly.

IPART's 2013 method measures the cost of debt at a discrete 40 working day window each regulatory period, whereas the 2018 short-term trailing average measures the average cost of debt over a period equal in length to the regulatory period. Given this difference, IPART has

decided to transition to the new method, to "promote stability and to allow stakeholders sufficient time to transition to our new method".[51]

At the beginning of the 2020-24 Determination period when IPART's 2018 WACC Methodology applies, IPART will initially set the current cost of debt as a 40-day average, in line with its 2013 method. At the beginning of the second year, IPART will begin updating the current cost of debt by taking the average across the interest rates in each tranche of debt. IPART will calculate the change in the cost of debt at the beginning of Years 2 to 4 of the period (ΔRi), as outlined in Equation 3 below:

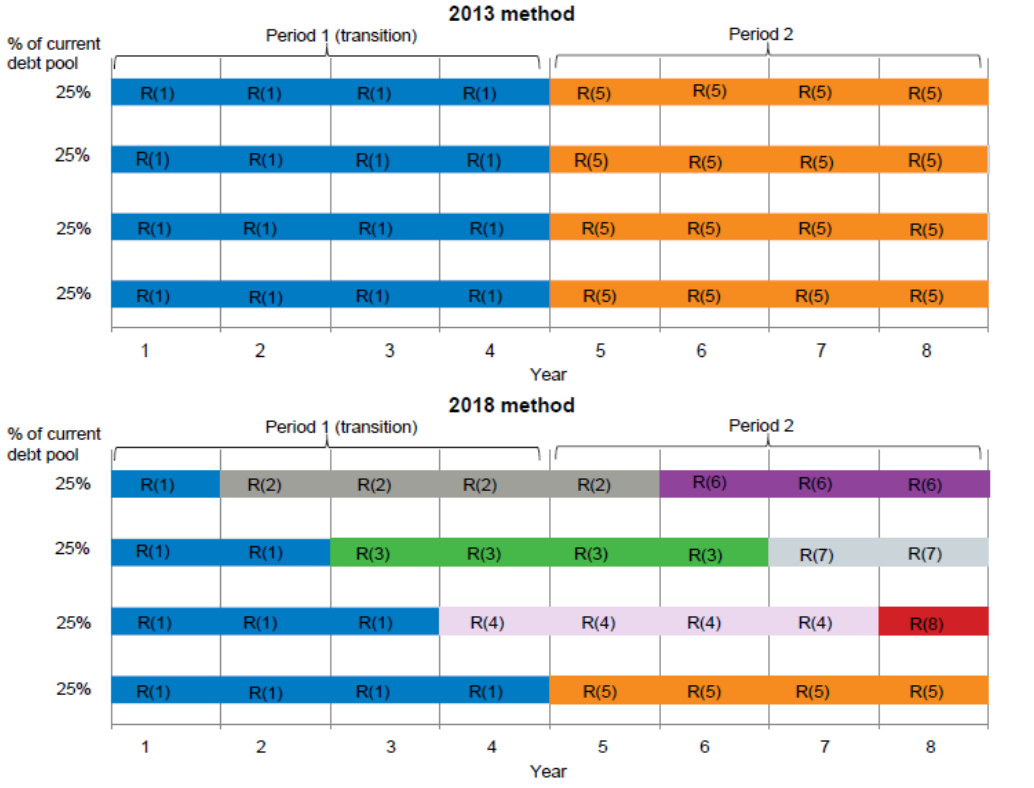
Equation 3

$$\Delta R_i = \frac{(R_i - R_1)}{4}$$

Where R_i is the interest rate in year i=2,3,4.

The effect of the transition is highlighted in Figure 8.2 below.

Figure 8.2 – Calculating the current cost of debt under IPART's 2013 and 2018 methods



Note: R(y) is the interest rate on a bond issued in Year *y*. For example, R(0), is the interest rate for a 10-year bond issued in Year 0.

Source: Figure 4.4 from IPART *Review of our WACC method – Final Report, February 2018*. Page 24.

As illustrated above, under the 2018 method, the current cost of debt is calculated according to the following approach:

- Year 1 is calculated based on 100% of the Year 1 interest rate (R(1))

[51] IPART *Review of our WACC method – Final Report, February 2018*. Page 33.

- Year 2 is calculated based on 75% of the Year 1 interest rate (R(1)) and 25% from the Year 2 interest rate (R(2))
- Year 3 is calculated based on 50% of the Year 1 interest rate (R(1)), 25% from the Year 2 interest rate (R(2)) and 25% from the Year 3 interest rate (R(3))
- Year 4 is calculated based on 25% of the Year 1 interest rate (R(1)), 25% from the Year 2 interest rate (R(2)), 25% from the Year 3 interest rate (R(3)) and 25% from the Year 4 interest rate (R(4)).

By the end of Year 4, the transition is complete, and each year represents 25% of the current cost of debt. For subsequent regulatory periods (i.e. Period 2 in Figure 8.2) the short-term trailing average operates as discussed above.

8.5.2 How to pass through annual changes

Under IPART's new trailing average approach for estimating the historic and current costs of debt, IPART needs to update its decision on the cost of debt each year.[52]

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

> *4.6.2 We will decide between annual price changes or true-up as part of our determination*
>
> *We can see merit in both points of view. The different perspectives reflect the different circumstances of each organisation. For this reason, we have decided not to impose a uniform rule on all regulated firms. Instead, we will decide whether to apply annual price adjustments or the true-up on a case-by-case basis, as part of our review process. In reaching this decision, we will consider any submissions from the regulated business, its customers and other relevant stakeholders. Neither option would be considered the default.*
>
> *Final Decision*
>
> *10 Update the regulatory cost of debt annually, and decide whether to pass through changes via annual price adjustments or a true-up in the subsequent period:*
>
> - *as part of the price determination,*
> - *and on a firm-by-firm basis.*[53]

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

Therefore, IPART will decide whether to apply annual price adjustments or a true-up on a case-by-case basis, as part of its review process. In making this decision, IPART will have regard to any evidence the regulated firm or its customers put forward to support one approach or the other, with neither option a default.

WaterNSW requests that IPART allow **annual updates** for the 2020-24 Determination, on the following basis:

- **Customer interests** – Annual updates provide smaller, incremental price changes to customers and reduce price-shocks at regulatory reset dates. Not allowing adjustments

[52] IPART *Review of our WACC method – Final Report, February 2018.* Page 38.
[53] Ibid. Page 39.

within a regulatory period can lead to significant price movements in a subsequent regulatory period.

Applying annual updates to reflect changes in the cost debt is more likely to mitigate against price shocks for customers, as the alternative approach of aggregating the annual changes and applying the balance at the subsequent reset may institutionalise greater price volatility at the commencement of each regulatory period (particularly if interest rates move in the same direction in each year).

WaterNSW is particularly concerned about this risk given that water bills can have a material and direct impact to the end user.

- **Cashflow timing impacts** – Without annual updates, the cashflow impact of differences between the cost-of-debt allowance and actual interest costs are borne by the firm – and may impact on cashflow coverage ratios and credit ratings – particularly at higher leverage, where a firm is close to debt covenants or has weak credit rating outlook.

  This may impact the financeability of the firm, particularly if the firm needs to raise additional debt to fund capital or operating expenditure not factored into the determination allowances and caused by unforeseen circumstances.

- **Incentive to incur efficient debt raising costs** – A desirable feature of a regulatory framework is to provide a return on debt that aligns to the debt management practices of an efficient benchmark firm.

  This includes the firm having the ability to manage its interest rate risk with various debt instruments (including swaps and hedges). Annual adjustments to reflect the annual cost of debt would provide better matching of the annual debt costs and the regulatory allowances, which would assist the debt management process.

- **Administratively simple** – Annual updates are a core feature of most well-functioning regulatory frameworks and determinations, including the 2020-24 Determination, where the application of inflation plus other price adjustments is commonplace. A mechanical adjustment to prices each year to reflect the updated cost of debt would be a straightforward and administratively simple addition to the annual price setting process.

We note that IPART in its draft report for the Murray River to Broken Hill pipeline determination did not accept WaterNSW's proposal for annual updates and instead recommended a true-up as noted below:

> *Our draft decision is that annual changes in the cost of debt should be cumulated and passed through via a regulatory true-up in the subsequent regulatory period (ie, the 2022 Determination). While the two options are equivalent in present value terms to customers and WaterNSW, we favour the regulatory true-up because it provides greater certainty to customers about their prices over the determination period – changes in prices would be impacted by inflation only, rather than also being impacted by annual changes in the cost of debt.*
>
> *Further, provided that the true-up is smoothed over the 2022 determination period, we do not expect that price shocks would be any more likely in the next determination period under our draft decision, compared to an annual update.*[54]

[54] IPART Draft Report for the Murray River to Broken Hill pipeline, April 2019. Page 58.

While there is an argument to suggest that price volatility is not minimised by building in adjustments to prices each year of the determination for changes in the annual cost of debt, we consider that annual changes are superior to a true-up based on the following:

- earlier debt tranches will necessarily roll off the historic trailing average calculation for the cost of debt each year of the 2020-24 Determination period, noting that earlier tranches had contained costs of debt higher than prevailing rates. *A priori*, this would reduce the cost of debt over the upcoming regulatory based on a lower historic trailing average cost of debt unless the prevailing rate for new debt tranches is prevailing rates occur at an equally high rate. Given the current low-interest rate environment, the probability of this occurring appears low. In these circumstances, and under a 'true-up', there would be a delay in the time in which customers would benefit from the lower cost of debt through lower prices associated with cost of debt decreases

- if the annual costs are not 'random' and do not offset during the regulatory period (the basis on which the 'true up' at the end of the period may be preferable), then the risk of a large inter-determination adjustment is higher with a 'true-up' at the next determination than with annual price adjustments. This provides further support to the view that annual adjustments are preferable to a 'true-up' in managing pricing volatility for customers (recognising that annual prices would change in any case due to the application of CPI and any other adjustments provided for the in the determination

- annual changes to prices already occur for changes due to inflation, the pricing arrangements for SDP and the cost pass through for Shoalhaven transfers. Updating prices for annual changes in the cost of debt would be administratively simple and, as outlined above, provide greater protection against larger price shocks that may occur under a true-up.

8.6 Cost of equity

In its 2018 WACC Methodology, IPART stated that it will to continue to use the Sharpe-Lintner Capital Asset Pricing Model (SLCAPM) as the foundation model to determine the current and long-term cost of equity SLCAPM, as there is not a sufficient case to replace it with an alternative model. However, IPART has indicated it will monitor the impact that moving to the Fama-French model would have on WACC decisions over the next five years.

Implicit in the SLCAPM is that only systematic risk affects the expected return required by the marginal equity investor. This is because the marginal investor would hold a diversified portfolio of equities, and a diversification strategy can remove firm-specific risk.

The average cost of equity across the entire market comprises a risk-free rate (representing the rate an investor would receive for zero risk to their capital) plus a premium that reflects the additional systematic risk a marginal equity investor bears (representing the average premium the investor would be willing to accept for a less-than-certain return). This is premium is known as the market risk premium (MRP).

Under its 2018 methodology, IPART will continue to determine the cost of equity as the midpoint between its estimates of the current and historic cost of equity at the start of the regulatory period, and to not update this cost during the regulatory period.

IPART has also modified its approach and measures for estimating the equity beta. IPART will continue to **re-estimate the equity beta value at each price review** in order to engage effectively and transparently with all interested parties. However, as discussed below, IPART has indicated it will only change the value its uses in its WACC calculations where it considers there is sufficient evidence to support this.

WaterNSW proposes an estimated cost of equity of **8.1 per cent** for the 2020-24 Determination period. This has been calculated using current (40 days) and long-term (10 year) observations of:

- the risk-free rate – 10-year Australian Government bond yields
- the market risk premium (MRP) – expected return above the risk-free rate for an investor to invest in a well-diversified portfolio of risky assets. The premium is adjusted by IPART to account for imputation credit benefits.

The SLCAPM is the foundation model used by IPART to determine the current and long-term cost of equity, using the following formula:

Cost of equity = risk-free rate + equity beta x market risk premium.

The mid-point between the current and long-term calculations is then selected, unless there are market extremes occurring (as per IPART's Uncertainty Index) which means that IPART may consider moving away from the mid-point.

The SLCAPM requires the use of an 'equity beta', which measures the sensitivity of a business's return compared to upturns and downturns in overall market returns. A beta below one indicates less sensitivity to market movements. More specifically, the SLCAPM is applied using econometrically estimated equity betas combined with the risk free rate (or more accurately, the required return on a zero beta portfolio) being proxied by yields on nominal government bonds.

8.6.1 Gearing

IPART typically adopts a mid-point gearing level (debt to debt-plus-equity ratio) of 60% for regulated water businesses. WaterNSW considers that the assumptions underpinning the gearing level from the 2016-20 Determination remain appropriate and a gearing level of **60%** should be maintained for the 2020-24 Determination.

8.6.2 Value of imputation credits

The observed equity returns that IPART uses to estimate the market risk premium are taken after corporate tax. However, the observed equity returns do not take account of the franking credit benefits that Australian investors receive. To take account of this benefit, IPART's current MRP estimates make an implicit adjustment for dividend imputation. This adjustment assumes a value of imputation credits (gamma) of 0.25, in line with IPART's standard WACC method.

The value of imputation credits effectively reduces projected revenues, so they more closely reflect the impact of franking credit benefits that Australian investors receive. The higher the value of imputation credits (ranging from 0 to 1, or 0 per cent to 100 per cent) in a determination, the lower the revenues the business can expect to receive in compensation for paying corporate income tax.

Gamma is directly applied by IPART in its post-tax framework by reducing the corporate tax allowance for the impact of the imputation credits (see Section 9.2 'Corporate income tax' for further detail).

IPART's 2018 WACC Methodology specified the **value of gamma as 0.25** and this has been used by WaterNSW in determining the revenues and prices contained in this pricing proposal.

8.6.3 Equity beta

The equity beta is a tool for calculating the sensitivity of a firm's stock price to that of the market as a whole.

IPART currently uses the SLCAPM to calculate the cost of equity. According to this model, only systematic risk affects the expected return required by the marginal equity investor. This is because the marginal investor would hold a well-diversified portfolio of equities, and a diversification strategy can remove firm-specific risk.

Equity is generally measured as the covariance between a firm's share price and that that of the market:

- an equity beta of one implies that the firm's stock is the same as for the market as a whole at each point in time. This, simplistically, suggests the firm has a similar risk profile to the market as a whole
- an equity beta below one implies that the firm's rate of return is less sensitive to upturns and downturns than the market overall
- an equity beta above one implies that the firm's rate of return is more sensitive to upturns and downturns than the market overall.

IPART's determined equity beta for the water industry applied in the 2016-20 Determination is 0.7.

In calculating the equity beta, IPART has stated it will:

- continue to use the SLCAPM as its foundation model
- use the broadest possible selection, but exclude thinly traded stocks to improve its selection of proxy companies
- amend its proxy selection process to make it more transparent, predictable and replicable for stakeholders
- continue to use the Vasicek adjustment, but no longer use the Blume adjustment to refine its approach to mitigating estimation bias in raw Ordinary Least Squares (OLS) beta estimates.

We support these improvements from IPART's 2013 method.

However, we note that while the SLCAPM provides a basis for calculating the return on equity for the Greater Sydney review, it is not without its shortcomings. In particular, the SLCAPM suffers from a well-established 'low beta bias', which tends to underestimate the cost of equity for firms with a low beta (i.e. less than 1). Other models could be used as a cross check to ensure the reasonableness of other approaches to the return on equity, including the following:

- the **Wright** approach to populating the SLCAPM, using a long-term average of the observed real return on the market (as a proxy for the forward looking required real return on the market) combined with a current forecast of inflation to estimate the required MRP[55]
- the **Black CAPM**, which retains the use of econometrically estimated equity betas but accounts for low beta bias by directly estimating the required return on a zero beta portfolio

[55] Refer CEG WACC Estimates – a report for NSW DNSPs, May 2014.

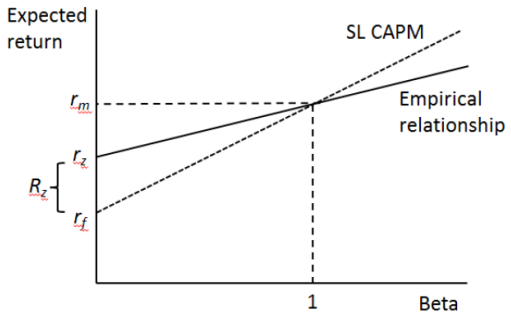
- the **Fama-French** three (or five) factor model (FFM) which introduces additional risk factors to produce an empirically improved estimate of the cost of equity.

The use of these additional CAPM variants was the subject of consultation during IPART's review of its WACC methodology starting in 2017 and extensive discussion and debate in the 2014 AER determinations and subsequent merits and judicial reviews for the NSW distribution NSPs.

An example that outlines the 'low beta bias' associated with the SLCAPM is provided by SFG Consulting (SFG) in an expert report as part of the 2014-19 AER determination process. In this report, SFG stated:

> *The Black CAPM (empirical relationship) is contrasted with the Sharpe-Lintner CAPM in Figure 1 below. Relative to the Sharpe-Lintner CAPM, the Black CAPM posits a higher required return on equity for low-beta stocks. This is consistent with the empirical evidence that returns for low-beta stocks are systematically higher than the Sharpe-Lintner CAPM would predict* [56]

Figure 1. Sharpe-Lintner CAPM vs. empirical relationship.



The above figure provides an illustrative example that, even though the equity beta for the market as a whole as calculated by the SLCAPM equals one as expected, the expected return based on empirical evidence for a low beta firm suggests that the SLCAPM under-estimates the expected return for that firm (i.e. the beta should provide an expected return of $\mathbf{r_z}$ but instead provides an expected return $\mathbf{r_f}$ in the figure above, or a shortfall of $\mathbf{R_z}$).

As IPART awards utility infrastructure businesses with equity betas of less than one in its regulatory determinations, *a priori* setting the return on capital based solely on the SLCAPM would compensated these low beta firms.

We note that IPART considered how (or if) to use other CAPM models (i.e. Black CAPM and Fama-French) in the development of the its 2018 methodology. We consider that:

- IPART has recognised that the SLCAPM has a low beta bias but has attempted to account for this bias through the selection of the Vasicek adjustment rather than the OLS estimation methodology. While the Vasicek adjustment may be an improvement over the OLS estimation methodology, we agree with IPART that this does not directly address the issue of low beta bias that could be addressed through the use of the Black CAPM as outlined below:

  > *Although the Vasicek adjustment is not explicitly designed to address the downward bias of the SL-CAPM, in practice, it can partly compensate for this bias.* [57]

- IPART's stated intention of monitoring the results produced by the Fama-French model (FFM) over a five year period to examine how it would perform if IPART adopted it instead of

[56] SFG Consulting – *The required return on equity: Initial review of the AER draft decisions – Note for ActewAGL, Ausgrid, Essential Energy and Endeavour Energy 19 January 2015*. Paragraph 63, Page 14-15. Source: Ausgrid revised proposal for the 2014-19 AER determination (Appendix 7.04) on the AER's website.
[57] IPART *Review of our WACC method – Final Report, February 2018*. Appendix C, Page 96.

the SLCAPM is not unreasonable. We suggest, however, that if IPART contemplates moving away from an equity beta of 0.7 for the 2020-24 Determination period, then the appropriateness of considering how the FFM could be used to cross check the results of the SLCAPM should be brought forward.

8.6.3.1 IPART's proposed approach to beta calculation

On 1 April 2019, IPART published a Fact Sheet[58] asking stakeholders to comment on a new method of using market data to estimate the equity beta used in the return on equity calculation. This section contains WaterNSW's response to IPART's consultation on this matter.

The equity beta is an input to the WACC. It indicates the level of systematic risk that a firm is exposed to and is used to estimate the cost of equity. The riskier the firm's industry, the higher the beta and the resulting cost of equity.

The cost of equity is an important determinant of the rate of return on capital that a regulated firm is allowed to earn.

In its Fact Sheet, IPART outlined a new analytical process that it is developing for using market data to estimate the equity beta. This new process implements the decisions IPART made in its 2018 WACC review to improve the way it estimates the equity beta. IPART states that:

> *To illustrate how this method would work, we have estimated a water industry beta using our new method. However, we have not applied this estimate in the three current water price reviews, as we are still developing this process and we have not yet consulted with stakeholders on the new method. Instead, we have applied our existing water industry beta in those reviews. We note that our current standard water industry beta (0.7), is similar to the estimate derived here (0.74). We would have regard to the equity beta estimated with this method along with other evidence on beta in our future WACC decisions.*[59]

IPART's proposed methodology to estimating the equity beta is illustrated in the set of 'sample selection rules' that is reproduced below as Figure 8.3.

.

[58] IPART Fact Sheet on equity beta. https://www.ipart.nsw.gov.au/files/sharedassets/website/shared-files/investigation-administrative-legislative-requirements-sea-wacc-methodology-2017/fact-sheet-estimate-equity-beta-1-april-2019.pdf
[59] Ibid. Page 2.

Table 8.1 – IPART's sample selection rule summary

Criteria
Pre-estimation screening rules
Industry
What industry, or industries, should be used to identify proxy firms?
Firm Characteristics
Does the firm operate in the nominated industry?
Does the firm undertake their activities in capital markets that are sufficiently similar to Australia?
Does the firm have a similar operating profile to the benchmark efficient firm?
Market
Is the sovereign's government bond market sufficiently deep and liquid?
Is the sovereign's equity market sufficiently deep and liquid?
Is the firm's international headquarters consistent with their actual operating market?
Operating Profile
Is firm revenue predominately in the nominated industry?
Liquidity filters & data quality
Remove a monthly observation for a given stock if there is less than 10 days of trading data available
Remove a monthly observation for a given stock if the calculated Amihud measure exceeds the threshold of 25.
Remove firm if it has less than 36 months of trading data available.
Post-estimation screening rules
Is the sample size sufficiently large?
Are the estimates consistent (no extreme outliers)?
Are there obvious biases in the results?

Source: IPART Beta Estimation Fact Sheet. Page 3.

WaterNSW is largely supportive of IPART's approach to obtaining as large a dataset as possible in order to calculate the equity beta. We do, however, offer the following comments on the overarching objectives associated with IPART's proposed approach and provide our views on some specific matters.

Overarching objectives

When contemplating whether to depart from the equity beta currently applied by IPART for the water sector (0.7) we suggest that IPART consider the following overarching objectives:

- to attract long-term efficient infrastructure investment to the sector, it is important to provide **longer-term stability** in the equity beta calculation
- when establishing the equity beta of non-listed companies (such as WaterNSW), a **sample of comparable firms** needs to be identified – this necessitates IPART applying sound financial principles and exercising some judgement when determining which countries / industries / companies should be adopted for comparison purposes
- there is statistical variability in the calculation of the equity beta, suggesting that IPART should consider the **largest sample of market data** available for the comparable firms to minimise volatility of results

- the equity beta estimation should be **transparent and repeatable**

- businesses should be provided with the **opportunity to comment** on any proposed revisions to the beta estimation approach that hasn't previously been consulted on as part of the determination process.

We support IPART assessing market data at each review, but IPART exercising caution when contemplating changing the equity beta. This is consistent with the sentiment expressed by IPART in its WACC 2018 Methodology as outlined below:

> *We consider that, for each price review, we should take the opportunity to employ new market data on equity beta, if it becomes available. That is not to say that we would automatically change the equity beta that we use in WACC calculations. We are mindful of the estimation difficulties noted by SDP, and agree with SDP and Sydney Water's suggestions only to change the equity beta estimate if there is that it would improve the accuracy of the WACC estimate.*
>
> …
>
> *We acknowledge stakeholders' concerns that the equity beta should only be changed in response to significant evidence, in order to maintain certainty. Therefore we have decided to review the equity beta at each price review (currently every 4-5 years), but* ***only change it when there is sufficient evidence that our existing estimate is no longer appropriate*** (emphasis added).[60]

WaterNSW agrees that the equity beta (0.7) should only be changed if there is sufficient and compelling evidence that the current estimate is no longer appropriate. We are not convinced that IPART's proposed beta estimation methodology provides this sufficient and compelling evidence.

Firm characteristics

IPART indicates that the industry of the efficiency benchmark firm is a broad proxy for the risk profile of that firm (i.e. that all firms within a common industry group face the same or similar business risks). WaterNSW offers the following comments on IPART's proposed firm characteristics:

- we support IPART's general approach of relying on the classification of **an external data provider** (e.g. Thompson Reuters)

- IPART has used firms in the 'Water' sub-industry definition of the Thompson Reuters Business Classification. In order to ensure the sample size is as large as reasonably practicable, we suggest that this **business classification be expanded** to include Bloomberg Industry Classification Standard, Global Industry Classification Standard, Standard Industry Classification Standard and International Classification Benchmark of the Financial Times Stock Exchange

- in assessing markets that approximate Australia's sovereign characteristics, we request IPART to identify how it will assess whether a market (developed or developing) is '**deep and liquid**' and the rationale for including (or excluding) such markets. In particular, IPART should state whether its assessment is based on qualitative or quantitative evidence and, if the latter, disclose the measurement

- if IPART is concerned over the sample size of international water companies used for beta estimation, we suggest that **Australian non-water infrastructure firms** could be considered. Given that there are no listed water companies in Australia – and all the comparators considered by IPART are overseas firms – IPART may wish to consider a

[60] IPART Review of our WACC Method, Final Report. February 2018, Page 61.

sample of Australian firms that have broadly similar characteristics to NSW water companies, as these firms are likely to reflect country-specific risks associated with operating in Australia. We suggest that if Australian infrastructure firms are used, they should be used in conjunction with, rather than instead of, the sample of international water companies described above.

Liquidity filters and data quality

WaterNSW suggests that IPART review its approach to the following three matters, which we consider departs from regulatory or financial convention when calculating an equity beta:

- **Market rather than book values** – IPART's approach to de-levering and re-levering betas is based on a variable called 'total capital' (calculated as the sum of the book values of debt and equity) obtained from Thomson Reuters. However, Finance theory states that gearing should reflect market values rather than book values and it is finance and regulatory convention to use the market capitalisation rather than the book value of equity. We suggest that IPART uses market capitalisation when de-levering betas

- **Excluding firms with less than 36 months of available data** – after applying its filters, if a given firm has less than 36 months of trading data available, IPART excludes this firm from the sample. IPART considers that a time series of less than three years is too short to calculate a reliable medium-run beta estimate and that, in many instances, a short time series will represent a newly established firm, which is likely inconsistent with IPART's consideration of a mature benchmark efficient firm. Furthermore, short time series are more prone to measurement error, reducing the reliability of results. WaterNSW agrees that there are issues associated with short time series; however, we propose that IPART should require at least 60 (rather than 36) months of valid historical data. This would result in more stable beta estimates over time

- **Estimation period** – IPART uses monthly returns data in its beta estimation based on one reference day (i.e. the last trading day of the month) to calculate monthly returns. Finance literature has shown that beta estimates vary significantly due to sampling error depending on the reference day chosen.[61] Therefore, WaterNSW suggests that IPART use all available reference days in the beta estimation process.

  WaterNSW suggests that weekly data (estimated using all available reference days) is preferable to monthly data as weekly data consists of larger set of datapoints and is therefore likely to be more precise. However, if IPART has a preference to use monthly data, it should estimate betas using all 20 days of the month, rather than solely relying on the last trading day.

- **Tax** – IPART uses de-levering and re-levering formulas that account for corporate taxes. However, given IPART's assumption that gearing is constant over the period, then the de-levering and re-levering formulas should include no tax term. We suggest that IPART adopt the approach to de-levering and re-levering betas using the approach adopted by other regulators which excludes the corporate tax rate term.

Transparency

We encourage IPART to publish all the data and models used to calculate the equity beta. While we recognise IPART's attempt to "automate the process for estimating the equity beta using an R script, which obtains financial market data directly through a Datastream API…[the] advantage of

[61] AER *Equity beta discussion paper*, March 2018, page 33. See SFG, *Equity beta*, May 2014, pages 29-31; SFG, *Estimating the required return on equity, Report for Energex*, 28 August 2014, pages 69-71 and CEG, *Regression estimates of equity beta*, September 2013, page 26, Figure 3.

this approach is that it increases the replicability of our process" [62], we nonetheless are unable to reproduce IPART's proposed 0.74 value. This may be at least partly due to the use of real time data by IPART in its beta estimation.

8.6.4 Market Risk Premium

Under the 2018 methodology, IPART will continue to measure the **historic MRP as a range with a midpoint of 6%**.

IPART has, however, modified its earlier approach and measures for estimating the current MRP. While IPART will still estimate the current MRP value using six different methods and then select a single point estimate, IPART will modify one of the methods – the market indicator method – by replacing two of the indicators previously used (the dividend yield and the risk-free rate) with a single new indicator (earnings yield less the risk-free rate).

IPART will also modify the way its selects a single point estimate for the current MRP to:

- combine the estimates derived by the five dividend discount model (DDM) methods into a single DDM MRP by calculating the median estimate
- calculate the weighted average of this median DDM MRP and the market indicator MRP, giving a two-third weight to the former and a one-third weight to the latter[63].

WaterNSW proposes a **current MRP of 8.6%** based on the application of IPART's February 2019 Bi-annual update.

8.6.5 Value of inflation

For the 2016-20 Determination, IPART calculated the expected inflation rate as the geometric average of the midpoint of the RBA's 1-year ahead inflation forecast and the midpoint of the RBA's target inflation band.

For the 2020-24 Determination, IPART will calculate the average expected inflation rate as the geometric average of:

- the RBA's 1-year ahead inflation forecast in its most recently issued Statement of Monetary Policy (SMP) for the first year of the regulatory period
- the midpoint of the RBA's target inflation band (2.5%), for the remaining years in the regulatory period.

IPART stated in its 2018 WACC Methodology that it will continue to set a post-tax real WACC by adjusting nominal cost estimates for inflation. IPART will, however, adjust both current and historic cost inputs by the expected rate of inflation over the regulatory period instead of the next 10 years, which is a change to its current practice.[64] IPART considers this will reduce the risk under its current approach that, at different points in the economic cycle, IPART over- or underestimates inflation.

IPART will continue to use a geometric average method to calculate the rate of inflation and will make two minor modifications to the way it applies the method IPART will:

[62] IPART equity beta Fact Sheet, page 8.
[63] IPART *Review of our WACC method – Final Report, February 2018.* Page 48.
[64] Ibid. Page 75.

- calculate expected inflation as the geometric average of the change in the level of prices (rather than the inflation rate)

- define the 1-year ahead RBA forecast as the inflation forecast in the RBA's most recently issued SMP that is closest to 12 months ahead of the start of the regulatory period.

The current placeholder estimate for this proposal is an inflation estimate of **2.40 per cent** per annum, which will be updated closer to the beginning of the 2020-24 Determination period. This is consistent with Appendix C as contained in IPART's Review of WaterNSW Prices from 1July 2020 – Submission Information Package provided to WaterNSW on 22 December 2017 for converting 2017-18 dollars into 2018-19 dollars.

8.7 IPART's uncertainty index

As part of its 2013 WACC review, IPART developed a WACC decision-making framework to improve the transparency and predictability of its WACC decisions. As part of this framework, IPART constructed a monthly uncertainty index, which measures the level of economic uncertainty, and used it as a basis for determining an appropriate WACC in its price reviews. IPART's 2018 WACC review maintained its earlier approach to the uncertainty index and has indicated it will apply the following decision-making rule:

- if the uncertainty index is at, or within one standard deviation of, the long- term average of 0, IPART would select the midpoint WACC

- if the uncertainty index is more than one standard deviation from the long- term average of 0, IPART would consider moving away from the midpoint WACC. [65]

IPART has indicated its method for constructing the uncertainty index closely follows the approach taken by the Bank of England in its study of macroeconomic uncertainty.

While IPART's approach to the uncertainty index appears sound, we note that the intent of the index is supposed to trigger a review by IPART if market conditions depart from the long-term average. Given interest rates and bond yields are at historic lows, it is not inconceivable that the uncertainty index could be triggered during the review process.

Should current market conditions continue, WaterNSW seeks the opportunity to comment on whether the uncertainty index is triggered (i.e. is more than one standard deviation from the long-term average) and precisely how IPART would propose to move away from the midpoint WACC in this circumstance.

8.8 Our WACC proposal

WaterNSW proposes that IPART apply its 2018 WACC Methodology, which results in a post-tax real WACC of **4.1 per cent** being estimated for the 2020-24 Determination period. This rate will be updated for the final determination using financial market data observed closer to the start of the 2020-24 Determination period. This compares to a current real post-tax WACC for WaterNSW of 4.9 per cent.

We also propose that annual cost of debt adjustments should be adjusted in annual prices rather than trued-up at the subsequent (i.e. 2024) determination.

The following figure outlines the annual WACC values assumed by WaterNSW in our calculation of proposed revenues and prices in this pricing proposal. The WACC reduces by 12 per cent

[65] IPART *Review of our WACC method – Final Report, February 2018*. Page 99.

between the IPART's allowed WACC from the 2016-20 Determination and our proposed WACC for the 2020-24 Determination period, reflecting estimates of a falling cost of debt over the four-year period.

Table 8.1 – Comparison of current (2016) and proposed (2020) WACCs

WACC Parameter	2016-20 Determination	Proposed 2020-24
Nominal risk free rate (current / long-term)	2.6% / 4.5%	2.4% / 3.6%
Inflation	2.5%	2.4%
Debt margin (current / long-term)	3.2% / 3.1%	2.5% / 2.7%
Debt to total assets	60%	60%
Market risk premium (current / long-term)	8.7% / 6.0%	8.6% / 6.0%
Gamma	0.25	0.25
Equity beta	0.7	0.7
Cost of equity (nominal post-tax)^	8.7%	8.1%
Cost of debt (nominal pre-tax)^	6.7%	5.6%
Nominal Vanilla WACC^	7.5%	6.6%
Post-tax real WACC^	**4.9%**	**4.1%**

^ Mid-point average.

Our proposed WACC is consistent with IPART' rate of return for water utilities as outlined in IPART's 28 February 2019 Bi-annual update addendum.[66]

WaterNSW notes that the operation of IPART's 2018 WACC Methodology is likely to lead to lower debt and equity financing costs in June 2020 when IPART makes its final 2020-24 Determination. This not purely speculation; rather, it is a result of the operation of IPART's 10-year trailing average approach to calculating the cost of debt (where a higher cost post-Global Financial Crisis interest rate tranche is replaced with a much lower contemporaneous interest rate) and the impact of low expected interest rates used in the cost of equity calculation.

A priori, these lower financing costs are expected to lead to price reductions for customers at the commencement of the 2020-24 Determination period compared to the prices contained in this proposal.

[66] See https://www.ipart.nsw.gov.au/files/sharedassets/website/shared-files/information-management-policy-biannual-market-update-%E2%80%93-sea/bi-annual-update-addendum-28-february-2019.pdf. Table 1.

9 Working capital and tax allowances

9.1 Working capital allowance

IPART finalised its updated working capital policy in September 2018 and published a policy paper on this matter in November 2018.[67]

IPART includes an allowance for working capital in the notional revenue requirement to ensure businesses can recover the costs they incur due to delays between them delivering regulated goods or services and receiving payment for those goods or services (net of any benefits they receive due to delays between them receiving goods or services and paying for those good or services). It typically represents around 1% of their notional revenue requirement (NRR).

IPART notes that, while regulators recognise that working capital is a legitimate business expense and should be recovered in regulated prices, not all include an explicit allowance for the expense:

> *Some regulators do not provide an explicit working capital allowance because they use a year-end value of the return of assets (ie, depreciation) and a proxy for the mid-year value of the return on assets in the NRR. This approach tends to create a 'bias' in favour of businesses that receive payments throughout the year, providing these businesses with extra income they can use to fund their working capital requirements. Thus, it provides an implicit working capital allowance. Regulators that use this approach include the AER, ESC, OFGEM and OFWAT.*
>
> *IPART differs from these regulators because we use a mid-year value of the return on and of assets in the NRR. Using a mid-year value does not create the same bias in favour of businesses that receive payments throughout the year, and so does not provide them with an implicit working capital allowance. Therefore, we must include an explicit allowance to ensure the businesses we regulate have sufficient working capital to cover their working capital requirements.*[68]

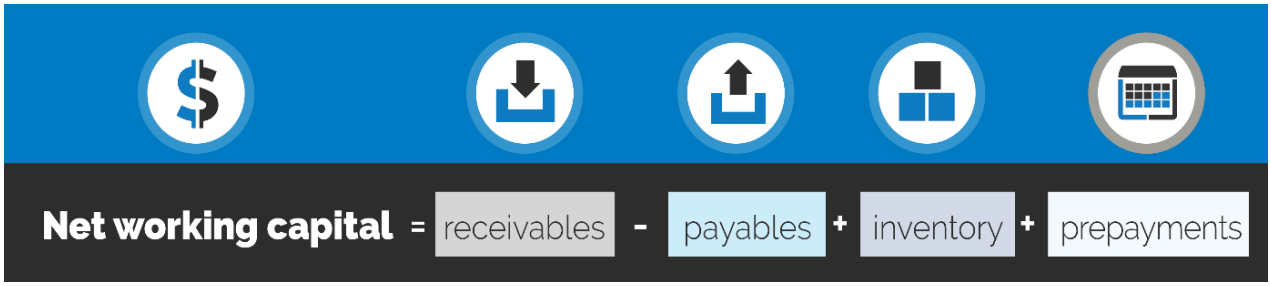
IPART's method for calculating the working capital allowance involves two steps:

- first, IPART calculates the net working capital the business requires. This involves separately calculating four components – receivables; payables; inventory; and prepayments. The method IPART uses to calculate receivables differs for water businesses and non-water businesses. The methods for the remaining components are the same for both groups of businesses
- next, IPART calculates the return on the net working capital, using the nominal post-tax WACC that it calculates as part of the price review. This return represents the working capital allowance.

IPART's overarching approach to calculating an allowance for working capital is illustrated below.

[67] IPART *Working Capital Allowance Policy Paper Final Report Policies.* November 2018.
[68] Ibid. Page 2.

Figure 9.1 – IPART's approach to calculating an allowance for working capital



Source: IPART *Working Capital Allowance Policy Paper Final Report Policies.* November 2018.

The sections below outline IPART's method for calculating each component of the net working capital required and the return on the net working capital.

9.1.1 Receivables

Receivables are payments for goods and services not yet received for services the business has already delivered. IPART calculates receivables in days of annual revenue, using the formula shown in Figure 9.2 below.

Figure 9.2 – How IPART will calculate receivables

Source: IPART *Working Capital Allowance Policy Paper Final Report Policies.* November 2018.

The billing cycle number of days for WaterNSW's Greater Sydney business is 90 days plus a 30 day allowed delay before payment.

9.1.2 Payables

Payables means payments not yet made for goods and services already received. IPART includes payables in net working capital because it expects that an efficient business would delay making payments to its suppliers for as long as possible. This delay would mean that the suppliers are, in effect, providing some of the business's working capital requirements.

IPART calculates payables in days of operating expenditure (operating expenditure) and capital expenditure net of cash capital contributions (net capital expenditure) using a benchmark number of days of expenditure, using the formula shown below.

Figure 9.3 – How IPART will calculate payables

Source: IPART *Working Capital Allowance Policy Paper Final Report Policies.* November 2018.

In general, for the benchmark number of days of delay in making payments to suppliers, IPART uses the standard contract payment period of 30 days as its default position. However, IPART may use a different number if there is a compelling reason to do so.

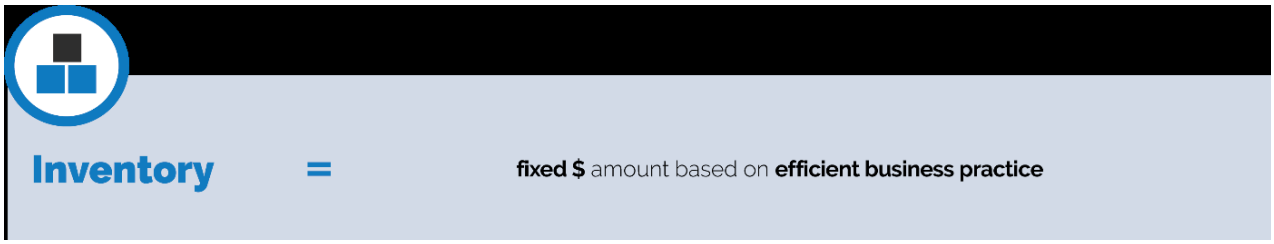
WaterNSW has calculated its working capital allowance for payables using the benchmark assumption of 30 days.

9.1.3 Inventory

Inventory means the goods held in stock by WaterNSW that are inputs into the production process and are necessary for us to meet our service obligations (e.g., spare parts and chemicals).

IPART calculates inventory as a fixed dollar amount that remains unchanged in real terms over the determination period, as shown below.

Figure 9.4 – How IPART will calculate inventory



Source: IPART Working Capital Allowance Policy Paper Final Report Policies. November 2018.

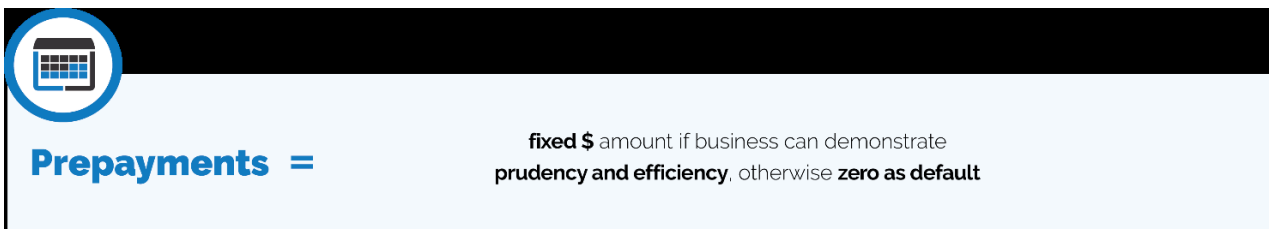
WaterNSW is not proposing an inventory amount over the determination period.

9.1.4 Prepayments

Prepayments are payments made by the business in advance of receiving goods or services. IPART set pre-payments to zero as a default. Based on past experience, IPART considers that prepayments are likely to be small for most businesses and excluding them is likely to have a negligible impact on the NRR.

However, IPART has indicated it will include an amount for prepayments if a business can reasonably demonstrate that the amount is prudent and efficient. If IPART includes prepayments it will set them as a fixed dollar amount that remains unchanged in real terms over the determination period.

Figure 9.5 – How IPART will calculate prepayments



Source: IPART *Working Capital Allowance Policy Paper Final Report Policies.* November 2018.

WaterNSW proposes a prepayment amount of $0.3 million that remains unchanged in real terms over the determination period.

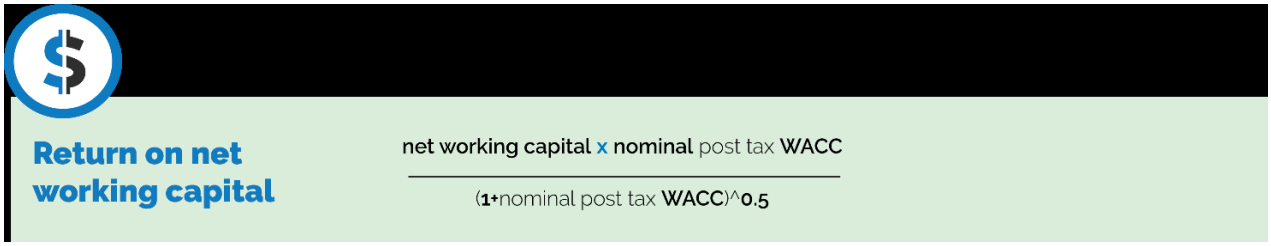
9.1.5 Return on net working capital

To determine the working capital allowance, IPART calculates the return on the net working capital that the business needs each year by:

- multiplying net working capital by the nominal post-tax WACC, and then
- discounting the result to its mid-year value, consistent with our timing assumptions and treatment of return on and of the RAB.

IPART has indicated it will use the formula shown below to calculate the return on working capital.

Figure 9.6 – How IPART will calculate the working capital allowance



Source: IPART Working Capital Allowance Policy Paper Final Report Policies. November 2018.

IPART uses a nominal WACC rather than a real WACC because, unlike the RAB, IPART does not capitalise inflationary gain in net working capital.[69] The return on working capital allowance proposed by WaterNSW is outlined in Table 9.7 below.

Table 9.7 – Proposed allowance for working capital ($millions, 2019-20)

	2020-21	2021-22	2022-23	2023-24	Total
Receivables	42.1	43.9	46.4	47.1	179.6
Inventory	-	-	-	-	-
Prepayments	0.3	0.3	0.3	0.3	1.2
Less: Accounts payable	20.0	25.7	25.9	16.0	87.7
Net working capital	**22.4**	**18.5**	**20.8**	**31.4**	**93.1**
Return on working capital (year-end)	1.5	1.2	1.4	2.1	6.1
Return on working capital (mid-year)	**1.4**	**1.2**	**1.3**	**2.0**	**6.0**

Source: WaterNSW analysis

9.2 Tax allowance

In a post-tax framework, corporate income tax expenses are included as one of the building blocks that make up WaterNSW's total revenue requirement. IPART includes an explicit allowance for tax, because it uses a post-tax WACC to estimate the allowance for a return on assets in the revenue requirement. This allowance reflects the regulated business's forecast tax liabilities.

[69] IPART *Working Capital Allowance Policy Paper Final Report Policies* November 2018. Page14.

This section sets out WaterNSW's approach to calculating the total tax allowance for the regulatory period commencing 1 July 2020.

IPART calculates the tax allowance for each year by applying the statutory corporate tax rate adjusted for franking credits to the business's (nominal) taxable income.[70] The adoption of a corporate tax rate of 30% is consistent with the rate expected to be applicable in the upcoming regulatory period to the benchmark efficient entity that is applied in estimating the WACC and net tax liabilities, being a firm operating in a competitive market and facing similar risks to the regulated business.

Furthermore, in March 2017, the Australian Government enacted legislation that introduced different rates of corporate income tax for businesses of different sizes. Under the legislation, from 1 July 2018, businesses with an aggregated turnover of less than $50 million (base rate entities) pay 27.5% tax, while those with a higher turnover pay 30% tax on all their taxable income. From 2024-25, base rate entities will pay 27.0% tax, and this rate will reduce to 26.0% in the following year and 25.0% in 2026-27.

The annual turnover for providing water services to Greater Sydney is greater than $50 million and therefore the lower tax rates would not apply to WaterNSW. Notwithstanding we note that even if the Greater Sydney business operated as a separate business (which is does not), tax law requires the determination of aggregated turnover (a key factor in eligibility as a base rate entity) to include the turnover of connected entities. Therefore, even if the annual turnover was less than $50 million (which it is not), the applicable corporate income tax rate is **30%**.

Taxable income is the notional revenue requirement (excluding tax allowance) less operating cost allowances, tax depreciation and interest expenses.

As part of calculating the appropriate tax allowance, the business is required to provide forecast tax depreciation for the determination period. Other items such as interest expenses are based on the parameters used for the WACC and the value of the tax RAB.

The total tax allowance is calculated following the same methodology as used in the 2016-20 Determination for WaterNSW as follows.

Total tax allowance =

Notional revenue requirement (excluding tax liability)
− Operating expenditure
− Tax depreciation
− Interest expense
= Taxable income
− Accumulated tax losses
= Taxable income after tax losses
x Adjusted corporate tax rate[71]
= Tax before adjustment for franking credits
− Adjustment for franking credits
= Total tax allowance

Each of these inputs is determined as follows:

- the calculation of the notional revenue requirement is set out in Chapter 11 'Revenue, prices and customer bill impacts'

[70] Under IPART's post-tax framework, the value of franking credits (gamma) enters the regulatory decision directly only through the estimate of the tax liability.
[71] Calculated as Taxable Income x T / (1-T(1- γ)), where T is the corporate tax rate (0.30) and γ is the value of franking credits(gamma, 0.25).

- cash and in-kind contributions, such as gifted assets and capital contributions are included in recognition of the tax liabilities associated with these items. WaterNSW is not forecasting any cash or in-kind contributions

- interest expenses are calculated by multiplying the RAB by the cost of debt, adjusted for the level of gearing (i.e. the share of debt funding) as discussed in Chapter 8 'Rate of return'

- the approach used for estimating operating expenses is discussed in Chapter 6 'Operating expenditure'

- previous year losses are the accumulated tax losses from prior years. If the taxable profit calculated above (excluding previous year losses) results in a loss, then these losses are carried forward and tracked over time.

The adjustment for gamma is discussed in Section 9.2.2 below.

9.2.1 Tax on gifted assets

Gifted assets are assets that utilities receive for free, usually from developers. Gifted assets do not affect the RAB, and utilities do not earn a return on or of those assets. Utilities, however, are required to pay tax equivalents on the value of gifted assets. WaterNSW is not forecasting any gifted assets.[72]

9.2.2 Tax imputation credits

Under the Australian taxation system, tax credits (imputation credits) created by an Australian company may be redeemed by domestic shareholders. An imputation credit is created for each dollar of eligible tax paid by companies. Imputation credits are distributed to shareholders through the payment of franked dividends. Imputation credits therefore represent a benefit to domestic shareholders for their investment in the company in addition to dividends.[73]

Investors should be prepared to accept a lower rate of return for an investment with imputation credits attached than if there were no imputation tax credits attached. If the benefit to domestic shareholders of imputation credits is not taken into account, the amount of revenue required to provide an appropriate return to investors would be overstated.

While WaterNSW, as a publicly owned business, does not pay out franked dividends, an adjustment for the value of imputation credits is required to maintain consistency with the benchmark efficient entity approach (see Section 8 'Rate of return'). This is consistent with the 2014 IPART decision where an adjustment was made to the tax allowance for imputation credits. IPART's 2018 WACC Methodology[74] adopted a value of 0.25 for imputation credits.

Value of imputation credits

The regulatory approach generally used in Australia to account for imputation credits is to reduce the estimated amount of corporate tax by the value of imputation credits (represented by the Greek letter 'γ', gamma).

Gamma is always less than one, reflecting the following factors:

[72] Section 21A, Income Tax Assessment Act 1936. See IPART, *The incorporation of company tax in pricing determinations – Final Decision*, December 2011, p 15.
[73] Imputation credits are of no value to foreign shareholders and not all credits distributed to domestic shareholders are redeemed.
[74] IPART's February 2018 Final Report *Review of our WACC Method*, page 76.

- companies generally do not distribute all profits as dividends
- foreign investors are not able to redeem imputation credits
- some Australian investors cannot utilise imputation credits
- shareholders entitled to utilise imputation credits do not always do so
- shareholders that do utilise imputation credits may not value them at the full face value.

Gamma is calculated as the distribution rate (the value of imputation credits distributed by a firm as a proportion of the value of imputation credits generated by it) multiplied by the utilisation rate, also referred to as 'theta' (the value of imputation credits distributed to investors as a proportion of their face value).

WaterNSW proposes a value of **0.25 for imputation credits**, consistent with IPART's stated approach, based on a distribution rate of 0.7 and a utilisation rate of 0.35.

9.2.3 Tax depreciation

Tax depreciation for assets commissioned as at 30 March 2019 in the current regulatory period is based on the value of assets in WaterNSW's Tax Fixed Asset Register, which is depreciated using the diminishing / accelerated depreciation method.

Tax depreciation for assets acquired since the 30 March 2019 is calculated by establishing a Tax Asset Base for new assets utlising a 60-year average asset life consistent with the RAB and using the diminishing / accelerated depreciation method. Consistent with RAB assumptions, 50% of capital expenditure is depreciated in the year in which the capital expenditure was incurred. Inflation was not applied to the value of the tax asset base.

9.2.4 Total tax allowance

The resulting net tax expenses used in calculating maximum allowed revenues are set out below. This calculates the taxable income after tax losses, multiplies the taxable income after tax losses by the adjusted corporate tax rate (described in Footnote 71) and adjusts the tax payable by the value of imputation credits. The total tax allowance is shown in the tables below.

Table 9.8 – Tax allowance ($millions, $nominal)

	2020-21	2021-22	2022-23	2023-24	Total
Notional revenue requirement (excl. tax)	210	224	243	253	929
Less:					
Operating expenditure	99	101	105	103	408
Tax depreciation	33	38	44	48	164
Interest expense allowance	65	72	80	86	303
Taxable income	**13**	**13**	**14**	**15**	**55**
Less accumulated tax losses	-	-	-	-	-
Taxable income after tax losses	13	13	14	15	55
Tax before adjustment for franking credits	5	5	5	6	21
Less: Adjustment for franking credits	-1	-1	-1	-1	-5
Tax allowance	**4**	**4**	**4**	**4**	**16**

Source: WaterNSW analysis

Converting the nominal tax allowances in Table 9.8 to real ($2019-20) dollars results in the tax allowances provided in Table 9.9 below. These allowances are used in the build-up of our notional revenue requirements as outlined in Chapter 11 'Revenue requirement'.

Table 9.9 – Tax allowance ($millions, $nominal)

	2020-21	2021-22	2022-23	2023-24	Total
Tax allowance in required revenue	5	5	5	5	20
Less adjustment for franking credits	-1	-1	-1	-1	-5
Tax allowance	**4**	**4**	**4**	**4**	**15**

Source: WaterNSW analysis

10 Sales volumes and customer numbers

Once IPART determines the revenue requirement for the 2020-24 Determination period, the next step in the price setting approach is to decide on WaterNSW's forecasts for water sales and customer numbers. These forecasts are used in calculating the price levels to recover the required revenue.

It is important that the forecasts are reasonable. If they differ from WaterNSW's actual water sales over the determination period, the determined prices will result in the utility over- or under-recovering its required revenue.

WaterNSW's customer numbers are stable and Sydney Water accounts for approximately 99% of our total water sales in Greater Sydney, so the effect of customer numbers is not as important in setting prices as forecast water sales.

10.1 Customer numbers

Table 10.1 outlines out Greater Sydney customers numbers for the current regulatory period separated into wholesale customers and raw and unfiltered water customers. WaterNSW supplies water to four wholesale customers: Sydney Water and three councils (Wingecarribee Council, Shoalhaven City Council and Goulburn Mulwaree Council). Wholesale customers are characterised as those who draw water from designated bulk supply points. Raw water undergoes treatment before supply to end use customers in the wholesale customers' respective operating areas.

Table 10.1 – Actual customer numbers for the 2016-20 Determination period

	2016-17	2017-18	2018-19	2019-20
Wholesale customers	4	4	4	4
Raw water	7	6	6	6
Unfiltered water	53	53	53	53
Total customers	**64**	**63**	**63**	**63**

Source: WaterNSW analysis

Table 10.2 outlines our forecast customer numbers for the 2020-24 Determination period.

Table 10.2 – Forecast customer numbers for the 2020-24 Determination period

	2019-20	2020-21	2021-22	2022-23	2023-24
Wholesale customers	4	4	4	4	4
Raw water	6	6	6	6	6
Unfiltered water	53	53	53	53	53
Total customers	**63**	**63**	**63**	**63**	**63**

Source: WaterNSW analysis

We also supply 63 small retail customers (raw water and unfiltered water customers) directly from our water supply system. Raw water customers extract water directly from dams and are generally commercial users such as mines. Unfiltered water customers generally extract water downstream of dams (e.g. draw supply from various points along transmission lines such as

pipelines and the Upper Canal) and are usually semi-rural residential users. The unfiltered water is not suitable for human consumption without further treatment.

10.2 Water sales

Sydney Water accounts for about 99% of WaterNSW's total water sales for Greater Sydney. The remaining 1% of sales is water supplied to our three council customers and our raw and unfiltered water customers.

WaterNSW does not conduct its own end user water demand forecast for Sydney Water's end use customers. This function is conducted by Sydney Water as it has access to the detailed customer usage and billing data, which WaterNSW does not possess. Sydney Water regularly provides demand forecast updates to WaterNSW for both operational planning and financial modelling purposes.

IPART ensures that there is consistency in water sales estimates as part of the concurrent reviews for the WaterNSW Greater Sydney and Sydney Water determinations.

The demand forecast used in this pricing proposal is based on the latest update provided by Sydney Water in April 2019 and incorporates the latest population projections for Sydney.

Table 10.3 below shows the change in water demand compared to the 2016-20 Determination forecast. It is important to note that the new demand forecast includes changes in historic usage.

Table 10.3 – Actual / Forecast sales compared to the 2016-20 Determination (megalitres)

	2016-17	2017-18	2018-19	2019-20	Total
Forecast demand in IPART 2016-20 Determination (ML)					
Sydney Water	532,125	539,433	543,943	550,135	2,165,636
Wingecarribee Shire Council	4,800	4,800	4,800	4,800	19,200
Shoalhaven City Council	90	90	90	90	360
Goulburn Mulwaree Council	108	108	108	108	432
Raw water customers					0
Unfiltered customers	220	220	220	220	880
Total forecast demand	**537,343**	**544,651**	**549,161**	**555,353**	**2,186,508**
Actual / forecast water sales (ML)					
Sydney Water	558,231	601,069	564,870	570,304	2,294,474
Wingecarribee Shire Council	5,243	5,802	5,977	6,097	23,119
Shoalhaven City Council	107	126	109	106	448
Goulburn Mulwaree Council	34	31	50	80	195
Raw water customers	8	4	6	5	22
Unfiltered customers	121	173	184	147	625
Total forecast demand	**563,744**	**607,205**	**571,196**	**576,739**	**2,318,883**
Variation to 2016-20 Determination					
Sydney Water	26,106	61,636	20,927	20,169	128,838
Wingecarribee Shire Council	443	1,002	1,177	1,297	3,919
Shoalhaven City Council	17	36	19	16	88
Goulburn Mulwaree Council	-75	-77	-58	-28	-238
Raw and unfiltered	-91	-43	-31	-68	-233
Total forecast demand	**26,401**	**62,554**	**22,035**	**21,386**	**132,375**

Source: WaterNSW analysis

The actual / forecast sales in Table 10.3 above are **6.1% higher** than IPART's forecast volumes from the IPART 2016-20 Determination, with annual growth forecast to be **1.9%** over the current regulatory period.

Table 10.4 below provides our forecast for water sales over the 2020-24 Determination period.

Table 10.4 – Forecast sales for the 2020-24 Determination (megalitres)

	2020-21	2021-22	2022-23	2023-24	Total
Sydney Water	575,928	582,798	589,588	598,136	2,346,449
Wingecarribee Shire Council	6,219	6,343	6,470	6,600	25,632
Shoalhaven City Council	108	110	112	114	444
Goulburn Mulwaree Council	50	50	50	50	200
Raw water customers	5	5	5	5	19
Unfiltered customers	147	147	147	147	588
Total forecast demand	**582,457**	**589,453**	**596,372**	**605,051**	**2,373,332**

Source: WaterNSW analysis

The forecast sales in Table 10.4 above represent an annual growth rate increase of **1.2%** compared with the 2019-20 water sales forecast with most of the growth attributed to Sydney Water.

11 Revenue requirement

WaterNSW's proposed revenue requirement falls from $224 million in 2019-20 to $209 million in 2020-21 before rising to $234 million in 2023-24. Our proposed revenue requirement represents the efficient costs of meeting our legislative and regulatory obligations and customer service standards.

11.1 Total revenue requirement

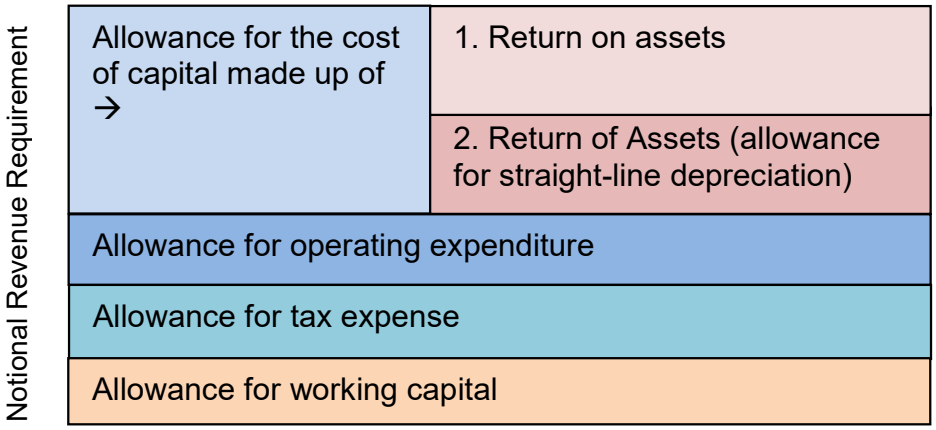
This section sets out WaterNSW's approach to calculating the total revenue requirement.

As discussed in Section 4.1.1, we propose the use of a building block approach to calculate WaterNSW's total revenue requirement in each year of the determination period, based on IPART's standard methodology from the 2016-20 Determination.

The total revenue requirement represents the efficient costs that can be recovered by WaterNSW for the provision of monopoly services. The revenue requirement is set by IPART at efficient levels to ensure that WaterNSW can meet its legislative and regulatory obligations as well as any service standards and customer driven discretionary requirements.

A diagram of the building blocks revenue is shown below:

Figure 11.1 – Total 'Building block' revenue requirement



Section 5 'Capital expenditure', Section 6 'Operating expenditure', Section 7 'Regulatory asset base', Section 8 'Rate of return' and Section 9 'Working capital and tax allowances' discuss in detail the components that comprise the notional revenue requirement.

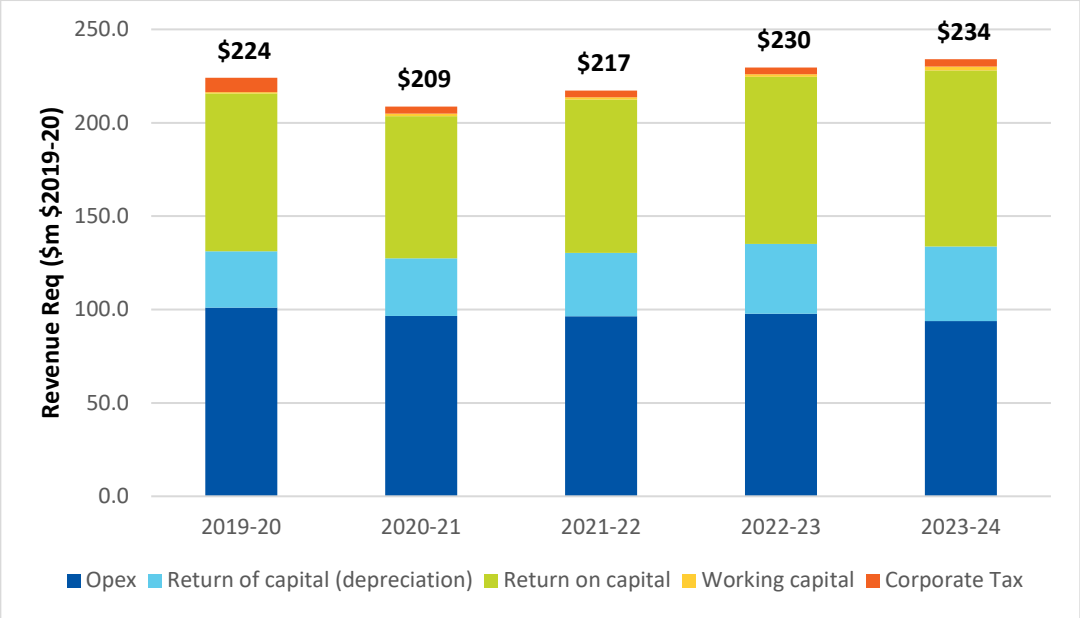
WaterNSW's proposed total revenue requirement for the 2020-24 Determination period is outlined in Table 11.1 and illustrated in Figure 11.2 below:

Table 11.1 – Total revenue requirement ($millions, $2019-20)

	2019-20	2020-21	2021-22	2022-23	2023-24	Total FY21-24
Operating Expenditure	101.0	96.5	96.4	97.8	93.7	384.4
Return on Assets	84.5	76.1	82.1	89.4	94.3	341.9
Return of Assets (Depreciation)	30.2	30.9	33.9	37.4	40.0	142.3
Return on Working Capital	0.8	1.4	1.2	1.3	2.0	6.0
Regulatory Tax Allowance	7.6	3.6	3.7	3.7	4.0	15.0
Total Revenue Requirement	**224.0**	208.6	217.3	229.6	234.1	**889.6**

Source: WaterNSW analysis.

Figure 11.2 – Total revenue requirement ($millions, $2019-20)



Source: WaterNSW analysis

Our proposed notional revenue requirement reduces from $224 million ($2019-20) in 2019-20 (the last year of the 2016-20 Determination period) to $209 million in 2020-21 before increasing to $234 million in 2023-24.

11.2 Notional revenue requirement and target revenue

WaterNSW's revenue for our Greater Sydney business is predominantly raised through water prices, however, we also generate some revenue through other charges. We first deduct the revenue generated from these other sources, and then set water prices for our major services to raise the remaining amount of revenue. We do this so that revenue received from other fees and charges is not double counted in our proposed prices.

Finally, we estimate the target revenue that is expected to be raised by WaterNSW through the charges set by IPART. While this revenue is the same as the notional revenue requirement in net present value (NPV) terms over the determination period, this revenue is not necessarily the same as the notional revenue requirement in each year. Where there are significant jumps or drops in the notional revenue requirement from one year to the next, we may propose an alternative path to minimise potential price or revenue shocks for customers and provide a smoother transition over the determination period.

Our proposed target revenue and a comparison to our proposed notional revenue requirement is shown in Table 11.2.

Table 11.2 – Proposed notional revenue requirement and target revenue ($millions, $2019-20)

	2020-21	2021-22	2022-23	2023-24	Total
Total revenue requirement	208.6	217.3	229.6	234.1	889.6
Less: Non Regulated Revenue	0.1	0.1	0.1	0.1	0.4
Notional revenue requirement	208.5	217.2	229.6	234.0	889.2
Target Revenue from Prices	**220.9**	**221.5**	**222.0**	**222.7**	**887.2**

Source: WaterNSW analysis

As illustrated in Table 11.2 above, our proposed target revenue to be recovered from prices provides a much smoother trajectory than the notional revenue requirement. This is expected to provide customers with greater pricing stability over the determination period.

The following chapter addresses how the target revenue to be recovered from prices is translated into customer prices.

11.3 Revenue over the 2016-20 Determination period

Table 11.3 compares the revenue set by IPART in the 2016-20 Determination with the expected actual revenues of WaterNSW over the period.

Table 11.3 – Comparison of allowed and actual revenues during the 2016-20 Determination period ($millions, $2019-20)

	2016-17	2017-18	2018-19	2019-20	Total
Revenue in 2016-20 Determination	211.1	213.9	218.7	221.0	864.8
Actual revenue	213.7	219.3	220.5	222.1	875.6
Variance ($)	2.6	5.5	1.8	1.1	10.9
Variance (%)	**1.2%**	**2.6%**	**0.8%**	**0.5%**	**1.2%**

Source: WaterNSW analysis.

As illustrated above, expected revenues over the current regulatory period are forecast to be **1.2%** above those set by IPART at the 2016-20 Determination. This is a result of higher than allowed revenues due to additional Sydney Water volumes as discussed in Section 10.2 ‘Forecast water sales’ multiplied by our actual variable charges.

12 Proposed prices and customer bill impacts

12.1 Prices for Sydney Water

Proposed prices for Sydney Water for the 2020-24 Determination period with SDP in shutdown mode are provided in Table 12.1.

Table 12.1 – Proposed prices for Sydney Water – Sydney Desalination Plant OFF ($2019-20)

	2019-20	2020-21	2021-22	2022-23	2023-24
Fixed Charge ($M/Year)	175	175	176	176	177
Variable Charge ($/ML)	80	76	75	75	74
Revenue from Fixed Charge ($M/Year)	175	175	176	176	177
Revenue from Variable Charge ($M/Year)	45	44	44	44	44
Total Revenue ($M)	**221**	**219**	**220**	**220**	**221**

Source: WaterNSW analysis

For the 2020-24 Determination period, WaterNSW's proposal will see the cost of raw water to Sydney Water decrease by **1%** in 2020-21 (assuming SDP in shutdown mode), or less than the forecast rate of inflation, and remain relatively flat in real terms for the subsequent three years.

For the SCA 2012 Determination[75], IPART accepted SCA's proposal to calculate prices to Sydney Water based on the short-run marginal cost approach where the variable price to Sydney Water was set to recover 20% of the revenue requirement and the fixed price recovering the remaining 80%. For the 2016-20 Determination, WaterNSW proposed (and IPART agreed) to retain this pricing structure. The high fixed to variable price ratio reflects the fixed cost nature of WaterNSW's business and provides cost certainty to our largest customer.

For the upcoming determination, WaterNSW once again proposes to maintain the existing price structure where 80% of revenue from Sydney Water is collected through the fixed charge.

12.1.1 Impact of Sydney Desalination Plant operation on prices

The SDP price schedule was first introduced for SCA's 2012 Determination in recognition of the revenue volatility that SDP's operation would inflict on SCA. The 'SDP price schedule' allows the variable charge to Sydney Water to increase when SDP is in full operation mode so that WaterNSW receives sufficient revenue to cover its IPART determined revenue.

The SDP price schedule from SCA's 2012 Determination was tied to specific modes of operation under the operating rules at that time and therefore it does not provide for changes to these modes of operation or operating rules as determined by the NSW Government. To ensure the integrity of IPART's determined efficient revenue, WaterNSW proposed the incorporation of a mechanism to adjust the SDP price schedule in the case that the NSW Government changed the SDP modes of operation or operating rules.

As discussed in Section 4.6, in the 2016-20 Determination, IPART applied a pro-rata equation charging formula that calculates a volumetric price charged to Sydney Water for each ML of water supplied in each month. WaterNSW is proposing to maintain this charging formula for the 2020-24 Determination period.

[75] Refer to https://www.ipart.nsw.gov.au/files/sharedassets/website/trimholdingbay/determination_-_review_of_prices_for_the_sydney_catchment_authority_from_1_july_2012_to_30_june_2016.pdf

Proposed prices for Sydney Water for the upcoming determination period with SDP fully operational (assuming 90,000 MLs per year from1 July 2020) are provided in Table 12.2.

Table 12.2 – Proposed prices for Sydney Water – Sydney Desalination Plant ON ($2019-20)

	2019-20	2020-21	2021-22	2022-23	2023-24
Fixed Charge ($M/Year)	175	175	176	176	177
Variable Charge ($/ML)	80	90	89	88	87
Revenue from Fixed Charge ($M/Year)	175	175	176	176	177
Revenue from Variable Charge ($M/Year)	45	44	44	44	44
Total Revenue ($M)	**221**	**219**	**220**	**220**	**221**

Source: WaterNSW analysis

For the 2020-24 Determination period, WaterNSW's proposal would see the cost of raw water to Sydney Water increase by 2.3% in 2020-21 assuming SDP is fully operational and would remain relatively flat in real terms for the subsequent three years.

12.2 Prices for Council customers

Proposed prices to Council customers are shown in Table 12.3 below.

Table 12.3 – Proposed prices for Council customers ($2019-20)

	2019-20	2020-21	2021-22	2022-23	2023-24
Fixed Charge ($ millions)					
Wingecarribee Council	1.12	1.11	1.11	1.11	1.11
Shoalhaven City Council	0.02	0.02	0.02	0.02	0.02
Goulburn-Mulwaree Council	0.03	0.02	0.02	0.02	0.02
Variable charge ($/megalitre)					
Variable (volumetric) Charge ($/megalitre)	58	58	58	58	58
Total revenue from Councils ($ millions)	**1.53**	**1.52**	**1.53**	**1.53**	**1.54**

Source: WaterNSW analysis

WaterNSW is proposing to reduce current fixed and variable charges to each Council by 1% in in real terms over the 2020-24 Determination period. We have moved away from the approach in the 2016-20 Determination where the revenue requirement from Council customers was based on the derived cost of each council based on their location of the network. Once the derived costs were calculated, the pricing structure was overlaid to determine the fixed and variable component of the prices.

We have moved to an approach of maintaining charges in real terms to remove pricing uncertainty associated with volume forecasts for the Councils that would lead to significant price shocks for some Councils.

For the 2020-24 Determination period, WaterNSW is proposing to continue to align Council customers' price structure with that of Sydney Water – a fixed/variable ratio of 80%:20%. The application of a high fixed charge reflects the cost base of WaterNSW's business and recognises the highly secure nature of water availability to Councils.

12.3 Prices for raw and unfiltered water customers

Proposed prices to unfiltered and raw water customers are shown in Table 12.4.

Table 12.4 – Proposed prices for raw water and unfiltered water customers ($2019-20)

	2019-20	2020-21	2021-22	2022-23	2023-24
Raw water customers					
Fixed Charge ($)	0	0	0	0	0
Variable (volumetric) Charge ($/ML)	736	729	729	729	729
Revenue from Fixed Charge ($000s/year)	0	0	0	0	0
Revenue from Variable Charge ($000s/year)	3.50	3.47	3.47	3.47	3.47
Unfiltered customers					
Fixed Charge for 20mm Meter ($)	112	111	111	111	111
Fixed Charge for 25mm Meter ($)	176	174	174	174	174
Fixed Charge for 30mm Meter ($)	253	250	250	250	250
Fixed Charge for 32mm Meter ($)	288	285	285	285	285
Fixed Charge for 40mm Meter ($)	450	445	445	445	445
Fixed Charge for 50mm Meter ($)	703	696	696	696	696
Fixed Charge for 80mm Meter ($)	1,799	1,781	1,781	1,781	1,781
Fixed Charge for 100mm Meter ($)	2,810	2,783	2,783	2,783	2,783
Fixed Charge for 150mm Meter ($)	6,323	6,261	6,261	6,261	6,261
Fixed Charge for 200mm Meter ($)	11,241	11,131	11,131	11,131	11,131
Variable (volumetric) Charge ($/ML)	1,280	1,268	1,268	1,268	1,268
Revenue from Fixed Charge ($000s/year)	6	6	6	6	6
Revenue from Variable Charge ($000s/year)	188.35	186.51	186.51	186.51	186.51
Total revenue ($'000)	**197.81**	**195.88**	**195.88**	**195.88**	**195.88**

Source: WaterNSW analysis. Revenue is calculated based on forecast sales volumes and the assumption that all customers have a 20mm meter

For SCA's 2012 Determination, SCA proposed to align the price structure of small customers with the price structure of the retail network. This strategy ensured customers did not face a price shock if they connected to the distribution network and was consistent with previous pricing proposals that prices for small customers should not provide incentives for customers to connect or disconnect from alternative supply. This proposal was accepted by IPART.

For the 2016-20 Determination, WaterNSW proposed to maintain the same pricing methodology for unfiltered and raw customers. In order to promote pricing stability for raw water and unfiltered water customers, for the 2020-24 Determination period WaterNSW is proposing to maintain current fixed and variable charges for raw water and unfiltered water customers in real terms (i.e. increase annually by CPI).

12.4 Customer bill impacts

In developing prices, WaterNSW has been mindful of the impact on its direct and end use customers. For the 2020-24 Determination, our proposed prices to customers will be lower in real terms compared to the prices in the final year of the current determination (2019-20). Our proposed prices are affordable and will continue to deliver high quality water.

This section presents the bill impacts of our pricing proposal in real dollars (excluding the effects of inflation) for the 2020-24 Determination period consistent with IPART's post-tax building blocks model which calculates WaterNSW required revenues in real dollars.

12.4.1 Bill impact for Sydney Water customers

Table 12.5 below shows how WaterNSW's proposed prices will contribute to a marginal price increase to Sydney Water's end customers through each year of the determination period. The calculation below is based on the average bill of an individually metered residential property.

Table 12.5 – Bill impact for Sydney Water's end use customers ($2019-20)

	2019-20	2020-21	2021-22	2022-23	2023-24
Pass through to customers ($)	$99.46	$98.60	$98.84	$99.08	$99.39
Change attributable to WaterNSW (%)	N/A	-0.07%	-0.05%	-0.03%	-0.01%

Source: WaterNSW analysis

As illustrated above, our proposed prices would result in a $0.86, or 0.07%, reduction to a Sydney Water end customer's bill in 2020-21, on the basis that WaterNSW's costs represent approximately 8.23%[76] of Sydney Water' total costs.

12.4.2 Bill impact for Council customers

Table 12.6 illustrates the impact of WaterNSW's provided prices in constant dollar (or 'real') terms for Council customers for the 2020-24 Determination period.

Table 12.6 – Bill impact for Council customers ($2019-20)

	2019-20	2020-21	2021-22	2022-23	2023-24
Revenue from Fixed Charge	1,163,542	1,152,198	1,152,198	1,152,198	1,152,198
Revenue from Variable Charge	365,684	367,554	374,816	382,251	389,859
Total revenue	**1,529,225**	**1,519,751**	**1,527,014**	**1,534,449**	**1,542,057**
Equivalent $/ML	243.40	238.32	234.82	231.37	227.98
% Change		**-2%**	**-1%**	**-1%**	**-1%**

Source: WaterNSW analysis

We are proposing to decrease Council prices by 1% in the first year with no real price increases in the following years of the 2020-24 Determination period. This is consistent with the approach to raw and unfiltered water prices.

12.5 Affordability

We are conscious of the impact that prices for bulk water can have on end use customers and we have taken steps to ensure that our proposal represents the least cost approach to meeting our legal obligations and delivering high quality water.

In preparing this pricing proposal, we were mindful to keep prices below changes in the consumer price index. WaterNSW's proposal will see the cost of raw water to Sydney Water decrease by 1% in real terms over the 2020-24 Determination period (assuming SDP in shutdown mode).

[76] This percentage may change dependent on Sydney Water's notional revenue requirement which will only be ascertainable at the conclusion of IPART's concurrent review process.

As WaterNSW's cost represent approximately 8% of Sydney Water's charges to residential customers, and our prices are proposed to fall marginally in real terms, we consider that our proposed revenues would not add to customers' affordability concerns.

The pricing outcome under the proposal maintains a responsible balance between ensuring we have the funding to continue do deliver a safe and secure water supply while ensuring affordability for end use customers through prices that are at or below the rate of inflation in each year of our four-year proposal.

12.6 Financial viability

In 2018, IPART reviewed the financeability test it uses as part of its price regulation process. When making price determinations for regulated businesses, IPART uses a financeability test (the 2018 test) to assess how its pricing decisions are likely to affect the business's financial sustainability and ability to raise funds to manage its activities, over the regulatory period.[77]

IPART previously reviewed the financeability test in 2013[78] (the 2013 test) and made small changes in early 2015.[79] The general feedback IPART received from stakeholders during consultation for the 2018 test was that the 2013 financeability test worked well and that reviewing the approach to financeability is "*important in ensuring that IPART's approaches to regulation remain fit for purpose over time, reflect evolving regulatory best practice, and are well understood by all stakeholders*."[80]

The objectives of the financeability test are to:

- ensure IPART's pricing decisions would allow an efficient investment grade rated business to raise finance during the regulatory period (benchmark test)
- assess whether the utility would meet this benchmark (actual test) during the regulatory period.

IPART's 2018 test maintains a number of elements from the 2013 test, including that IPART will continue to:

- conduct a quantitative assessment of financeability
- conduct a financeability test if:
    - the prices IPART regulates determines the revenues of the business, and
    - the business has, or is part of an entity with, a distinct capital structure
- conduct the test on the regulated portion of the business, as a default, and
- retain a BBB[81] target credit rating.

IPART made a number of refinements in its 2018 test, including to:

[77] IPART Review of our financeability test – Final Report, November 2018. Page 1.
[78] Refer to https://www.ipart.nsw.gov.au/files/sharedassets/website/trimholdingbay/final_decision_-_financeability_tests_in_price_regulation_-_december_2013.pdf
[79] Refer to https://www.ipart.nsw.gov.au/files/sharedassets/website/trimholdingbay/fact_sheet_-_final_decision_-_financeability_ratios_-_april_2015.pdf
[80] Ibid. Page 1. The quotation provided refers to the SDP submission to the IPART Issues Paper, June 2018, page 1.
[81] According to IPART, an S&P Global credit rating of BBB is equivalent to a Moody's Baa2 credit rating. Note that we use a BBB credit rating when setting the Weighted Average Cost of Capital (WACC). Financeability Test Final Report November 2018, page 2.

- include a benchmark test (assuming a real cost of debt), and an actual test (using the business's actual cost of debt)
- set a single target ratio for each financial metric rather than a range (as per the 2013 test) to increase simplicity and eliminate the overlap of ratios
- adopt a clearer process for identifying a financeability concern
- tailor the remedy for a financeability concern to its source.

In setting prices, IPART aims to ensure that utilities are financially sustainable so that they can recover their efficient costs over the long-term. Under IPART's building block model, IPART sets prices to recover the efficient costs of a benchmark business. This includes a market-based rate of return for equity and debt holders. Robust financial health of utility businesses is generally considered to be in the best interests of customers.

If a service provider is not financially viable, it may not be able to guarantee services to customers. Poor financial health may also lead to under-investment in assets and / or their maintenance, which could in turn lead to higher lifetime expenditure on assets (and consequently higher prices) and poorer quality services.

IPART's financeability test assesses the short-term financial sustainability of the utility – whether the utility will be able to raise the necessary debt financing, consistent with an investment grade-rated firm, during the regulatory period.

12.6.1 Target credit rating of BBB

IPART intends to use the same target credit rating in the financeability test as it uses when setting the WACC. According to IPART, this target credit rating ensures consistency with the WACC and achieves the objectives of the financeability test to assess whether the regulatory decisions are sufficient to maintain the financeability of a benchmark efficient business.

Based on the credit rating metrics calculated in IPART's water model (provided as an attachment to this pricing proposal), the revenues and prices proposed by WaterNSW would result in acceptable financial and credit rating metrics.

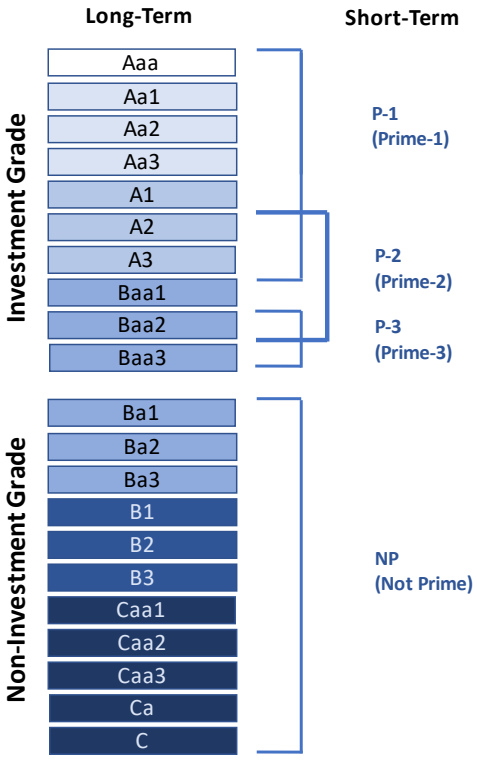
IPART uses the S&P Global BBB credit rating when setting the WACC. An S&P Global BBB credit rating is equivalent to a Moody's Baa2 credit rating and a Fitch Rating BBB credit rating.[82]

IPART's 2018 test sets a threshold (i.e., a minimum or maximum) value for each ratio that a BBB rated business would meet under IPART's building block approach. According to Moody's, any of the 'Baa' ratings suggests moderate credit risk, with firms "considered medium-grade and as such may possess speculative characteristics".[83]

As outlined in Figure 12.2 below, a credit rating in this range is at the low end of what Moody's considers 'investment' grade.

[82] IPART *Review of our financeability test – Final Report, November 2018*. Page 35.
[83] Moody's Rating Scale and definitions, https://www.moodys.com/sites/products/ProductAttachments/AP075378_1_1408_KI.pdf

Figure 12.2 – Moody's rating scale



Source: Moody's rating scale[84]

WaterNSW supports IPART's use of the financeability test and encourages IPART to ensure that its final determination supports an indicative credit rating that is 'investment grade' of **Baa1 or above**.

[84] Ibid. Page 1.

13 Proposed output measures

The following table provides WaterNSW's proposed output measures for the 2020-24 Determination period. The proposed output measures represent the major projects that WaterNSW is proposing to undertake during the 2020-24 Determination period and monitoring their progress will provide IPART and stakeholders with confidence in WaterNSW's delivery capability.

Table 13.1 – Proposed output measures for the 2020-24 Determination

Project	Output measure	Expected completion
Fitzroy Falls Dam Safety Upgrade	Completion of Stage 1 works, internal erosion interception trench	June 2022
Cataract Dam Safety Upgrade	Completion of Stage 1 works, installation of foundation relief drains and access ramp	June 2024
Cordeaux Dam Safety Upgrade	Completion of Stage 1 works, completion of foundation relief drain expansion and upgrade	June 2024
Warragamba Pipelines valves and controls upgrade	All valves in program installed and commissioned	June 2023
Avon Deep Water Storage	Practical completion of infrastructure that enables access to 'dead storage' of Avon Dam to the Illawarra Water Filtration Plant	June 2024
Dam Safety Telemetry	Automation and telemetry of relevant instrumentation for selected metropolitan sites listed under project	June 2024
Warragamba E-Flows	Commissioning and proving period commenced for Warragamba E-Flows to provide capability to release increased environmental flows from Warragamba Dam	December 2024

14 Other issues

14.1 Implementing the previous determination

WaterNSW has fully implemented the 2016-20 Determination.

From 1 July 2016, we have charged customers for determination services in accordance with the schedules in the 2016-20 Determination.

Maximum prices

In accordance with the 2016-20 Determination, WaterNSW has applied:

- Schedule 1. Methodology for fixing the maximum prices that WaterNSW can charge for large customers for determination services
- Schedule 2. Maximum prices that WaterNSW may charge Wingecarribee Shire Council, Shoalhaven City Council, and Goulburn Mulwaree Council for determination services
- Schedule 3. Maximum prices that WaterNSW may charge small customers for the supply of bulk raw water
- Schedule 4. Maximum prices that WaterNSW may charge small customers for the supply of unfiltered water.

We have reported against IPART's output measures as illustrated in Table 5.2. 'Activity against output measures 2018/19'

15 CEO Declaration

In accordance with the Guidelines for Water Agency Pricing Submissions, December 2017 (the Guidelines), of the Independent Pricing and Regulatory Tribunal of New South Wales, I declare that:

a) the information provided in our pricing submission submitted on 1 July 2019 is the best available information of the financial and operational affairs of WaterNSW and has been checked in accordance with the Guidelines; and

b) there are no circumstances of which I am aware that would render the information provided to be misleading or inaccurate.

Certified by the Chief Executive Officer:

[Original signed]

David Harris
Chief Executive Officer)

Dated

Glossary

ADWG	Australian Drinking Water Guideline
AEMC	Australian Energy Market Commission
AEMO	Australian Energy Market Operator
AER	Australian Energy Regulator
AIR	Annual Information Return
AMS	Asset Management System
ANCOLD	Australian National Committee on Large Dams
ATS	Approval To Spend
AWQIP	Annual Water Quality Incentive Payment
BAT	Burrawang to Avon Tunnel
CAPM	Capital Asset Pricing Model
CESS	Capital Expenditure Sharing Scheme
CIMS	Consolidated Information Management System
CMMS	Computerised Maintenance Management System
CPI	Consumer Price Index
CSR	Capture, Store and Release
CST	Cost of Shoalhaven Transfers
DDM	Dividend discount model
DNSP	Distribution Network Service Provider
DOI	Department of Industry – Water
DSC	Dam Safety Committee
DSMS	Dam Safety Management System
EAMS	Enterprise Asset Management System
ECM	Efficiency Carryover Mechanism
ERP	Enterprise Resource Planning
FFM	Fama-French model
FTE	Full-time equivalent
ICT	Information and Communications Technology
IPART	Independent Pricing and Regulatory Tribunal
LGRP	Local Government Reference Panel
ML	Megalitre
MoU	Memorandum of Understanding
MRP	Market Risk Premium
NEM	National Electricity Market
NER	National Electricity Rules
NPV	Net present value
NRAR	Natural Resources Access Regulator
NTER	National Tax Equivalent Regime
NSP	Network Service Provider (electricity)
OLS	Ordinary Least Squares
RAB	Regulatory Asset Base
RBA	Reserve Bank of Australia
RWQIP	Raw Water Quality Incentive Payment
RWSA	Raw Water Supply Agreement
SCA	Sydney Catchment Authority
SDP	Sydney Desalination Plant
SIR	Special Information Return
SLCAPM	Sharpe-Lintner Capital Asset Pricing Model
SMP	Statement of Monetary Policy
SWC	State Water Corporation
TR	Target Revenue
WAMC	Water Administration Ministerial Corporation
WACC	Weighted Average Cost of Capital

Appendix A – IPART Checklist

Pricing submission checklist	Provided?	Reference in Pricing Proposal
Summary and performance		
Executive summary	✓	Executive summary, Page 9
A separate plain English summary for customers	✓	Separately provided
Our role and functions	✓	Chapter 1
Our performance over the current regulatory period		
• Service levels	✓	Chapter 2
• Sales volumes and customer connections	✓	Chapter 10
• Historical operating expenditure (data presented in nominal $) ○ Totals or comparisons in real $ of the year stated in your SIP letter from IPART	✓ ✓	AIR (Tab 'Opex – GS', Table 4.1) Section 6.4
• Historical capital expenditure (data presented in nominal $) ○ Totals or comparisons in real $ of the year stated in your SIP letter from IPART	✓ ✓	AIR (Tab 'Capex – GS', Table 6.1), Section 5.1 Various, including Table 5.2
• Implementation of current determination under section18(5) of the IPART Act	✓	Section 14.1
Standards of service		
• Service levels (quantity, quality and scope) for next determination period	✓	Section 2.1.3
Key building block inputs		
Forecast operating expenditure		
• A business case for proposed operating expenditure	✓	Chapter 6 proposes operating expenditure allowance and provides justification for the projects, programs and level of operating expenditure

• Five years of future operating expenditure by service	✓	Section 6.6
• Operating expenditure in real $ of the year stated in IPART's SIP letter	✓	Section 6.6
• Drivers, justification and service levels	✓	Section 6.6
• Approach to allocating common or shared costs	✓	Section 6.5.2 and Attachment 4 – Cost allocation Manual
• Forecasting methodology, rationale and assumptions and risks	✓	Section 6.5
• Potential efficiency gains	✓	Section 6.7.8
Forecast and historical capital expenditure		
• A business case for proposed capital expenditure	✓	Attachment 3 contains a summary of project justifications for capital expenditure projects and programs. Full project justifications will be made available to IPART's technical consultants
• Five years of capital expenditure by service	✓	AIR (Tab "Capex – GS, Table 6.1)
• Long-term investment plan is provided (at least 10 years)	✓	Attachment 2 – '10 year Capital Investment Plan'
• Capital expenditure in real $ of the year stated in IPART's SIP letter	✓	Section 5.8, Table 5.4 AIR (Tab 'Capex – GS', Table 6.1)
• Drivers, justification and service levels	✓	Section 5.3
• Forecasting methodology, rationale and assumptions and risks	✓	Section 5.6
• Key assumptions underlying forecasts and identified risks	✓	Section 5.3
• The relationship between forecast capital expenditure and operating expenditure	✓	Section 5.7

Proposed Regulatory Asset Base (RAB), Weighted Average Cost of Capital (WACC), depreciation and asset lives		
• Total RAB for each year of the determination, RAB by service and/or service area and supporting calculations	✓	Section 7.3.5 (Table 7.1) and Section 7.4.3 (Table 7.5). AIR (Tab
• Proposed WACC, WACC components and supporting analysis	✓	Section 8
• Outline of proposed depreciation method	✓	Sections 7.3.3 and 7.4.2
• Historical and forecast cash capital contributions	NA	
• Proposed asset lives	✓	Section 7.4.2.1 and Section 7.4.2.2
Asset disposals		
• Asset disposals	✓	Sections 7.3 and 7.4.3
Working capital and tax allowances		
• Working capital allowances and supporting information	✓	Section 9.1
• Forecast tax depreciation with written explanation of estimation method	✓	Section 9.2
• Historical and forecast (non-cash) asset contributions	✓	Section 9.2.1
Forecast sales volumes and customer numbers		
Sales volumes		
• Sales volumes and methodology used to forecast sales	✓	Chapter 10
Customer numbers		
• Customer numbers by year and service	✓	Chapter 10
• Entitlement and licence numbers by year, water source and type (bulk water utilities)	NA	Not applicable for setting Greater Sydney prices.
Prices and impacts		
Proposed prices		
• Proposed tariffs for each service over the next five years (real $ of the year stated in SIP letter)	✓	Sections 12.1 to 12.3

Impacts of proposed prices		
• Indicative bill impacts in nominal $ over the next five years (can also provide in real $ and nominal $ in executive summary)	✓	Sections 12.14 to 12.15
• Transitional arrangements to manage or mitigate price changes	NA	
• Rebates and other measures to mitigate price impacts	NA	
• Other impacts and matters in section 15 of the IPART Act	NA	
• Analysis of affordability	✓	Sections 12.14 to 12.15
• Financial impacts on WaterNSW	✓	Section 12.16
Customer consultation		
• Details of customer engagement	✓	Chapter 3
Additional considerations		
Recycled water		
• Five years of capital and operating expenditure, avoided and deferred costs	NA	
• Evidence that costs are fully ring-fenced	NA	
• Any supporting evidence such as business cases for avoided or deferred costs	NA	
Unregulated costs and revenue		
• Ring-fencing of unregulated revenue and costs	✓	Unregulated costs separately identified in accordance with AIR reporting requirements, consistent with our CAM (Attachment 4, Section 4.3)
Finance and operating leases		
• Finance and operating leases treated in accordance with our policy	✓	Addressed in Section 6.5.4
• Accounting values for operating leases included in the SIR	✓	Included in 'Financial Data' worksheet in the SIR
Outstanding issues from the previous determination		

• Explanation of how outstanding issues have progressed with a summary of analysis in appendix	NA	
Elements of regulatory framework		
• Length of determination period	✓	Section 4.2
• Other issues e.g., form of regulation, measures to mitigate risk	✓	Sections 4.1, 4.3, 4.4, 4.5, 4.6, 4.7
Quality assurance requirements		
Quality assurance requirements and CEO's Declaration		
• QA check has been performed	✓	
• CEO's Declaration has been provided and signed	✓	Attached

Appendix B – Cost pass through event

WaterNSW proposes that IPART adopts a cost pass through framework that draws from elements in the National Electricity Market (NEM), incorporating:

- a regulatory change event
- a catastrophic event
- a Shoalhaven transfer event (not defined in this appendix).

Definitions for a '***regulatory change event'*** and a '***catastrophic event'*** are provided below and are adapted from the definitions in the National Electricity Rules (Chapter 10) for general pass through events and from the NSW DNSPs' regulatory determinations by the AER for nominated pass through events (as relevant)[85].

Regulatory change event

1. A change in a regulatory obligation or requirement that:

a) falls within no other category of pass through event; and

b) occurs during the course of a regulatory control period; and

c) substantially affects the manner in which WaterNSW provides regulated water services; and

d) materially increases or materially decreases the costs of providing those services.

and or

2. A legislative or administrative act or decision that:

a) has the effect of:

i. substantially varying, during the course of a regulatory period, the manner in which WaterNSW is required to provide a regulated service; or

ii. imposing, removing or varying, during the course of a regulatory control period, minimum service standards applicable to regulated water services; or

iii. altering, during the course of a regulatory control period, the nature or scope of regulated water services provided by WaterNSW; and

b) materially increases or materially decreases the costs to WaterNSW provider of providing regulated water services.

and or

3. A tax change event occurs if:

a) any of the following occurs during the course of a regulatory period for WaterNSW:

i. a change in a relevant tax, in the application or official interpretation of a relevant tax, in the rate of a relevant tax, or in the way a relevant tax is calculated;

ii. the removal of a relevant tax;

Catastrophic event

*1. A **natural disaster** pass through event:*

[85] AER DRAFT DECISION Ausgrid Distribution determination 2019−24 Attachment 14 – Pass through events. November 2018

In assessing a natural disaster event pass through application, the AER will have regard to, amongst other things:

a) Whether WaterNSW has insurance against the event,

b) The level of insurance that an efficient and prudent NSP would obtain in respect of the event,

c) Whether a relevant government authority has made a declaration that a natural disaster has occurred.

and or

2. ***Terrorism*** *pass through event*

Terrorism event means an act (including, but not limited to, the use of force or violence or the threat of force or violence of any person or group of persons (whether acting alone or on behalf of or in connection with any organisation or government), which:

a) From its nature or context is done for, or in connection with, political, religious, ideological, ethnic or similar purposes or reasons (including the intention to influence or intimidate any government and/or put the public, or any section of the public, in fear), and

b) Increases the costs to WaterNSW in providing regulated services.

Note: In assessing a terrorism event pass through application, IPART will have regard to, amongst other things:

a) Whether Ausgrid has insurance against the event,

b) The level of insurance that an efficient and prudent infrastructure service provider would obtain in respect of the event, and

c) Whether a declaration has been made by a relevant government authority that a terrorism event has occurred

Materiality threshold

IPART has previously applied a materiality threshold in its consideration of a pass through proposal as follows:

> *Any amount relating to a Positive Change Event if the average annual change in costs in respect of that event (as calculated in accordance with clause 2.2 of Annexure 1) does not exceed* ***1 per cent of the average annual smoothed revenue requirement*** *for the DNSP asset out in Annexure 12 of the Determination* (emphasis added).[86]

The NER addresses 'materiality' as follows:

> *For the purposes of the application of clause 6.6.1, an event results in a Distribution Network Service Provider incurring materially higher or materially lower costs if the change in costs (as opposed to the revenue impact) that the Distribution Network Service Provider has incurred and is likely to incur in any regulatory year of a regulatory control period, as a result of that event****, exceeds 1 per cent of the annual revenue requirement*** *for the Distribution Network Service Provider for that regulatory year* (emphasis added).[87]

To ensure that the cost pass through mechanism is only triggered in cases of material cost increases associated with external events, we propose a materiality threshold of **2.5%** of the annual revenue requirement, which would be in the order of a change in costs of approximately $5 million for Greater Sydney.

We note that this is higher than the 1% of the annual revenue requirement as previously applied by IPART when considering cost pass through applications.

[86] IPART Decision on Design, Reliability and Performance Licence Condition imposed on Distribution Network Service Providers by the Minister for Energy and Utilities dated 1st August 2005. Page 4.
[87] NER Chapter 10. See definition for 'materially'.

Appendix C - Major Projects – Confidential

Provided to IPART on a confidential basis.

Appendix D – Shoalhaven transfers formula

Following detailed review of the allowance, it has become evident that the pricing formula from the 2016-20 Determination does not include a number of specific charges that would normally be included in efficient retail charges for electricity, and which are reflected in the monthly electricity bill generated by a third party for WaterNSW under the Shoalhaven pumping scheme.

These charges are typically published and/or determined by an independent statutory authority or determined through the market, and hence WaterNSW is not able to influence the resulting costs in any way, as shown in Table D.1 below.

WaterNSW has also identified minor differences between IPART's calculation of the monthly average RRP and the RRP costs incurred by WaterNSW under its contract with our retailer.

Table D.1 – Additional retail charges for electricity and minor adjustments to IPART's formula for Shoalhaven transfers

Electricity charges	Description	Authority
Network charges	The Network Charges payable by WaterNSW under its contract with a third party for Network Services provided in respect of electricity supplied as part of the Scheme. Network Charges are reviewed by the AER for prudency and efficiency as part of a comprehensive price review and an annual approval process conducted by the AER. [88]	AER
Greenhouse gas abatement scheme costs	This cost category includes the carbon liabilities payable by WaterNSW under its contract with a third party in respect of electricity supplied as part of the Scheme. The liabilities arise through the implementation of Government schemes which impose additional costs on market participants in the electricity supply industry, of which a percentage of the cost is passed onto the end user. Such schemes aim to reduce, limit or manage levels of greenhouse gas emissions or increase the uptake of renewable electricity. For instance, the renewable energy target schemes administered by the Clean Energy Regulator for both large-scale and small-scale renewables. [89]	Market prices/Clean Energy Regulator
NEM fees	These are the fees for services provided for AEMO, as defined and calculated by AEMO including, but not limited to: • Frequency Control Ancillary Services; • Network Support and Control Ancillary Services;	AEMO

[88] For example, see the 2018-19 Pricing Proposal by Endeavour Energy https://www.aer.gov.au/system/files/AER%20Approved%20-%20Endeavour%20Energy%20annual%20pricing%20proposal%202018-19%20updated%20-%20May%202018.pdf

[89] http://www.cleanenergyregulator.gov.au/RET/About-the-Renewable-Energy-Target/How-the-scheme-works

Electricity charges	Description	Authority
	• System Restart Ancillary Services • NEM Variable Market fees, such as the Full Retail Contestability Fee, the National Transmission Planner Fee and other fees determined by published by AEMO in its annual schedule of charges[90]	
Transmission Losses	As advised by our retailer, the Transmission Losses is an uplift the $MWh to compensate for energy losses under the transmission and distribution network (where relevant). The transmission losses refer to the Marginal Loss Factor to the Kangaroo Valley 330kV Switching Station and the Burrawang 132kV substation, as published by AEMO.[91]	AEMO
NSW Regional Reference Price	The wholesale cost of generation payable by WaterNSW under its contract with a third party for the Scheme. The IPART formula calculates the RRP as the monthly average RRP (for each half hourly period) in off-peak pricing periods observed on weekdays. WaterNSW's contract with our retailer calculates the RRP as the monthly RRP in **all** off-peak periods, including all hours of the weekend and NEM holidays. Furthermore, each half hourly period is capped at one percent of the market price cap published by the AEMC for the relevant financial year.[92]	Market Price published by AEMO.

Source: WaterNSW analysis

Potential Revenue Impact

The matrix below quantifies the potential monthly cost impact to WaterNSW under assumed pumping volumes of up to 35,000ML per month. For example, if WaterNSW pumps 20,000 megalitres in a month where the observed IPART calculated RRP is $20 per MWh less than the total actual $/MWh incurred by WaterNSW, then WaterNSW would incur a revenue shortfall of approximately $784,000 for the month, as shown in Table D.2 below.

[90] Refer to https://www.aemo.com.au/-/media/Files/Electricity/NEM/Participant_Information/Fees/2018/Final-AEMO-Electricity-Final-Budget-and-Fees-2018-19.pdf
https://www.aemo.com.au/Electricity/National-Electricity-Market-NEM/Data/Ancillary-Services/Ancillary-Services-Payments-and-Recovery

[91] Refer to https://www.aemo.com.au/-/media/Files/Electricity/NEM/Security_and_Reliability/Loss_Factors_and_Regional_Boundaries/2018/Marginal-Loss-Factors-for-the-2018-19-Financial-Year.pdf

[92] Under the National Electricity Rules, the AEMC is required to adjust the market price cap and cumulative price threshold for the National electricity market, in line with the consumer price index, by 28 February. For example, https://www.aemc.gov.au/news-centre/media-releases/aemc-publishes-schedule-reliability-settings-2018-19

Table D.2 – Potential revenue impact of IPART's current formula for Shoalhaven transfers

ML transferred in a month	MWh	Differential $/MWh: Combined Small and Large Greenhouse factors and RRP Rate mismatch					
		$12 MWh	$14 MWh	16 MWh	20 MWh	25 MWh	30 MWh
0	0	$0	$0	$0	$0	$0	$0
5,000	9,800	$117,600	$137,200	$156,800	$196,000	$245,000	$294,000
10,000	19,600	$235,200	$274,400	$313,600	$392,000	$490,000	$588,000
15,000	29,400	$352,800	$411,600	$470,400	$588,000	$735,000	$882,000
20,000	39,200	$470,400	$548,800	$627,200	$784,000	$980,000	$1,176,000
25,000	49,000	$588,000	$686,000	$784,000	$980,000	$1,225,000	$1,470,000
30,000	58,800	$705,600	$823,200	$940,800	$1,176,000	$1,470,000	$1,764,000
35,000	68,600	$823,200	$960,400	$1,097,600	$1,372,000	$1,715,000	$2,058,000

Source: WaterNSW analysis

The quantum of the revenue shortfall will depend on:

- the expected mismatch between the RRP in the IPART pricing formula and the actual $MWh incurred by WaterNSW
- the actuals volumes pumped during the month.

The impact of the above charges being excluded from the current formula is significant. In one month alone when transfers occurred (December 2018), WaterNSW's costs exceeded IPART's allowance by over 20%, or $0.7 million. As shown in Table D.3 below, the $/MWh price differential between actual charges and the IPART determined charges is driving the revenue shortfall. The revenue shortfall is primarily attributed to the omission of greenhouse gas abatement costs (driving 66% of the difference), as well as the omission of ancillary charges, network charges, and network transmission loses.

Table D.3 Potential revenue impact of IPART's current formula for Shoalhaven transfers

Month	MLs under transfer	MWh	IPART $MWh price	Energy cost $MWh Price	$MWh Difference	Approx. Revenue shortfall
Dec-18	16,525ML	32,389 MWh	$67.210	$88.271	-$21.061	-$682,132
Jan-19	5,783ML	11,335 MWh	$80.290	$101.255	-$20.965	-$237,632
Feb-19	3,409ML	6,682 MWh	$75.780	$94.333	-$18.553	-$123,964
					FY19 Total Shortfall Actuals:	-$1,043,728
FY20	79,288ML*	155,405 MWh	N/A	N/A	-$20.467**	-$3,180,686
					Total Shortfall FY19 and FY20:	-$4,224,414

* Pumping volumes for FY20 are a sum of the monthly probabilistic pumping volumes derived from WaterNSW's drought depletion modelling using 10,000 replicates, starting from February 2019 at total starting storage level of 59.5%. WaterNSW expects pumping to be more intensive if Dam Levels drop to 35%.

** the FY20 $MWh differential was calculated by multiplying the relevant power percentage from December 2018 (Small and Large Scale) by the 50-percentile value of the monthly market price for greenhouse large and small certificates, as provided by our retailer, plus the latest NEM ancillary fees and loss factor allowances omitted from the IPART formula. Source: WaterNSW analysis

As demonstrated in Table D.3 above, WaterNSW expects that it would incur a shortfall of $4.2 million to 2019-20 based on a combination of the actual shortfall incurred to date by

WaterNSW in 2018-19 and probabilistic pumping modelling in 2019-20 for the Shoalhaven transfers. With funding costs, this equates to a shortfall of $4.4 million, which WaterNSW has disclosed in its pricing model to IPART.

Assuming the same price differential observed in December 2018, WaterNSW could incur a revenue shortfall of up to $1,372,000 per month (for 35,000 MLs pumped) in times when the Shoalhaven transfers scheme is activated, which could have significant financial implications for WaterNSW and promote perverse operating outcomes, unless IPART amends the current formula. WaterNSW proposes a 'shortfall levy' to recover the forecast revenue shortfall over the 2020-24 Determination period.

WaterNSW proposes that while a formula-based approach to calculating a price for Shoalhaven transfers is appropriate, the formula needs to be updated to include all required components of retail electricity charges.

The following section provides WaterNSW's proposed Cost of Shoalhaven Transfers (CST) formula, which includes additional factors for the following cost components:

- carbon liabilities
- NEM ancillary service fees
- NEM variable market fees
- network losses
- network charges
- a 'shortfall levy' adjustment

Calculating *Cost of Shoalhaven Transfers (CST)*

For the purposes of clause 3 of schedule 1, *CST* is the amount calculated using the following equation:

(RRP + CL + NEM Ancillary Service Fees + NEM Variable Market Fees) X MLF × (*1.96MWh/ML* × *STV) + Network Costs + Shortfall Levy*

Where:

(1) ***RRP*** is NSW regional reference price, averaged for the month, in $/MWh, as reported by the Australian Energy Market Operator for the relevant billing period for:

a. each 18 half-hourly period starting at 10:00pm and ending at 07:00am on working weekdays; and

b. each 48 half-hourly period for Saturday and Sunday and NEM holidays,

with each half hourly period capped at one percent of the market price cap published by the AEMC for the relevant financial year.

Explanatory Note: As of December 2018, the capped price for each half hourly period was $145 per MWh which is one per cent of the 'market price cap' of $14,500 per MWh reported by the AEMC in its 2018-19 Schedule of reliability Settings for 2018-19. For more information see https://www.aemc.gov.au/news-centre/media-releases/aemc-publishes-schedule-reliability-settings-2018-19

Note: AEMO publishes the regional reference price on its website. See http://nemweb.com.au/#public-prices and https://www.aemo.com.au/Electricity/National-Electricity-Market-NEM/Data-dashboard, filtered by region 'NSW1'

(2) ***STV*** (Shoalhaven transfer value) is the number of ML calculated in accordance with clause 5 of schedule 1.

(3) **CL** is the Carbon Liabilities arising from obligations imposed on the Shoalhaven Transfers Assets Owner under Law with respect to the Shoalhaven Transfers, the costs of which are typically passed on by generators to retailers (or direct customers) or by retailers to customers in New South Wales for the purpose of reducing, limiting or managing levels of greenhouse gas emissions (including energy efficiency, energy savings, emissions trading or emissions offset schemes) or for increase the uptake of renewable electricity, including but not limited to the sum of charges relating to:

(a) ***LSRECC*** is the Large Scale Renewable Energy Certificates Charge calculated as follows:

(i) **RPP** X **Cost of Acquiring Large Scale Certificates**, where

RPP is the renewable power percentage published by the Clean Energy Regulator for the relevant financial year.

Explanatory Note: As of December 2018, the renewable power percentage was 16.06%as reported by the Clean Energy Regulator. For more information see http://www.cleanenergyregulator.gov.au/RET/Scheme-participants-and-industry/the-renewable-power-percentage

(4) **Cost of Acquiring Large Scale Certificates** is the monthly average daily closing price of Large-Scale Certificates acquired under the *Renewable Energy (Electricity) Act 2000* and associated regulations as amended from time to time representing the cost of acquiring Large Scale Certificates by the Shoalhaven Transfers Asset Owner for the electricity generated in respect of the Shoalhaven Transfers over the relevant billing period as determined by the Asset Owner.

Explanatory Note: As of December 2018, the price quoted by the Shoalhaven Transfers Assets Owner was $48 per certificate

(a) ***SSRECC*** is the Small Scale Renewable Energy Certificates Charge, where

(i) STP X Cost of Acquiring Small Scale Certificates, where

STP is the small-scale technology percentage published by the Clean Energy Regulator

Explanatory Note: As of December 2018, the renewable power percentage was 17.08%as reported by the Clean Energy Regulator. For more information see http://www.cleanenergyregulator.gov.au/RET/Scheme-participants-and-industry/the-small-scale-technology-percentage

(5) **Cost of Acquiring Small Scale Certificates** is the monthly average daily closing price of Small-Scale Certificates (under the Small-scale Renewable Energy Scheme administered by the Clean Energy Regulator), representing the cost of acquiring Small-Scale Certificates by the Shoalhaven Transfers Asset Owner for the electricity generated in respect of the Shoalhaven Transfers over the relevant billing period as determined by the Asset Owner.

Explanatory Note: As of December 2018, the price quoted by the Shoalhaven Transfers Assets Owner was $36.6 per certificate

(6) ***NEM Ancillary Services Fees*** is the Ancillary Services Fees for the relevant financial for ancillary services provided for AEMO, as defined and calculated in accordance with AEMO's guidelines on payment and recovery of ancillary services, including, but not limited to:

- Frequency Control Ancillary Services;
- Network Support and Control Ancillary Services;
- System Restart Ancillary Services

Explanatory Note: AEMO publish guidelines describing the methodology for recovering the cost of ancillary services. See https://www.aemo.com.au/-/media/Files/PDF/SETTLEMENTS-GUIDE-TO-ANCILLARY-SERVICES-PAYMENT-AND-RECOVERY-V2.pdf

Explanatory Note: As of December 2018, this fee represented the electricity volumes weighted average for each weekly period of NSW Ancillary Services Recovery amounts determined by AEMO for the year prior to the relevant financial year, as determined by the Shoalhaven Transfers Asset Owner

The Ancillary Services Recovery Amounts are published by AEMO, See https://www.aemo.com.au/Electricity/National-Electricity-Market-NEM/Data/Ancillary-Services/Ancillary-Services-Payments-and-Recovery, 'As Recovery Summary File', filtered by 'NSW1', with the variables in 'RECOVERY_RATE_CUSTOMER weighted by the variables in 'ENERGY_CUSTOMER)

(7) ***NEM Variable Market Fees*** is the NEM Fee, Full Retail Contestability Fee, the National Transmission Planner fee, and any other fee determined and published by AEMO in its annual schedule of charges for the relevant financial year which seek to recover a share of the cost of administering the National Electricity Market, as determined by the Shoalhaven Transfer Asset Owners.

Explanatory Note: the AEMO fees are published by AEMO in its annual consolidated budget, along with a schedule of fees . For more information See https://www.aemo.com.au/-/media/Files/Electricity/NEM/Participant_Information/Fees/2018/Final-AEMO-Electricity-Final-Budget-and-Fees-2018-19.pdf

Explanatory Note: As of December 2018, this fee included the NEM fee of ($0.44 MWh), Full Retail Contestability (FRC) fee ($0.077 MWh) and the National Transmission Planner (NTP) fee ($0.02339 MWh) weighted by the nominal load of 8MW at the Burrawang stations for balanced water flow For example ($0.44 MWh + $0.077MWH + $0.02339MWh) X 8 MW nominal load at Burrawang Station / 208 MW of total nominal load at both Burrawang Station and Kangaroo Valley/Bendeela substation/switching stations

(8) ***MLF*** (Marginal Loss Factor) is calculated as follows:

(8 X **MLF (Kangaroo Valley)** + 200 X **MLF (Marulan)**)/208, where

MLF (Kangaroo Valley) refers to the Marginal Loss Factor to the Kangaroo Valley 330kV Switching Station, as published by AEMO for the relevant financial year.

(a) Explanatory Note: As of December 2018, the Marginal Loss Factor to the Kangaroo Valley 330kV Switching Station referred to the MLF of 1.0137 published by AEMO in its *Regionals and Marginal Loss Factors: FY2018-19 Report* for the *Kangaroo Valley (Shoalhaven) Pumps – Dual MLF*. For more information, see https://www.aemo.com.au/-/media/Files/Electricity/NEM/Security_and_Reliability/Loss_Factors_and_Regional_Boundaries/2018/Marginal-Loss-Factors-for-the-2018-19-Financial-Year.pdf.

MLF (Marulan) refers to the Marginal Loss Factor to Burrawang 132kV substation, as published by AEMO for the relevant financial year.

Explanatory Note: As of December 2018, the Marginal Loss Factor to the Burrawang 132kV substation referred to the MLF of 0.9977 published by AEMO in its *Regionals and Marginal Loss Factors: FY2018-19 Report* for the *Marulan (Endeavour Energy)*. For more information, see https://www.aemo.com.au/-/media/Files/Electricity/NEM/Security_and_Reliability/Loss_Factors_and_Regional_Boundaries/2018/Marginal-Loss-Factors-for-the-2018-19-Financial-Year.pdf.

(9) ***Network Costs*** means the network charges, fees or tariffs approved by the AER and paid on either a per megawatt hour or a fixed basis by WaterNSW to a Network Provider in respect of electricity supplied for the Shoalhaven Transfers.

(a) Explanatory Note: As of December 2018, Network Costs included, but were not limited to, Network Access Charges, Peak Energy Charges, Shoulder Energy Charges, Off-peak Energy Charges, High Season Peak Demand Charges and Low Season Peak Demand Charges for periods of peak, off-peak and shoulder, as specified in table 5.14 of the 2018-19 Endeavour Energy Pricing Proposal approved by the Australian Energy Regulator. Respective electricity usage was recorded at NMI NEEE000757. The Network Costs incorporated any relevant Marginal Loss Factors and Distribution Loss Factors approved by AEMO which applied to the electricity transmitted through Endeavour Energy's Distribution Network. For more information, see https://www.aer.gov.au/system/files/AER%20Approved%20-%20Endeavour%20Energy%20annual%20pricing%20proposal%202018-19%20updated%20-%20May%202018.pdf

(10) ***Shortfall Levy*** applies when the STV is greater than nil for the relevant month and means the lesser of

a. $250,000; and

b. the shortfall balance, where;

I. $4,435,749 is the starting shortfall balance as at 1 July 2020; minus

II. The sum of contributions made to the balance since 1 July 2020 under this clause (where relevant); plus

III. efficiency funding costs which accrues at the end of each regulatory year of the determination period and which is calculated by multiplying the Post Tax Nominal WACC by the residual shortfall balance (calculated by taking the difference of the figure derived in clause 7 b. I. (above) from clause b. II. (above)

Calculating *Shoalhaven Transfer Value (STV)*

For the purposes of clause 4 of schedule 1, *STV* is the amount calculated using the following equation:

$(HP_1 \times 54.5ML/hour) + (HP_2 \times 104.6ML/hour)$

where:

(1) HP_1 is total number of hours in the month metered at the Burrawang Pumping Station, Meter No 4507 labelled "Any 1 Pump Only"; and

(2) HP_2 is total number of hours in the month metered at the Burrawang Pumping Station, Meter No 4508 labelled "Any 2 Pumps Together".

Appendix E – Operating Licence Compliance

WaterNSW operates in accordance with its operating licence granted under section 11 of the WaterNSW Act. WaterNSW's operating licence changed from 1 July 2017.

For the first year of the 2016-20 Determination, the prior operating licence was in effect, "*Sydney Catchment Authority Operating Licence 2012-2017*" (SCA OL). However, from 1 July 2017, for the second year and future years of the Greater Sydney Determination, the "*WaterNSW Operating Licence 2017-2022*" (WNSW OL) is in effect. The WNSW OL combined the SCA OL and the "*State Water Corporation Operating Licence 2013-2018*" reflecting the merger of the two organisations.

The change in operating licence ensured similar obligations but with slight differences in wording and scope which produced interpretation variances from the previous licence conditions.

In addition, a substantial change occurred to the way IPART would audit compliance with the operating licence provisions. On 4 June 2018, IPART published its "*Audit Guideline, Public Water Utilities*". IPART made the following major changes to the audit guideline:

- Amended the audit grades by reducing the number of compliant grades from three to two, and amended the definitions to more closely align with IPART's audit grades for energy networks and private water utilities i.e. WIC Act licensees;
- Amended IPART's guidance on how it will audit various management systems;
- Clarified the process regarding the auditing of water quality clauses with requirements for the Australian Drinking Water Guidelines (ADWG) and Australian Guidelines for Water Recycling (AGWR), including auditing of individual elements within the ADWG and AGWR;
- Clarified IPART's guidance on the provision of evidence outside the audit period;
- Clarified IPART's guidance on how to deal with matters outside the audit scope during the audit; and
- Adjusted the audit schedule to respond to feedback from public water utilities regarding resourcing constraints at particular steps in the audit process.

2017 Audit Results

For the first year of 2016-20 Determination, under the SCA OL and the prior IPART audit guidelines, WaterNSW's operating licence audit results are set out in IPART's "*WaterNSW Operational Audit 2016-17, Report to the Minister*", December 2017 (2017 Audit Report).

A summary of the audit grades applicable for the 2017 Audit Report is set out in Figure 2.1 below, see page 36 of the 2017 Audit Report.

Figure E.1 – Audit Grades, 2017 Audit Report

Compliance grades for public utilities

Grades of compliance	Description
Full Compliance	Sufficient evidence to confirm that the requirements have been fully met.
High Compliance	Sufficient evidence to confirm that the requirements have generally been met apart from **very few minor shortcomings** which do not compromise the ability of the utility to achieve defined objectives or assure controlled processes, products or outcomes.
Adequate Compliance	Sufficient evidence to confirm that the requirements have generally been met apart from **a number of minor shortcomings** which do not compromise the ability of the utility to achieve defined objectives or assure controlled processes, products or outcomes
Non compliant	Sufficient evidence has **not** been provided to confirm that all major requirements are being met and the deficiency adversely impacts the ability of the utility to achieve defined objectives or assure controlled processes, products or outcomes.
No Requirement	The requirement to comply with the licence condition does not occur within the audit period or there is no requirement for the utility to meet this assessment criterion.

Source: 2017 Audit Report, Page 36.

The audit determined full compliance with the operating licence clauses other than clause 2.1.2 where high compliance was determined. These results are summarised below, together with prior year audit report results.

Table E.1 below from sets out the audit results for water quality.

Table E.1 – 2017 Audit Report, Water Quality

Clause	Requirement	Compliance grading				
2	**Water Quality**	**2012-13[a]**	**2013-14[a]**	**2014-15[a]**	**2015-16[a]**	**2016-17**
2.1.1	Maintaining a WQMS	High	High	High	High	Full
2.1.2	Implementing the WQMS	High	High	Full	Full	High

Source: 2017 Audit Report, Page 24.

IPART made three recommendations in relation to the clause 2.1.2:

- By 30 June 2018, WaterNSW repairs or replaces the failed Nepean Reservoir mixer;
- By 30 June 2018, WaterNSW undertakes a risk assessment to determine appropriate strategies and controls to address any current reliability concerns or potential failure of all such mixer or aerator assets within its portfolio; and
- By 31 December 2018, WaterNSW implements appropriate strategies and controls to address any reliability concerns or potential failure of all such mixer or aerator assets within its portfolio.

The first recommendation in relation to the Nepean Reservoir mixer is complete. The second recommendation was found to be partially complete[93] in the 2018 Audit Report with the third recommendation noted as continuing[94]. However, following the 2018 Audit Report, WaterNSW immediately reviewed and finalised the operation and maintenance documentation for the new mixer.

Table E.2 below from page 26 of the 2017 Audit Report sets out the audit results for water supply sufficiency.

Table E.2 – 2017 Audit Report – Water Supply Sufficiency

Clause	Requirement	Compliance grading				
3	**Water Supply Sufficiency**	**2012-13[a]**	**2013-14[a]**	**2014-15[a]**	**2015-16[a]**	**2016-17**
3.1.1	Catchment infrastructure management	Full	Full	Full	Full	Full

Source: 2017 Audit Report, Page 26.

Table E.3 below from page 27 of the 2017 Audit Report sets out the audit results for catchment management.

Table E.3 – 2017 Audit Report – Catchment management

Clause	Requirement	Compliance grading				
4	**Catchment**	**2012-13[a]**	**2013-14[a]**	**2014-15[a]**	**2015-16[a]**	**2016-17**
4.1.1	Catchment management	Full	Full	Full	Full	Full

Source: 2017 Audit Report, Page 27.

Table E.4 below from page 28 of the 2017 Audit Report sets out the audit results for developing and implementing an asset management system.

Table E.4 – 2017 Audit Report – Asset Management System

Clause	Requirement	Compliance grading				
5	**Assets**	**2012-13[a]**	**2013-14[a]**	**2014-15[a]**	**2015-16[a]**	**2016-17**
5.1.1	Develop an Asset Management System	No Requirement	No Requirement	-	Non-Compliant	Full
5.1.2	Implement an Asset Management System	No Requirement	No Requirement	No Requirement	Non-Compliant	Full

Source: 2017 Audit Report, Page 28.

Table E.5 below from page 30 of the 2017 Audit Report sets out the audit results for developing and implementing an environmental management system.

[93] WaterNSW needs to fully document appropriate strategies and controls for managing the risks.
[94] Is dependent on completion of the previous recommendation.

Table E.5 – 2017 Audit Report – Environmental Management System

Clause	Requirement	Compliance grading				
7	**Environment**	**2012-13[a]**	**2013-14[a]**	**2014-15[a]**	**2015-16[a]**	**2016-17**
7.1.1	Developing an EMS	No Requirement	No Requirement	-	Non-Compliant	Full
7.1.2	Implementing the EMS by 1 July 2015	No Requirement	No Requirement	No Requirement	Non-Compliant	Full
7.1.3	Certifying the EMS by 30 June 2017	-	-	-	-	Full
7.1.4	Maintaining programs to manage risks	Full	Full	No Requirement	Full	Full

Source: 2017 Audit Report, Page 30.

2018 Audit Results

For the second year of 2016-20 Determination, under the WNSW OL and the new IPART audit guidelines, WaterNSW's operating licence audit results are set out in IPART's "*WaterNSW Operational Audit 2018, Report to the Minister*", February 2019 (2018 Audit Report).

A summary of the audit grades applicable for the 2018 Audit Report is set out in Figure 2.2 below, see page 48 of the 2018 Audit Report.

Figure E.2 – Audit Grades, 2018 Audit Report

Table A.1 Current compliance grades

Grades of compliance	Description
Compliant	Sufficient evidence is available to confirm that the requirements have been met.
Compliant (minor shortcomings)	Sufficient evidence is available to confirm that the requirements have been met apart from **minor shortcomings** which to date have not compromised the ability of the utility to achieve defined objectives or assure controlled processes, products or outcomes.
Non-compliant (non-material)	Sufficient evidence is not available to confirm that the requirements have been met and the **deficiency does not adversely impact** the ability of the utility to achieve defined objectives or assure controlled processes, products or outcomes.
Non-compliant (material)	Sufficient evidence is not available to confirm the requirements have been met and the **deficiency does adversely impact** the ability of the utility to achieve defined objectives or assure controlled processes, products or outcomes.
No Requirement	There is no requirement for the utility to meet this criterion within the audit period.

Source: IPART Audit Guideline Public Water Utilities, September 2018, Figure 2.1.

The audit determined a number of compliance shortfalls with the operating licence clauses. These results are summarised below (they exclude those WNSW OL clauses which are not relevant to Greater Sydney).

Table E.6 below sets out the results contained in the 2018 Audit Report.

Table E.6 – 2018 Audit Report results

Clause	Requirement	Compliance Grading 2017-18
2.1	Water Quality Management System	
2.1.1	Maintain a WQMS	Non-compliant (Material)
2.1.2	With respect to Declared Catchment Areas, maintain a WQMS consistent with the licence	Non-compliant (Material)
2.1.3	With respect to Non-Declared Catchment Areas from which WaterNSW Supplies water maintain WQMS consistent with the licence	Non-compliant (Material)
2.1.4	Implement relevant WQMS and carry out all relevant activities in accordance with the WQMS and to the satisfaction of NSW Health	Compliant (Minor shortcomings)
2.1.5	Notify IPART and NSW Health of any significant changes proposed to be made to a WQMS	Compliant
2.2	Catchment management	
2.2.1	Manage and protect the Declared Catchment Areas in a manner consistent with WaterNSW's objectives and functions under the Act, and the WQMS, AMS and the EMS required under the licence	Non-compliant (Non-material)
2.4	Catchment Infrastructure Works Management	
2.4.1	Ensure that in Declared Catchment Areas, the Catchment Infrastructure Works are operated and managed consistently with the Design Criteria and the AMS referred to in the licence.	Non-compliant (Non-material)
2.8	Research on catchments	
2.8.1	Maintain a program of research for each Declared Catchment Area, consistent with the requirements of this clause.	Compliant (Minor shortcomings)
2.8.2	Report on research programs referred to in clause 2.8.1 of the licence	Compliant
3.1	Construct, maintain and operate Water Management Works	
3.1.1	Construct, maintain and operate Water Management Works in accordance with the AMS	Non-compliant (Non-material)
3.2.1	Ensure that any water Supplied to Customers is in accordance with a relevant Customer Supply Agreement, and any relevant arrangements with Sydney Water	Compliant (Minor shortcomings)
4.2	Water Supplied Performance Standards	
4.2.2	Manage the quality of water Supplied to Customers in accordance with the WQMS	Compliant
4.2.3	Manage service interruptions in accordance with the AMS	Non-compliant (Material)
5.1	Asset Management Systems	
5.1.1	Maintain an AMS at all times consistent with the requirements of the licence	Non-compliant (Material)
5.1.2	Implement the AMS and carry out all relevant activities in accordance with the AMS	Non-compliant (Non-material)
6.1	Customer Supply Agreements – Customers other than Sydney Water	
6.1.1	Establish and maintain agreements within WaterNSW's Customers to whom it Supplies water (except Sydney Water), which must set out the terms and conditions for the Supply of water (Customer Supply Agreements)	Non-compliant (Non-material)
6.1.2	Only Supply water to these Customers in accordance with the terms and conditions of these Customer Supply Agreements	Non-compliant (Material)
6.1.3	Terms and conditions of the Customer Supply Agreements must, at a minimum, include provisions in this clause	Non-compliant (Non-material)
6.3	Water metering and monitoring	
6.3.1	Determine the volume of water Extracted by, or Supplied to each Customer, at least annually, for the purpose of accurate account management, billing and reporting	Non-compliant (Material)
6.3.2	Prior to operating, replacing, repairing, maintaining, removing, connecting, disconnecting or otherwise modifying Metering Equipment WaterNSW does not own, it must obtain the agreement of the owner of that equipment.	Compliant (Minor shortcomings)
6.5	Customer Advisory Groups	
6.5.1	Establish and maintain area-based advisory groups representing a broad cross-section of its Customers for those areas	Compliant

6.5.2	Regulatory consult with the area-based Customer Advisory Groups to enable Customer involvement in issues relevant to the performance of WaterNSW's obligations to Customers under the licence or the Customer Service Charter, obtain advice on the interests of WaterNSW's Customers and such other key issues relating to WaterNSW's planning and operations as WaterNSW may determine consistent with the Customer Advisory Group Charter(s).	Compliant
6.5.3	Ensure that, at all times, the membership of each Customer Advisory Group is appointed and determined by WaterNSW in accordance with the Customer Advisory Group Charter	Compliant (Minor shortcomings)
6.5.4	Use its best endeavours to ensure that membership of each Customer Advisory Group includes customers from the groups specified in the licence as may be relevant to that Customer Advisory Group.	Compliant (Minor shortcomings)
6.5.5	Provide Customer Advisory Groups with adequate Information to discharge the tasks assigned to them, except confidential information	Compliant
6.8	Code of Practice on Payment Difficulties	
6.8.1	Maintain and fully implement a code of practice that assist Customers experiencing financial hardship to better manage their current and future Bills (Code of Practice on Payment Difficulties)	Compliant
6.8.2	Code of Practice on Payment Difficulties must provide a payment plan for Customers and include relevant procedures described in the licence	Non-compliant (Non-material)
6.8.3	Set out details of the Code of Practice on Payment Difficulties in the Customer Service Charter, or, where a Customer Supply Agreement is established in respect of a Customer, in that Customer Supply Agreement	Non-compliant (Non-material)
6.8.4	Provide, free of charge, information on the Code of Practice on Payment Difficulties to Customers, except Sydney Water, as specified in the licence, and on its website.	Compliant (Minor shortcomings)
6.9	Internal Complaints Handling Procedure	
6.9.1	Maintain a procedure for receiving, responding to and resolving Complaints, which is consistent with the *Australian Standard AS/NZS 10002:2014: Guidelines for complaints management in organizations (AS/NZS 10002:2014)* or other standard approved by IPART (Internal Complaints Handling Procedure)	Non-compliant (Non-material)
6.9.2	Fully implement the Internal Complaints Handling Procedure and carry out all relevant activities in accordance with Internal Complaints Handling Procedure.	Compliant
6.9.3	Provide information to Customers concerning internal complaints handling, at least annually with Bills.	Compliant
6.9.4	Make information concerning internal Complaints handling available to any person, free of charge, on the WaterNSW website	Compliant
6.15	Memorandum of Understanding with Department of Planning and Environment	
6.15.1	WaterNSW must use its best endeavours to establish and maintain a memorandum of understanding with the Department of Planning and Environment; and comply with the memorandum of understating maintained under clause 6.15.1(a)	Compliant
6.16	Roles and Responsibilities with Department of Primary Industries Water	
6.16.1	Agree in writing with the Department of Primary Industries Water the roles and responsibilities regarding the conduct of Conferred Functions specified in Schedule A of the Licence and comply with the agreement	Compliant
6.16.2	By 30 June 2018, Water NSW must publish on its website, for downloading by any person, a statement setting out the roles and responsibilities required under clause 6.16.1(a)	Compliant (Minor shortcomings)

Source: 2018 Audit Report.

The non-compliances in Table 2.6 are discussed in the sections below.

Water Quality Management System

In relation to clause 2.1.1, a material non-compliance was found in relation to the documentation of the WQMS, however, importantly, IPART noted at page 16 of the 2018 Audit Report:

> "*Our auditors did not identify any instances where these deficiencies had resulted in impacts on water quality, either within or outside the declared catchment areas, to any of the categories of water supplied by WaterNSW*."

IPART's recommended actions at page 16 of the 2018 Audit Report were as follows:

- By 30 September 2019, WaterNSW should review and amend its Water Quality Management System to ensure that each water category covered by the WQMS addresses each element, component and activity of the Australian Drinking Water Guidelines framework;
- By 30 September 2019, WaterNSW should document its procedures and process to manage materials and chemicals used in its system where the water is supplied for a drinking water end-use; and
- By 31 December 2019, WaterNSW should review the operational and process control procedures underpinning its Water Quality Management System and:
    - Identify the required operational procedures from catchment to consumer for processes and activities under its control;
    - Develop a plan to compile this information;
    - Commence implementation of the plan and document operational procedures for all processes and activities (e.g., preventive measures, operational monitoring and verification procedures and maintenance requirements); and
    - Commence staff training to ensure staff are trained and proficient to implement the new operational procedures.

Following the audit report findings, WaterNSW took immediate action and has now established documented procedures for evaluation of chemicals, materials and suppliers. Changes have been made to the procurement framework and supporting documentation to prevent the purchase of inappropriate materials and chemicals for use in contact with water intended for drinking water supply. All other relevant operational procedures are being checked for completeness and currency.

In relation to clause 2.1.2, IPART noted at page 17 of its 2018 Audit Report:

> *"WaterNSW's WQMS lacked documentation associated with material and chemicals selection and evaluation, which is inconsistent with the ADWG. Further, it was unclear which operational and process control procedures underpinned the WQMS, also inconsistent with ADWG. Our auditor also noted a number of inconsistencies with the ADWG for the Declared Catchment Area risk assessments."*

The recommended action at page 17 of the 2018 Audit Report is as follows:

- By 31 December 2019, WaterNSW should review the manner in which it conducts all water utility risk assessments to ensure it meets the requirements of elements 2 and 3 of the ADWG framework and the licence obligation.

In relation to clause 2.1.3, IPART noted at page 18:

> *Our auditor noted that WaterNSW's WQMS did not reference the Oberon catchment. The WQMS is required under the ADWG to cover Non-Declared Catchment Areas from which WaterNSW supplies water, which includes the Oberon catchment. As with the Declared Catchment Areas (clause 2.1.2), our auditor also identified a number of inconsistencies with the ADWG for the risk assessments for the Non-Declared Catchment Areas.*

IPART did not make a specific recommendation in relation to clause 2.1.3. However, immediately following the 2018 Audit Report WaterNSW added further details regarding the Oberon Catchment to the WQMS.

In relation to clause 2.2.1, IPART noted at page 19:

> *"As the staff and executive of WaterNSW did not identify the performance requirements and outcomes for Declared Catchment Areas in the AMS, WaterNSW did not manage and protect the Declared Catchment Areas in accordance with the AMS required under 5.1.1. Our auditor therefore assigned a non-compliant grade with this clause. However, our auditor considers that the non-compliance is non-material because WaterNSW managed its assets using policies, processes, documentation and knowledge from the former Sydney Catchment Authority which we consider were adequate even though they were outside the AMS."*

No specific recommendations were made in relation to clause 2.2.1.

In relation to clause 2.4.1, IPART noted at page 20:

> *"In our auditor's view 'the AMS referred to in clause 5.1' means WaterNSW is required to manage service interruptions with an AMS consistent with AS ISO 55001:2014. To be consistent with AS ISO 55001:2014, WaterNSW is required to understand the needs of stakeholders, and include these and the Design Criteria in the system requirements and objectives of the AMS. WaterNSW's AMS did not include Design Criteria or stakeholder expectations relating to water supply security, robustness and reliability as system requirements or AMS objectives.*
>
> *Our auditor noted that WaterNSW used Asset Class Standards for specifying planning guidelines and asset requirements for related assets or infrastructure works. While WaterNSW's documentation noted that Asset Class Standards are a key planning tool, the standards did not exist for most catchment infrastructure works including dams, pumping stations, canals and tunnels, dosing facilities and control systems, which is inconsistent with AS ISO 55001:2014. Consequently, WaterNSW did not manage its infrastructure works consistently with the Design Criteria and the AMS.*
>
> *However, we consider the non-compliance is non-material because there are other controls and processes in place to manage the impacts of the deficiencies identified by our auditor. The controls and processes include operational plans, operating rules and flow schedules, many of which were in use by the previous Sydney Catchment Authority."*

No specific recommendations were made in relation to clause 2.4.1. However, immediately following the 2018 Audit Report WaterNSW amended and expanded the relevant stakeholders and their requirements within the AMS system manual (Strategic Asset Management Plan) and amended the AMS scope to include all functions under the Licence to provide greater integration with the WQMS.

Bulk Water Storage and Transmission

In relation to clause 3.1.1, IPART noted at pages 22 and 23:

> *"In our auditor's view 'the AMS referred to in clause 5.1' means that WaterNSW is required to construct, maintain and operate its Water Management Works in accordance with an AMS consistent with AS ISO 55001:2014. To be consistent with AS ISO 55001:2014, WaterNSW must:*

- *specify appropriate planning guidelines and requirements for related assets in Asset Class Standards in the AMS, and*
- *document the objectives of the Asset Class Standards and other technical knowledge in the AMS.*

…

Our auditor considers this is a non-material non-compliance because WaterNSW showed evidence of understanding its asset management objectives and was managing risks according to these objectives. Further, WaterNSW showed evidence of managing its assets reasonably and in accordance with processes and knowledge from the previous Sydney Catchment Authority and State Water Corporation."

Performance Standards

In relation to clause 4.2.3, IPART noted at page 25:

> *"This clause is non-compliant because WaterNSW has not set clear objectives to manage service interruptions. This means WaterNSW has not managed service interruptions in accordance with the AMS required under 5.1.1."*

IPART did not make any specific recommendation in relation to this clause, however, noted that compliance with this clause will be achieved or improved if recommendation 6 for clause 5.1 is implemented (see below).

Organisational Systems Management

In relation to clause 5.1.1, IPART noted at page 26:

> *The licence requires WaterNSW's AMS, consistent with AS ISO 55001:2014, to cover WaterNSW's authorised functions. WaterNSW's AMS covered WaterNSW's physical assets but not all of its authorised functions as required under clause 5.1.1 of the licence. This deficiency results in a non-compliance.*
>
> *In addition, reflecting the licence requirements within the scope of the AMS is required by AS ISO 55001:2014.[24] Further, the audit of other areas of the licence identified that the AMS was deficient and lacked defined outcomes for the following:*
>
> - *Managing catchment infrastructure works and water management works (identified in the audit of clause 2.2.1 and 3.1.1).*
> - *Design criteria for security, robustness and reliability of water available for customers (identified in the audit of clause 2.4.1).*
> - *Supply interruptions (identified in the audit of clause 4.2.3).*
>
> *We consider that the deficiencies in WaterNSW's AMS are material because the AMS plays a key role in meeting a water utility's overall system performance. The AMS is crucial for planning for, managing and responding to, issues that may pose a significant risk to asset integrity and/or public health. As WaterNSW's AMS does not include all of its authorised functions and did not specify all the expected defined outcomes, this could impact on management of its assets including that the assets may not deliver the expected levels of service at minimum lifecycle cost.*

IPART made the following recommendation in relation to clause 5.1.1 at pages 26 and 27 of the 2018 Audit Report:

> *By 31 December 2019, WaterNSW should revise the Asset Management System to ensure it is consistent with clause 5.1.1 in particular:*

- *the scope accurately reflects the licence requirements including the Design Criteria, and related requirements for water supply security, robustness and reliability are adequately incorporated within the system*
- *the correct stakeholders have been identified and that stakeholder requirements including those relating to supply interruptions are reflected*
- *identify whether any elements of the Asset Management System do not meet the requirements and intent of the Strategic Asset Management Plan and if found, make a plan to revise the relevant elements to ensure that the Asset Management System meets the requirements and intent of the Strategic Asset Management Plan*
- *revise the Fish River Water Supply Scheme Incident Management Plan so that it reflects stakeholder requirements, and*
- *identify if any other processes or documents for managing supply interruptions should be revised to meet stakeholder requirements and develop a plan and timeframe for revising these processes and documents.*

As noted above, immediately following the 2018 Audit Report WaterNSW amended and expanded the relevant stakeholders and their requirements within the AMS system manual (Strategic Asset Management Plan) and amended the AMS scope to include all functions under the Licence to provide greater integration with the WQMS.

Customer and stakeholder relations

In relation to clause 6.1.2, IPART noted at page 33:

> *"The auditor identified two deficiencies with WaterNSW's compliance with this clause. With respect to one large Customer Supply Agreement for Wingecarribee Council our auditor noted a deficiency as WaterNSW did not report water quality to Wingecarribee Council (a required under its Customer Supply Agreement) as the level of water quality reporting to Wingecarribee Council is currently beyond the sampling and monitoring capability of the supply system. The identified deficiency was described as 'administrative', however our auditor considered that this deficiency is material as it could result in water being used in ways for which it is not intended, creating a risk to the end user.*
>
> *The second deficiency was with respect to Fish River Customer Supply Agreements which state that WaterNSW monitors customer complaints to ensure it is meeting its obligations, however the lack of a water quality category of complaint made it difficult to demonstrate evidence with respect to water quality aspects of its obligations".*

IPART made the following recommendation in relation to clause 6.1.2 at page 33 of the 2018 Audit Report:

> *"By 1 June 2019, commence re-negotiation of the Customer Supply Agreement with Wingecarribee Council, with the intent of including water quality reporting that meets the sampling and monitoring capability of the supply system.*
>
> *By 31 December 2019, WaterNSW should undertake a risk-based review of Customer Supply Agreements across all types of customers (including all customers who are supplied drinking water) to ensure that the supply of water meets the terms and conditions of those agreements.*
>
> *By 30 June 2020, WaterNSW should develop and implement processes to address identified gaps based on the outcomes of the review of Customer Supply Agreements."*

In relation to clause 6.3.1, IPART noted at page 35:

> *"WaterNSW prepared a new procedure for determining water take during the audit period, which was finalised after the audit period. Our auditor found the procedure was sufficient for the purpose of measurement and estimation, but lacked consideration of accuracy and therefore the non-compliance is material.*
>
> *WaterNSW outlined various checks and balances to provide assurance over the estimates of water take. However WaterNSW did not make an assessment of accuracy of water take. The licence clearly states that accuracy is an objective in determining take for the purposes of account management, billing, and reporting. The failure to assess accuracy of water take and set objectives could adversely impact the ability to WaterNSW to provide assurance over the account management, billing and reporting and is considered a material non-compliance."*

IPART made the following recommendation in relation to clause 6.3.1 at page 35 of the 2018 Audit Report:

> *"By 30 September 2019, WaterNSW should set objectives for the accuracy of water take determination with respect to billing, account management and reporting.*
>
> *By 31 December 2019, WaterNSW should assess the accuracy of its water take estimates for the purposes of billing, account management and reporting."*

IPART Enforcement Action and rectification plan

In its meeting of 10 April 2019, IPART decided under section 17(1) of the *Water NSW Act 2014 (NSW)* to impose the following monetary penalties on Water NSW:

- $25,000 for contravening clause 2.1.1 of the Licence; and
- $25,000 for contravening clause 5.1.1 of the Licence.

These penalties were paid by WaterNSW on 9 May 2019.

On 31 May 2019, WaterNSW submitted to IPART a comprehensive remediation plan to ensure all audit recommendations and issues are resolved by the timeframes specified.

WaterNSW is committed to ensure that this remediation plan is adhered. WaterNSW is seeking to ensure that its future audit performance returns to the levels seen previously. WaterNSW sees the 17/18 audit result as a transitional year due to a new operating licence and a new auditing framework. The work that WaterNSW will do from its remediation plan should boot-strap its compliance obligations to ensure a more positive audit result going forward.

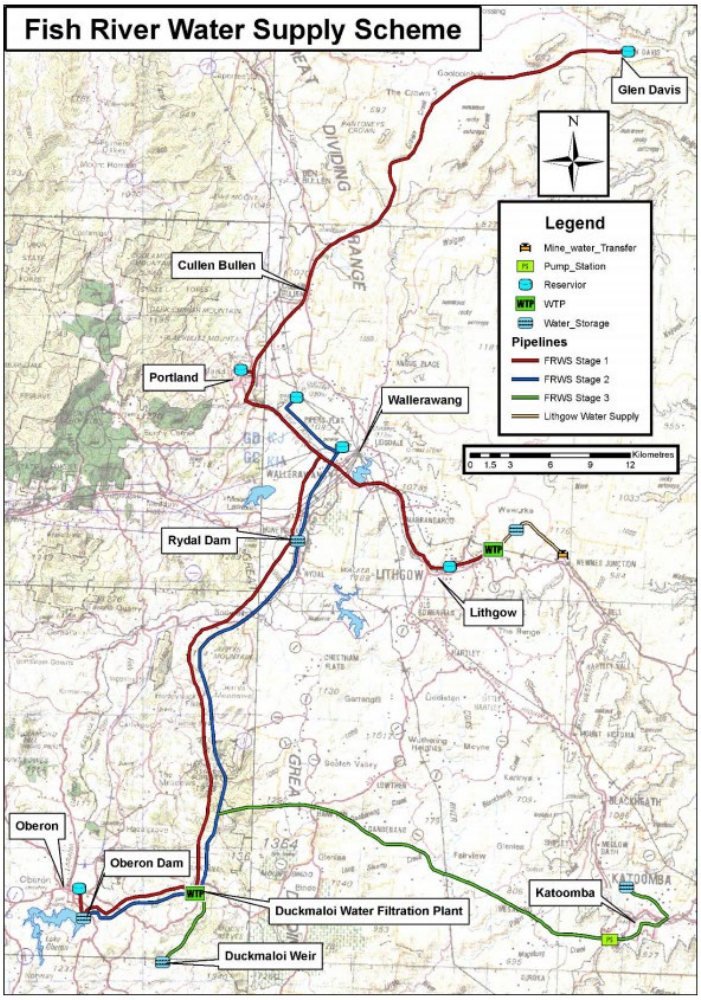
Appendix F – Fish River Bulk Water and WAMC Licensing Costs

Fish River Bulk Water Costs

WaterNSW has included in its expenditure profile the cost of purchasing bulk water transfers of $2.1 million per annum from the Fish River Water Supply Scheme (FRWS) into the Blue Mountains systems[95] as a water balancing measure to provide bulk water to Greater Sydney and Sydney Water.

The purpose of the FRWS is to provide raw and filtered water to Oberon and Lithgow councils, EnergyAustralia, WaterNSW and approximately 311 smaller customers.[96] The FRWS includes water which is supplied from Oberon Dam, Rydal Dam and Duckmaloi Weir. WaterNSW is able to access water from Oberon Dam and Duckmaloi Weir as shown in Figure F.1 below.[97]

Figure F.1 – Fish River Water Supply Scheme



Source: May 2012 State Water Corporation License Fish River Scheme

[95] The Blue Mountains Raw Water Supply consists of 5 small storages located in the Upper Blue Mountains and the Fish River Pipeline to the Fish River Water Supply Scheme (FRWS).

[96] In its application to the IPART Annual review of MDB charges, WaterNSW reported approximately 83 ra water customers and 228 filtered water customers in the Fish River Scheme. https://www.ipart.nsw.gov.au/files/sharedassets/website/shared-files/pricing-reviews-water-services-metro-water-waternsw-annual-review-of-rural-bulk-water-charges-2019-20/legislative-requirements-waternsw-annual-review-of-rural-bulk-water-charges-2019-20/waternsw-pricing-application-waternsw-annual-review-of-rural-bulk-water-charges-2019-20.pdf

[97] http://www.water.nsw.gov.au/__data/assets/pdf_file/0009/549603/local_water_utilities_fish_river_report.pdf

Prior to the merger of SCA and SWC into WaterNSW in 2016, SCA purchased bulk water from SWC who owned and operated the Fish River Water Supply Scheme (FRWS).

Under this arrangement, the water entitlements for the FRWS were held by SWC instead of each customer. The water was on-sold by SWC to customers, including the SCA in accordance with the licence issued by WAMC to SWC under Part 9 of the Water Act 1912[98].

The SCA was entitled to a Minimum Annual Quantity (MAQ) of 3,650MLs per year, for which SCA was charged by SWC both:

- a fixed charge based on the number of MAQs
- a variable charge based on the volumes extracted from the FRWS in accordance with the charges set by IPART under its 2010-2014 IPART Bulk Water Determination for SWC.[99]

In the 2016-20 Determination, IPART approved an allowance of approximately $3.3 million per annum for bulk water purchases from the FRWS into the Blue Mountains System. It is understood that this allowance was generally reflective of the charges set by IPART in its 2010-2014 SWC Bulk Water determination.

Since the merger of SCA and SWC, the FRWS is owned and operated by WaterNSW and holds an MAQ of 3,650MLs per year to supply bulk water into the Blue Mountains system for Greater Sydney and Sydney Water.

WaterNSW levies regulated charges under both:

- the 2016-20 Determination, which includes a cost allowance for Fish River Transfers to be passed onto Greater Sydney bulk water customers
- the Rural Valleys Determination through which the charges for FRWS are set by IPART.

Due to this pricing determination structure, there is a need to include in the 2020-24 expenditure profile the cost of managing bulk water transfers from FRWS into the Blue Mountains System.

In its expenditure profile for the 2020-24 Determination, WaterNSW has included the mandatory cost of Fish River Bulk Water Transfers. The expected costs have been derived using the existing charges for the FRWS under the Rural Valleys Determination. WaterNSW has forecast a reduction in Fish River Bulk Water costs of approximately 35%, as shown in Table F1 below.

[98] http://www.water.nsw.gov.au/__data/assets/pdf_file/0008/547109/utlities_state_fish_river_water_supply_scheme_pt9_licence.pdf

[99] The regulated charges for the FRWS were set under two rural valleys determinations: (1) FRWS charges for raw water supply was determined by the ACCC under the *Water Charge (Infrastructure Rules) 2010 Cth* and the ACCC 2014-17 Murray Darling Basin Bulk Water Determination, while (2) FRWS charges for filtered water supply (which includes water which is supplied to the former SCA) was determined by IPART as part of its 2010-2014 determination for Rural Valley Bulk Water Charges. Due to structural reform issues, IPART extended the application of the 2010-2014 determination prices with respect to filtered water customers to 2017, at which point the charges for both raw and filtered water customers were reviewed as part of the 2017-21 Rural Valleys Determination.

Table F.1 – Fish River Water Transfer costs included in operating expenditure ($2019-20)

Actual / forecast Fish River purchases ($millions, $2019-20)	
FY2017-2020 Average Allowance	3.28
FY2017-2020 Average Cost	2.52
FY2021-24 Average expected expenditure	2.12
% reduction from average allowance	-35.46%

Note * The average expected expenditure is determined by 1) a fixed bill calculated by multiplying the fixed charge set under the 2017-21 IPART Rural Valleys Determination by the number of MAQs held by WaterNSW (3,650MLs) and 2) a variable bill calculated by multiplying the variable charge by the 20-year rolling average of actual usage by SCA/WaterNSW.

Source: WaterNSW analysis

The reduction in expected cost for FRWS bulk water transfers is driven by a lower cost base for the FRWS, reflecting the post-merger efficiencies generated through the merger of SCA and SWC into WaterNSW in 2016.

For instance, the FRWS charges set by IPART under the Rural Valleys Determination, which predate the 2016-20 Determination are significantly lower than FRWS charges in the 2010-14 IPART Bulk Water Determination, which were set using a pre-merger cost base for the FRWS, the cost of which was passed onto Greater Sydney bulk water customers under the 2016-20 Determination.[100]

Furthermore, in its Rural Valleys Determination, IPART changed the proportion of fixed and variable charges for FRWS customers (including the MAQs held by the former SCA). In the determination, IPART decided to increase the proportion of fixed charges to be recovered from FRWS customers to 80%.[101] This change in the proportion of fixed and variable charges is not reflected in the 2016-20 Determination allowances. WaterNSW is incentivised to utilise the FRWS as much as possible due to the current charging arrangements.

The operational requirements with respect to the Fish River Bulk Water purchases can be found in the 2013 *Raw Water Supply Agreement between Sydney Catchment Authority and Sydney Water Corporation*[102]. Under clause 8(5) of the agreement, the parties are required through an agreed set of operating rules to ensure that the water supplied to the Blue Mountains is optimised to deliver water at the least cost to customers, while maintaining water supply security and reliability.

The Raw Water Supply Protocols between WaterNSW and the Sydney Water specify that Sydney Water's Cascade Water Filtration Plant will receive a blend of Upper Cascade and FRWS water with the aim of meeting supply security requirements at the lowest cost for both organisations.

[100] For example, see figure 5.2, page 46 which shows a 45% reduction in expected operating expenditure in the FRWS. https://www.ipart.nsw.gov.au/files/sharedassets/website/shared-files/investigation-legislative-requirements-water-bulk-water-review-of-prices-for-waternsws-rural-bulk-water-services-from-1-july-2017-formerly-state-water-corporation/final-report-waternsw-review-of-prices-for-rural-bulk-water-services-from-1-july-2017-june-2017.pdf

[101] Ibid, page 11

[102] https://www.waternsw.com.au/__data/assets/pdf_file/0004/118687/SCA-and-SWC-Raw-Water-Supply-Agreement-2013.pdf

WAMC Licensing Costs

Using the charges in the WAMC Determination, WaterNSW has included in its proposed expenditure profile approximately $3.5 million per annum ($2019-20) in potential licensing costs over the upcoming 2020-24 Determination period for illustrative purposes only.

As there is uncertainty around the potential cost base for future WAMC charges, WaterNSW submits that it would be prudent for IPART to permit a pass through of actual WAMC licensing costs, instead of a fixed cost allowance, for the upcoming 2020-24 Determination.

Under clause 26 of the *Water Sharing Plan for the Greater Metropolitan Region Unregulated River Water Sources 2011*, WaterNSW holds a major utility access licence with a share component of 987,000ML authorising WaterNSW to extract water from the Shoalhaven River, Upper Nepean and Upstream Warragamba, Hawkesbury and Lower Nepean Rivers and the Southern Sydney Rivers Water Sources,[103] for delivery to its Greater Sydney bulk water customers, such as Sydney Water, councils and minor customers.

As a licence holder, WaterNSW is levied a regulated charge under the WAMC Determination. These costs need to be passed through to WaterNSW Greater Sydney bulk water customers under the upcoming 2020-24 Determination.

In the 2016-20 Determination, IPART accepted WaterNSW's proposal to include a fixed allowance for WAMC licensing costs [104] of approximately $3.5 million p.a. ($2015-16). The allowance was calculated using the WAMC Determination charges levied on WaterNSW's South Coast unregulated river licences, including:

- South Coast (unregulated rivers) fixed entitlement charge of $1.64 per ML of entitlement held by WaterNSW (2015-16$)
- South Coast (unregulated rivers) usage charge of $1.39 per ML of water extracted by WaterNSW ($2015-16)
- South Coast (unregulated rivers) special fixed entitlement charge for WaterNSW of $0.85 per ML of entitlement ($2015-16) held by WaterNSW to ensure WaterNSW contributes to the cost of developing the 2017 Metropolitan Water Plan for the Sydney metropolitan regions.

In the 2016-20 Determination, WaterNSW's actual licensing costs exceeded the allowance by approximately $33,000 per annum (and $83,000 in 2017-18) ($2015-16) due to Sydney Water's actual sales volumes being higher than the forecast anticipated by the WAMC Determination. This is shown in the Table F.2 below.

Table F.2 – Volume Risk in Greater Sydney due to WAMC (megalitres)

	FY17	FY18	FY19	FY20
DOI sales volumes used to set the WAMC usage charge	529,331	534,742	539,222	545,366
Actual/Forecast Sales volumes	549,355	594,285	564,870	570,304
Difference	-20,024	-59,543	-25,648	-24,938

Source: WaterNSW analysis

[103] https://www.legislation.nsw.gov.au/#/view/regulation/2011/112/part5/div3/sec26
[104] IPART incorporated minor amendments to account for actual WAMC charges determined as part of the IPART 2016-2020 WAMC price review. The 2016-2020 WAMC price review ran in parallel to the Greater Sydney 2016-2020 price review

The cost base used to set the charges in the WAMC Determination may not be relevant as a basis for predicting expected future licensing costs for WaterNSW over the upcoming 2020-24 Determination period.

In 2016, a range of functions previously undertaken by DOI were transferred to WaterNSW, such as customer transactions, compliance investigations, licensing administration and billing, water quality monitoring, hydrometric assessment and metering operations.

Subsequent to this transfer, the independent Natural Resources Access Regulator (NRAR) was established by legislation with total responsibility for compliance and enforcement of water laws in NSW formerly carried out by WaterNSW since 2016.

Given that there is uncertainty around the potential cost base for future charges in any forthcoming determination(s) of charges currently in the WAMC Determination, WaterNSW submits that it would be prudent for IPART to permit a pass through of actual WAMC licensing costs for the upcoming 2020-24 Determination.