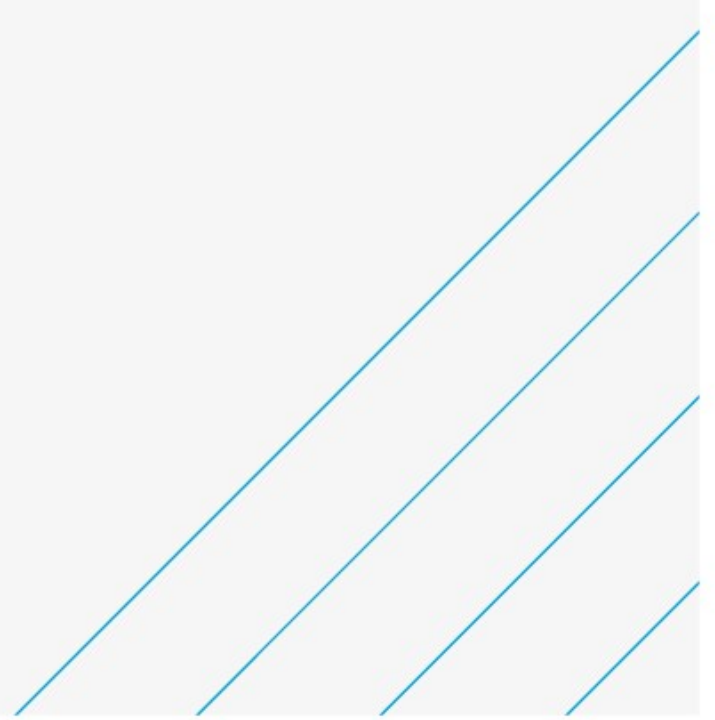


# Sydney Water Corporation Expenditure and Demand Review

Addendum to Final Report

IPART

18 February 2020



# Notice

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# 1. Background

Our Final Report and recommendations were issued to IPART in February 2020 and were based on interviews undertaken in 2019.

At the time of our review, and prior to issuing our Final Report, the Greater Sydney area was experiencing an unprecedented drought with dam levels having depleted to 41.6% by 6 February 2020.

The intensification of the drought was the main driver behind Sydney Water’s “Update to 1 July 2019 proposal” submitted on 12 November 19. This update proposed an additional \$525M of capex for two “water supply system resilience/drought response” schemes which had not been included in the July proposal: the Prospect Macarthur link and Cascade water supply upgrades. It also included \$44M of additional opex associated with these schemes.

We reviewed these proposed schemes in November 2019. Our recommendations are summarised as follows:

**Table 1-1 - Sydney Water proposed drought schemes**

Scheme	Sydney Water proposed expenditure	Our view	Recommended expenditure
Prospect to Macarthur Link	\$560.9M additional capex, of which \$76.9M in 19/20, \$484.2M in the next Determination period. Additional opex of \$10M p.a. increasing to \$15M p.a.	Deferral of the eastern front, reducing capex by \$62.0M  Opex cost impacts had been overestimated	Capex in the next Determination period of \$422.2M (pre-efficiency)  Opex of \$7.4M p.a. maximum, total of \$19.2M in the next Determination period.
Blue Mountains Cascade Supply	\$45.8M additional capex, of which \$4.7M in 19/20, \$41.1M in the next Determination period. Additional opex of \$1M in 22, \$2M in 23 and 24	Recommend the scheme  Adjust opex impact to match Options Appraisal Business Case	\$45.8M additional capex  Opex of \$1.0M p.a.

These schemes had been selected by the drought options study undertaken by Sydney Water and WaterNSW. As we noted in our Final Report:

*The drought options study does not incorporate sophisticated economic optimisation or set out a clear process of options identification and evaluation. However, our view is that the first tranche of interventions is nonetheless reasonably sensible and robust.*

This was in the context that the drought options study projected potential supply shortfalls and therefore the schemes with the shortest lead time were likely to be prudent to avoid major supply issues and defer very significant new investment.

It was also in the context of Bureau of Meteorology climate forecast indicating “no foreseeable signs of reprieve” and dam levels “dropping faster than ever”<sup>1</sup>.

## Prospect to Macarthur Link

This scheme was proposed to allow bi-directional transfer of potable water between the Prospect and Macarthur systems.

<sup>1</sup> Source: Sydney Water presentation “386.2 Session 2a Prospect Macarthur”

Sydney Water justified the scheme on the basis of the intensity of drought, its impact on the Metro dams, specifically Nepean and Avon Dam<sup>2</sup>, and the urgent need to act to reduce the risks of shortfall in Illawarra and Macarthur:

*“Worst drought in recorded history ...the Metro dams are depleting faster than Warragamba ...“There is insufficient time to construct a climate independent source for Illawarra at the current depletion rates”<sup>3</sup>*

We found that the options appraisal process carried out for the project was weak, stating:

*“The Options Appraisal conducted by SWC carried out ‘fatal flaw’ shortlisting but **only for a small number of alternative solutions to address different sections of the link**. The fatal flaw shortlisting resulted in one or two options for all sections of the link. Multicriteria analysis was then used to score these options and select a preferred solution.*

*The options appraisal **did not examine alternative strategic solutions.**”*

Despite this, we concluded that the western front was prudent in the context of the urgency of need stating, *“It helps to address the most **urgent drought shortfall risk** in the southern dams’ system by bringing forward investment which would nearly all be required in order to service growth in the future”.*

We concluded that Sydney Water had not made a strong case that the eastern front was prudent as it was *“primarily driven by future growth expectations”.*

### **Blue Mountains Cascade Supply**

The scheme aims to upgrade the Cascade Water Filtration Plant so that it can treat water from a new raw water source, making an additional water source available for local supply. It also involves upgrading the emergency supply systems from Orchard Hills System.

We found that the Options Appraisal appeared reasonably robust and concluded that the proposed investment was prudent. The only adjustment we proposed was to the proposed additional opex, to match Sydney Water’s own options appraisal business case projections.

### **Rainfall in February 2020**

The recommendations in our Final Report were based on prudent and efficient levels of expenditure in a drought scenario, with reservoir levels well below 50% and continuing to fall.

Following the issuing of our Final Report to IPART, the Greater Sydney area experienced exceptional rainfall, ranging from 240mm in the Warragamba catchment to 520mm in the Blue Mountains catchment in a single week between 6 and 13 February<sup>4</sup>.

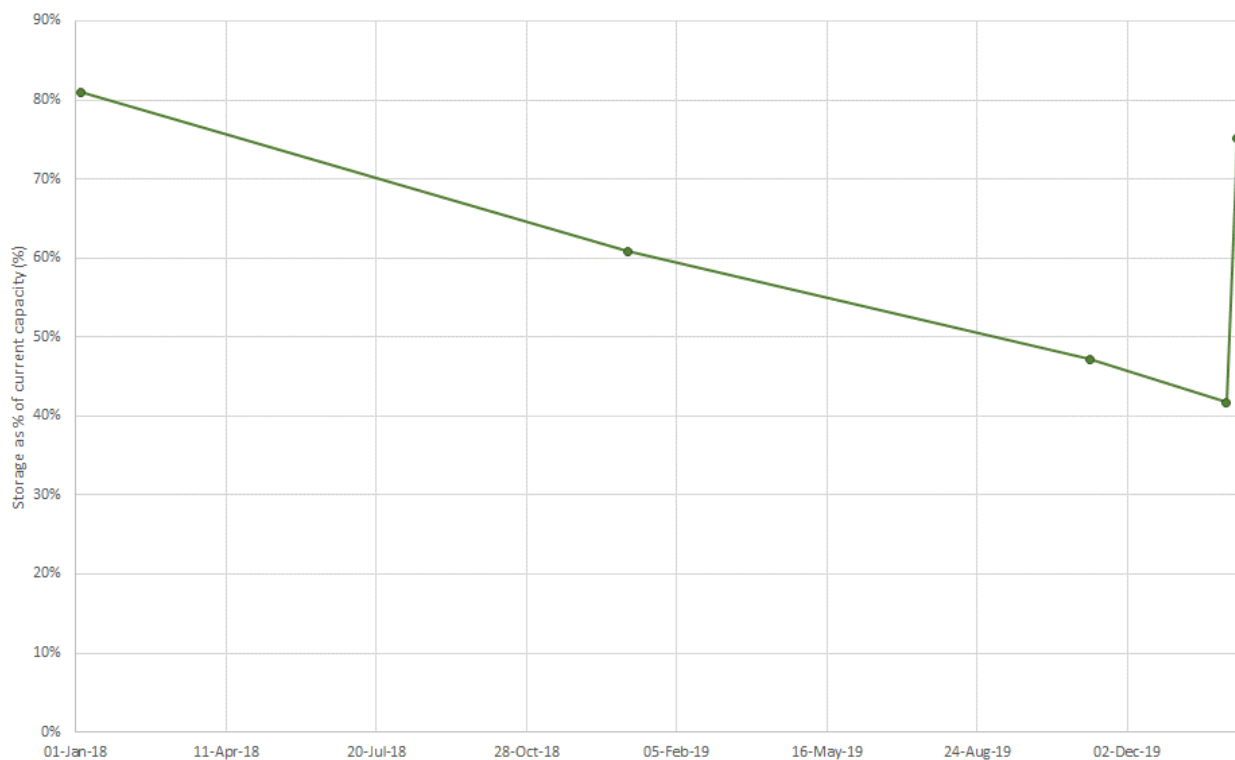
This led to the Greater Sydney dam levels restoring to over 80% of capacity by 17 February 2020.

<sup>2</sup> Source: Sydney Water document “363.2 - ProMac Approved NABC”

<sup>3</sup> Source: Sydney Water presentation “386.2 Session 2a Prospect Macarthur”

<sup>4</sup> Source: Greater Sydney water storage and supply report, weekly edition, WaterNSW, 13 February 2020

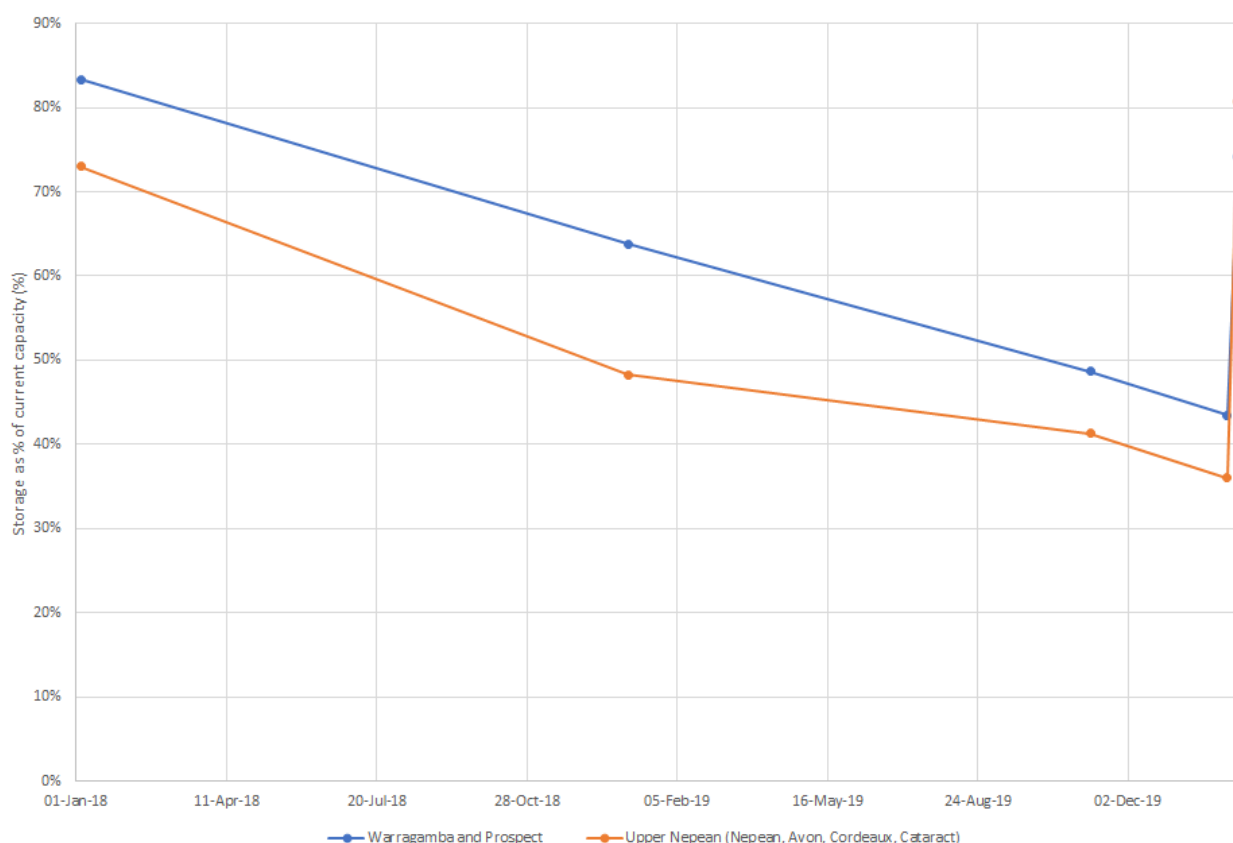
**Figure 1-1 – Greater Sydney reservoir storage levels**



Source: WaterNSW Verified Weekly Storage Reports and Atkins/Cardno analysis

Notably, by 17 February 2020, the Upper Nepean dams had recovered from a level consistently below Warragamba and Prospect to a slightly higher level (82.4% compared to 80.4%).

**Figure 1-2 – Upper Nepean and Warragamba reservoir storage levels**



Source: WaterNSW Verified Weekly Storage Reports and Atkins/Cardno analysis

Following this dramatic increase in storage volumes and subsequent discussions with IPART we consider it timely to adjust our recommended expenditure levels for the 2020 determination period. This addendum considers adjustments to our recommended capital and operating expenditure levels which we discuss in turn below.

## 2. Impacts on our recommendations

### Prospect to Macarthur Link

The drought options study defined triggers for detailed planning [REDACTED] and construction [REDACTED]. When total storage was close to this level and was declining at a rate of approximately 1.5% per month, it was prudent to assume that the scheme would be required in the future Determination period.

With storage on 17 February 2020 in excess of 80%, we no longer consider it prudent to assume that this investment should proceed in the next Determination period. This is because:

1. Total reservoir storage is significantly in excess of (more than double) the construction trigger set out in the drought options study. Storage in the Upper Nepean dams, the main urgent driver for constructing the link, is now at high levels (82.4% on 17 February 2020), higher than in Warragamba.
2. As we noted in our Final Report, the drought options study does not incorporate sophisticated economic optimisation or set out a clear process of options identification and evaluation. Deferring this scheme allows time for a more sophisticated drought response and long term supply-demand plan to be developed, which may identify more cost effective or robust solutions.
3. There are benefits to customer bills of deferring construction closer to the time the scheme is likely to be required.

We therefore consider that it is now prudent to stop significant expenditure on the scheme. We have assumed no further expenditure after June 2020. This is reflected in the revised capex and opex schemes below.

### Blue Mountains Cascade Supply

We consider that this scheme should continue as it helps to address a resilience issue in a discrete part of the supply system and the options appraisal undertaken was robust. We have therefore not recommended a further adjustment related to this scheme.

### Outputs

We recommend amending the outputs for the Future Determination period as follows

- Remove the drought output “*Significantly enhance the ability to transfer water between the metro dams and southern dams areas*”; and

We consider that it would be useful for a robust Long Term Integrated Drought Management Plan to be developed so that future decisions before and during droughts are soundly based. The plan would need to incorporate a clear process of options identification and evaluation, a clear rationale for any constraints applied, and apply stochastic techniques and real options analysis, or similar. We have not recommended an output related to this as the development of strategic water planning for Greater Sydney is led by the Water and Utilities Branch on behalf of the NSW Government, and support to planning of this sort should be a business-as-usual activity for Sydney Water. Because it is a business-as-usual activity, we have also not recommended any additional expenditure related to it.

## 3. Revised capital expenditure recommendations

We summarise below our amended capex recommendations for the future Determination period. The corporate, sewerage and stormwater services and current Determination capex recommendations are unaffected by these changes.



**Table 3-1 Water Service: Summary of Efficient Capital Expenditure**

<b>SYDNEY WATER CORPORATION PROPOSAL - CAPEX - WATER SERVICE</b>							
(\$M 2019/20) year ending June	2021	2022	2023	2024	2025	2021-24 Total	2021-25 Total
Existing mandatory standards	287.4	158.7	163.9	146.6	124.6	756.6	881.2
New mandatory standards	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Discretionary standards	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Growth - funded by other	344.8	102.5	129.4	66.0	51.9	642.7	694.6
Government programs	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Business efficiency	0.0	0.0	0.0	0.0	0.0	0.0	0.0
<b>Total</b>	<b>632.1</b>	<b>261.3</b>	<b>293.3</b>	<b>212.6</b>	<b>176.5</b>	<b>1399.3</b>	<b>1575.8</b>
<b>Atkins/Cardno recommended adjustments for specific programs or projects</b>							
Reservoir Renewals and Reliability	0.0	-7.6	-3.4	-6.0	1.3	-16.9	-15.6
Water PS renewals scope	-4.1	-4.2	-3.0	-2.8	-14.1	-14.1	-28.2
Critical water mains renewal	0.0	0.0	0.0	0.0	-8.5	0.0	-8.5
General growth adjustment	-12.0	-15.9	-15.8	-12.1	10.0	-55.9	-45.8
Metering adjustment	-1.5	-1.5	-1.5	-1.5	-1.5	-6.0	-7.5
Prospect to Macarthur adjustment	-399.5	-22.8	-62.0			-484.2	-484.2
<b>ADJUSTED EXPENDITURE BEFORE APPLICATION OF EFFICIENCY TARGETS</b>							
Existing mandatory standards	161.9	138.6	137.4	136.4	101.7	574.3	676.0
New mandatory standards	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Discretionary standards	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Growth - funded by other	53.2	70.7	70.2	53.9	62.0	247.9	309.9
Government programs	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Business efficiency	0.0	0.0	0.0	0.0	0.0	0.0	0.0
<b>Total</b>	<b>215.1</b>	<b>209.3</b>	<b>207.6</b>	<b>190.2</b>	<b>163.7</b>	<b>822.2</b>	<b>985.9</b>
<b>Atkins/Cardno recommended additional capital efficiency targets (beyond those applied by the company)</b>							
Continuing efficiency (%)	0.80%	1.60%	2.40%	3.20%	4.00%		
Continuing efficiency (\$M)	-1.7	-3.3	-5.0	-6.1	-6.5	-16.1	-22.7
Catch-up efficiency (%)	0.00%	0.00%	0.00%	0.00%	0.00%		
Catch-up efficiency (\$M)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
<b>ATKINS/CARDNO ASSESSMENT OF EFFICIENT EXPENDITURE</b>							
(\$M 2019/20) year ending June	2021	2022	2023	2024	2025	2021-24 Total	2021-25 Total
Existing mandatory standards	160.6	136.4	134.1	132.0	97.6	563.1	660.8
New mandatory standards	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Discretionary standards	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Growth - funded by other	52.7	69.6	68.5	52.1	59.5	242.9	302.4
Government programs	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Business efficiency	0.0	0.0	0.0	0.0	0.0	0.0	0.0
<b>Total Efficient Expenditure</b>	<b>213.3</b>	<b>206.0</b>	<b>202.6</b>	<b>184.1</b>	<b>157.1</b>	<b>806.1</b>	<b>963.2</b>

**Table 3-2 Efficient Level of Capital Expenditure**

<b>SYDNEY WATER CORPORATION PROPOSAL - CAPEX - TOTAL PROGRAM</b>							
(\$M 2019/20) year ending June	2021	2022	2023	2024	2025	2021-24 Total	2021-25 Total
Water	632.1	261.3	293.3	212.6	176.5	1399.3	1575.8
Wastewater	721.5	766.2	791.2	824.3	698.8	3103.1	3801.9
Stormwater	40.1	53.7	43.3	48.0	29.0	185.2	214.2
Corporate	139.0	119.8	76.9	64.0	55.2	399.6	454.8
<b>Total</b>	<b>1532.7</b>	<b>1200.9</b>	<b>1204.7</b>	<b>1148.9</b>	<b>959.5</b>	<b>5087.2</b>	<b>6046.7</b>
<b>Atkins/Cardno recommended adjustments for specific programs or projects</b>							
Reservoir Renewals and Reliability	0.0	-7.6	-3.4	-6.0	1.3	-16.9	-15.6
SGO107 SWPGA	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Water PS renewals scope	-4.1	-4.2	-3.0	-2.8	-14.1	-14.1	-28.2
Critical water mains renewal	0.0	0.0	0.0	0.0	-8.5	0.0	-8.5
General growth adjustment	-12.0	-15.9	-15.8	-12.1	10.0	-55.9	-45.8
Metering adjustment	-1.5	-1.5	-1.5	-1.5	-1.5	-6.0	-7.5
Prospect to Macarthur adjustment	-399.5	-22.8	-62.0	0.0	0.0	-484.2	-484.2
"Wet Weather Overflow Abatement" program efficiency	-9.2	-10.7	-10.9	-9.5	0.0	-40.3	-40.3
Critical and Non-Critical Mains Renewals scope and efficiency	-33.4	-34.9	-32.5	-31.9	-6.7	-132.7	-139.4
Quakers Hill and St Marys WWTP variation	14.1	0.0	0.0	0.0	0.0	14.1	14.1
WWTP renewals prudence	-18.0	11.1	7.3	-19.2	38.0	-18.8	19.2
Richmond/North Richmond Amplification	0.0	-4.1	0.0	0.0	0.0	-4.1	-4.1
Upper South Creek Expenditure	93.2	19.4	12.1	-48.9	114.2	75.9	190.0
General growth adjustment	-46.0	-42.4	-56.1	-35.7	-44.0	-180.2	-224.2
Wastewater PS civil works	5.0	5.0	5.0	5.0	5.0	20.0	25.0
Stormwater Renewals	0.0	-5.8	-4.6	-5.4	18.3	-15.8	2.5
Waterway health	1.6	1.6	1.6	1.6	-6.5	6.5	0.0
BxP Imprudence Adjustment	0.0	0.0	0.0	0.0	0.0	0.0	0.0
<b>ADJUSTED EXPENDITURE BEFORE APPLICATION OF EFFICIENCY TARGETS</b>							
Water	215.1	209.3	207.6	190.2	163.7	822.2	985.9
Wastewater	727.3	709.5	716.1	684.1	805.2	2837.0	3642.2
Stormwater	41.7	49.6	40.3	44.2	40.8	175.9	216.6
Corporate	139.0	119.8	76.9	64.0	55.2	399.6	454.8
<b>Total</b>	<b>1123.0</b>	<b>1088.2</b>	<b>1040.9</b>	<b>982.6</b>	<b>1064.9</b>	<b>4234.7</b>	<b>5299.5</b>
<b>Atkins/Cardno recommended additional capital efficiency targets (beyond those applied by the company)</b>							
Continuing efficiency (%)	0.80%	1.60%	2.40%	3.20%	4.00%		
Continuing efficiency (\$M)	-9.0	-17.4	-25.0	-31.4	-42.6	-82.8	-125.4
Catch-up efficiency (%)	0.00%	0.00%	0.00%	0.00%	0.00%		
Catch-up efficiency (\$M)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
<b>ATKINS/CARDNO ASSESSMENT OF EFFICIENT EXPENDITURE</b>							
(\$M 2019/20) year ending June	2021	2022	2023	2024	2025	2021-24 Total	2021-25 Total
Water	213.3	206.0	202.6	184.1	157.1	806.1	963.2
Wastewater	721.4	698.2	698.9	662.2	773.0	2780.7	3553.8
Stormwater	41.4	48.8	39.4	42.8	39.1	172.4	211.5
Corporate	137.8	117.9	75.0	62.0	53.0	392.7	445.7
<b>Total Efficient Expenditure</b>	<b>1114.0</b>	<b>1070.8</b>	<b>1015.9</b>	<b>951.1</b>	<b>1022.3</b>	<b>4151.8</b>	<b>5174.1</b>

### 3.1. Efficient capital expenditure by asset type

Based on the revised expenditure above we report in Table 3-3 below our amended findings on efficient capital expenditure by service and asset category for water services. The corporate, sewerage and stormwater services and current Determination capex recommendations are unaffected by these changes.

**Table 3-3 Recommended water capital expenditure by asset category**

	2020	2021	2022	2023	2024	2025	Total 2020-24
Civil	186.1	176.7	170.6	155.6	145.9	133.6	648.9
Electrical	10.1	7.3	7.4	11.2	8.4	3.6	34.3
Mechanical	35.4	25.4	23.6	29.1	25.0	18.2	103.1
Electronic	4.7	4.0	4.3	6.6	4.8	1.8	19.7
Non-Depreciable Asset	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Efficient expenditure	236.4	213.3	206.0	202.6	184.1	157.1	806.1

## 4. Revised operating expenditure recommendations

As set out in Section 2, we now consider that it is prudent to stop significant expenditure on the Prospect to Macarthur link. We have therefore assumed that no operating expenditure is required in the 2020 determination period. This is reflected in the revised operating expenditure table below.

The impact of these changes to total operating expenditure is shown in Table 4.1 below.

**Table 4-1 Efficient Level of Operating Expenditure**

<b>SYDNEY WATER TOTAL OPERATING EXPENDITURE</b>					
(\$m 2019/20) year ending June	<b>2021</b>	<b>2022</b>	<b>2023</b>	<b>2024</b>	<b>Total 2021 to 2024</b>
Water	393.2	409.4	410.5	410.1	1623.2
Water BOO	101.0	101.7	101.8	102.4	407.0
Wastewater	482.1	483.2	476.4	474.1	1915.7
Stormwater	14.5	14.8	15.0	15.2	59.5
Recycled Water	33.0	32.9	32.1	32.3	130.2
<b>TOTAL CORE OPERATING EXPENDITURE (including base efficiencies)</b>					
Total including base efficiencies	1023.8	1042.0	1035.8	1034.1	4135.6
Base efficiencies by Sydney Water	20.0	18.2	31.5	34.8	104.5
Total excluding SWC efficiencies	1043.8	1060.2	1067.3	1068.9	4240.1
<b>SCOPE ADJUSTMENTS</b>					
Prospect Macarthur pipeline	0.00	-10.00	-14.00	-15.00	-39.00
Cascade	0.00	0.00	0.00	0.00	0.00
Water reactive - inefficient leakage expenditure	-10.00	-10.00	-10.00	-10.00	-40.00
Wastewater reactive/ environmental program	-7.50	-7.50	-7.50	-7.50	-30.00
BOO water treatment - volume	-0.24	-0.27	-0.29	-0.31	-1.11
BOO water treatment - treatment	-3.30	-3.30	0.00	0.00	-6.60
Electricity	0.00	-0.52	-1.86	-1.86	-4.24
City Planning	0.00	0.00	-8.00	-8.00	-16.00
Water conservation (to cost pass through)	-5.00	-5.00	-5.00	-5.00	-20.00
Infrastructure resilience (to bau)	-2.00	-2.00	-2.00	-2.00	-8.00
Total change in scope	-28.04	-38.59	-48.65	-49.67	-164.95
<b>EFFICIENCY ADJUSTMENTS</b>					
Catchup efficiency	0.00	0.00	0.00	0.00	0.00
Continuing efficiency - Frontier Shift	-8.13	-16.35	-24.45	-32.62	-81.53
Total efficiency adjustments	-8.13	-16.35	-24.45	-32.62	-81.53
<b>TOTAL ADJUSTMENTS</b>					
Total adjustments	-36.17	-54.94	-73.09	-82.28	-246.48
<b>SYDNEY WATER PROPOSED EFFICIENCY CHALLENGE</b>					
Business-wide efficiency gain	-5.08	-15.32	-25.47	-40.77	-86.64
<b>EFFICIENT BASE OPERATING EXPENDITURE</b>					
Water	373.08	375.69	368.91	364.26	1481.94
Water BOO	96.70	96.58	99.10	98.87	391.25
Wastewater	470.76	467.85	448.70	442.69	1830.00
Stormwater	14.35	14.59	14.65	14.77	58.36
Recycled Water	32.70	32.34	31.33	31.24	127.62
Total base opex	987.60	987.04	962.69	951.83	3889.16
<b>BULK WATER</b>					
WNSW Bulk supply	189.18	193.73	199.58	202.78	785.27
SDP	180.62	178.81	178.81	178.81	717.05
<b>TOTAL EFFICIENT EXPENDITURE</b>					
<b>Total</b>	<b>1357.40</b>	<b>1359.58</b>	<b>1341.08</b>	<b>1333.43</b>	<b>5391.49</b>

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