

IPART

Sydney Water Corporation - Expenditure Review

Supplementary Report

06 June 2016



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Glossary

Term	Definition
AIR	Annual Information Return
CMA	Competition and Markets Authority, UK
CRC	Current Replacement Cost
CRM	Customer Relationship Management System
CWM	Critical Water Main
DD	Draft Determination
DSP	Developer Service Plans
ECM	Efficiency Carryover Mechanism
EPPM	Enterprise Program and Project Management
ERP	Enterprise Resource Planning
E&W	England and Wales (water companies of)
IPART	Independent Pricing and Regulatory Tribunal
MEERA	Modern Engineering Equivalent Replacement Asset
MLD	Mega litres per Day
MOU	Memorandum of Understanding
NPV	Net present value
NSOOS	Northern Suburbs Ocean Outfall Sewer
NWGC	North West Growth Centre
PBC	Program Business Case
PCA	Process Capability Assessment
PCG	Project Control Group
RAB	Regulated Asset Base
RBCE	Risk Based Cost Estimate
RCM	Regulatory Cost Model

Term	Definition
SAP	It is a trademark name for a leading Enterprise Resource Planning system (Systeme, Anwendungen, Produkte in der Datenverarbeitung which translates from German into Systems, Applications & Products in Data Processing).
SCADA	System Control and Data Acquisition
SWC	Sydney Water Corporation
SWIMS	Sydney Water Information Management System
T2020	Billing system replacement for Access
TSS	Total Suspended Solids
WFP	Water Filtration Plant
WWTP	Wastewater Treatment Plant

Executive summary

This report presents the findings of our review of Sydney Water's representations on the capital and operating expenditure elements of IPART's Draft Report. IPART issued its Draft Determination and Report in March 2016. Sydney Water submitted a document in response to the Draft Report in April 2016. We were subsequently asked by IPART to review this submission and report our findings to the Tribunal. This report has been prepared in accordance with the Terms of Reference set out in the contract between Atkins/Cardno and IPART dated 6th April 2016.

The scope of our review focused on those areas of expenditure challenged by Sydney Water. This comprised operating expenditure, prudent expenditure and elements of capital expenditure related to metering, North West Growth Centre, wastewater treatment works renewals, North Head biosolids, avoid fail sewers, reticulation water mains and capital procurement efficiency.

We held a series of meetings with Sydney Water on 27 and 28 April to discuss specific areas of challenge. We set out our approach to the review of efficiency and prudence and discussed Sydney Water's representations. Further information was provided by Sydney Water at and following these meetings. We discussed our findings with the IPART Secretariat and presented our findings to the Tribunal on 4 May 2016. This Supplementary Report sets out our findings of this review. This report should be read in parallel with our Final Report on the Efficiency Review¹.

Operating Expenditure

Sydney Water has responded positively to the efficiency challenge made by the Draft Report and has carried out further analysis to identify more efficiencies from core operating expenditure. While we still consider there are further efficiencies to be made, which may be incentivised through the opex ECM, they are difficult to quantify and validate with sufficient certainty. Sydney Water identified cost risks although these have a small impact on the total future price path expenditure which we believe can be managed by a highly experienced and professional team. We therefore accept the Sydney Water revised proposals.

IPART has advised us that its view on efficient electricity costs has resulted in a change to the efficient expenditure adjustment from -\$19.4M to -\$9.3M.

Table 1-1 Efficient Expenditure after May 2016 review

SYDNEY WATER EFFICIENT EXPENDITURE - REVISED AFTER MAY 2016 REVIEW					
(\$k 2015/16) year ending June	2017	2018	2019	2020	Total 2017 to 2020
Sydney Water 2015 proposal	772.5	774.1	769.1	764.0	3079.6
IPART Draft Decision	764.2	757.9	742	734.8	2998.9
Atkins Cardno revised expenditure	771.4	766.1	751.1	744.0	3032.7

Prudent Expenditure

We found that there is no further evidence to change our original view that early write-off of the CMS system was not prudent. The regulatory asset lives are based on Sydney Water's current assumptions for specific assets. Given the size of the original expenditure we consider it appropriate to apply a specific asset life rather than the average. The impact of this early write-off is a \$24.8m adjustment in 2018.

Capital Expenditure

We have reviewed our original findings taking into account our discussions with Sydney Water and the further information it has provided. We have accepted expenditure related to metering and the North West Growth

¹ Sydney Water Corporation Expenditure Review, Atkins Cardno December 2015

Centre. We have accepted in part the representations on reticulation mains renewals, avoid-fail sewers and some double counting on procurement efficiency. We have accepted some elements of the wastewater treatment plant renewals but there is still a material difference between Sydney Water and our view on efficient expenditure. We found that there was insufficient evidence to change our view on the North Head biosolids project although we revised the expenditure adjustment.

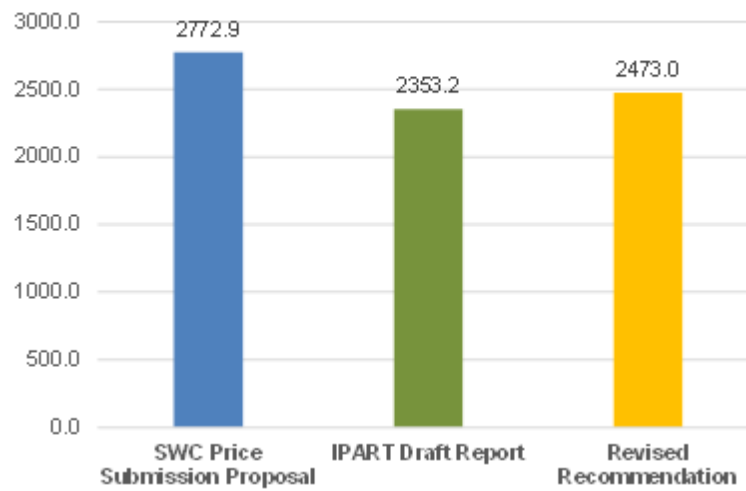
The impact on expenditure of our review is shown in Table 1-2. Our original efficiency proposal was for \$419.7M of scope adjustments and efficiencies. Sydney Water accepted \$185.3M but challenged \$234.5M. As a result of our review, we accepted \$119.8M as supported expenditure. The final capex adjustment applied to the Sydney Water 2015 submission was \$299.9M.

Table 1-2 Efficient Expenditure after May 2016 review

CAPITAL EXPENDITURE ADJUSTMENTS (\$15-16M)					
Area	IPART Draft Report	SWC Accept	SWC Challenge	Change resulting from this Review	Final Capex adjustment
1. Catch-up & continuing efficiency:	-155.0	-116.1	-38.9	26.6	-128.4
2. Pre-Efficiency Adjustments:					
2a SWC Accept / Accept With Concern	-69.1	-69.1	0.0	0.0	-69.1
2b SWC Dispute...					
Wastewater Treatment renewals	-101.5	0.0	-101.5	39.5	-62.0
Avoid Fail Sewers	-34.3	0.0	-34.3	8.8	-25.5
Reticulation Water Mains	-26.1	0.0	-26.1	21.2	-4.9
North Head Biosolids	-13.3	0.0	-13.3	4.1	-9.2
North West Growth Centre	-13.4	0.0	-13.4	13.4	0.0
Metering	-7.1	0.0	-7.1	6.4	-0.7
Total Adjustments	-419.7	-185.3	-234.5	119.8	-299.9

The results of this review are to propose an overall capital program in the future price path of \$2473.0M which is 11% lower than SWC's original price submission proposal. This compares with the \$2353.2M in the IPART Draft Report. This is shown in Figure 1-1 below.

Figure 1-1 Summary of revised capital expenditure program recommendation for 2017-20 (\$15-16M)



The level of efficient expenditure by year and service area is shown in Table 1-3. The adjustments following this review are highlighted.

Table 1-3 Efficient level of Capital Expenditure at company level

SYDNEY WATER CORPORATION PROPOSAL - CAPEX - COMPANY LEVEL					
(\$M 2015/16) year ending June	2017	2018	2019	2020	2017-20 Total
Water	194.8	189.4	185.4	161.2	730.8
Wastewater	371.9	404.5	386.7	337.0	1500.2
Stormwater	49.3	42.4	42.3	25.4	159.4
Corporate	99.3	96.2	93.6	93.5	382.6
Total	715.3	732.5	708.0	617.1	2772.9
Atkins/Cardno recommended adjustments for specific programs or projects					
"Critical Watermain Renewals"	-2.0	-2.0	-2.0	-2.0	-8.0
" Reticulation Watermain Renewals"	-1.2	-1.2	-1.2	-1.2	-4.9
" Reservoir Renewal and Reliability"	-5.8	-5.0	-4.9	-4.9	-20.5
" WPS Renewals"	-4.0	-5.7	-2.0	-1.4	-13.1
Reprofiled NWGC spend	0.0	0.0	0.0	0.0	0.0
Adjusted Meter Investment Program	-0.3	-0.3	-0.1	0.0	-0.7
Water-Efficiencies already applied to growth program	3.5	3.6	3.4	2.0	12.4
"Avoid Fail Sewer Renewals"	-16.7	-8.8	0.0	0.0	-25.5
"WWTP Renewals"	-12.8	-12.8	-16.2	-20.2	-62.0
Reprofiled NWGC spend	0.0	0.0	0.0	0.0	0.0
Energy management	-1.2	-3.8	1.4	1.4	-2.2
North Head Biosolids	-3.3	-5.9	0.0	0.0	-9.2
Wastewater-Efficiencies already applied to growth program	6.9	8.5	5.0	2.1	22.5
Minor Stormwater Renewals	0.0	-3.5	-1.2	-0.6	-5.3
Adjustment for updated Rouse Hill projections	-1.6	0.0	0.0	0.0	-1.6
Elizabeth Macarthur reprofiling	-1.2	-5.6	-2.9	2.2	-7.5
Field Management	0.0	0.0	-1.5	-1.5	-3.0
Specific adjustment for ERP Stage 2	0.0	0.0	-4.0	-4.0	-8.0
Total	-39.7	-42.5	-26.2	-28.2	-136.6
ADJUSTED EXPENDITURE BEFORE APPLICATION OF EFFICIENCY TARGETS					
Water	185.0	178.7	178.5	153.7	696.0
Wastewater	344.8	381.7	376.9	320.2	1423.7
Stormwater	46.5	33.3	38.3	27.0	145.1
Corporate	99.3	96.2	88.1	88.0	371.6
Total	675.6	690.0	681.8	588.9	2636.3
Atkins/Cardno recommended additional capital efficiency targets (beyond those applied by the company)					
Continuing Efficiency (%)	0.25%	0.50%	0.75%	1.00%	
Catch-up efficiency (%)	2.90%	5.80%	7.20%	8.60%	
ATKINS/CARDNO ASSESSMENT OF EFFICIENT EXPENDITURE					
(\$M 2015/16) year ending June	2017	2018	2019	2020	2017-20 Total
Water	179.3	168.1	165.4	140.3	653.1
Wastewater	334.3	359.1	349.1	292.2	1334.7
Stormwater	45.1	31.4	35.4	24.6	136.6
Corporate	96.2	90.5	81.6	80.3	348.6
Total Efficient Expenditure	655.0	649.1	631.5	537.4	2473.0

Atkins Cardno would like to take this opportunity to thank Sydney Water Corporation for the professional manner in which it presented information at interviews and responded to our questions and requests for further information.

We include in Appendix B our response to other representations on the IPART Draft Report related to Sydney Water's IT proposals.

1. Introduction

1.1 Terms of Reference

In August 2015 the Independent Pricing Tribunal of New South Wales (IPART) appointed the Atkins/Cardno consortium to carry out a detailed review of the Sydney Water Corporation's operating expenditure and capital expenditure. The purpose of this review is to inform the Tribunal's Determination on prices for the upcoming price control period which applies from 1st July 2016 to 30th June 2020.

IPART issued its Draft Determination and Report in March 2016. Sydney Water submitted a document in response to the Draft Report in April 2016. We were subsequently asked by IPART to review this submission and report our findings to the Tribunal. This report has been prepared in accordance with the Terms of Reference set out in the contract between Atkins/Cardno and IPART dated 6 April 2016. These are reproduced in Appendix A.

1.2 Sydney Water Corporation submission to IPART

Sydney Water submitted a report to IPART dated 18 April making representations on a range of issues in the IPART Draft Report. Our Terms of Reference asked us to review those areas of operating and capital expenditure which were challenged by Sydney Water. These related to

- Operating expenditure adjustments
- Prudent expenditure in relation to the CRM system
- Capital expenditure procurement efficiency
- Metering
- North West Growth Centre
- Wastewater treatment works renewals
- North Head Biosolids
- Avoid fail sewers
- Reticulation water mains

Whilst we have endeavoured to satisfy ourselves as to the provenance and robustness of the data provided, a detailed audit of the completeness and accuracy of the information lies outside the scope of this project.

1.3 Review Process

We, the Atkins/Cardno team, commenced our review on 20 April 2016. Following a review of the Sydney Water submission, we held a series of meetings with Sydney Water on 27 and 28 April to discuss specific areas of challenge. We set out our approach to the efficiency and discussed Sydney Water's representations. Further information was provided by Sydney Water at and following these meetings. We discussed our findings with the IPART Secretariat and presented our findings to the Tribunal on 4 May 2016. We submitted this Supplementary Report on 11 May 2016 setting out our findings on the Sydney Water submission. This report should be read in parallel with our Final Report on the Efficiency Review².

Atkins/Cardno would like to take the opportunity to thank Sydney Water Corporation for making its staff available for the interview days and for the professional manner in which the organisation responded to our challenges and requests for further detail.

² Sydney Water Corporation Expenditure Review, Atkins Cardno December 2015

2. Operating Expenditure

2.1. Efficient Expenditure in IPART Draft Report

Our approach to efficient expenditure in the future price path followed the concept of catch-up efficiency to achieve the performance of a frontier agency and the continuing efficiency it will make over time through innovation, systems and improved management processes.

We found that a low risk approach is taken across both operating and capital expenditure and there is little appetite to increase this. At the same time, there was no regulatory incentives for Sydney Water to take greater risks on service provision to drive greater efficiencies. While this will be debated through the next price path period, we have identified some areas where risks are not shared equitably with customers. In these areas, both operating and capital expenditure, we made adjustments as a surrogate for the impact of incentives. We subsequently noted that an opex ECM has been included in IPART's Draft Report.

We noted the significant efficiencies were achieved through the current price path, greater than those set in the Determination. These initiatives will continue to drive efficiencies through the current price path.

We made adjustments to two specific areas: energy costs to reflect balancing cost risks with customers and Service Delivery expenditure where we would expect further optimisation and risk based approach will lead to an even trend in expenditure. We considered applying a reduction in this trend but concluded that effective planned maintenance is essential to be able to defer some capital expenditure presented in the submission. We amended the operating expenditure forecast following Sydney Water's representations.

Our benchmarking comparisons of totex showed that Sydney Water has further efficiencies to make to approach a frontier company or the average of the UK companies using the CMA analysis. We applied catch-up efficiency increasing from 0.5% in 2017 to 2% in 2020. We adjusted the level of catch-up following representations from Sydney Water in November 2015. This reflects the full impact of the initiatives implemented in the current price path and the impact of the procurement strategy currently being phased in. In addition, we noted the Business Improvement initiatives being promoted and the forecast benefits from the ERP information technology system being implemented. We also took account of the current transformation project and the likely changes this will bring towards the latter half of the future price path. This adjusted level of catch-up efficiency does not assume that Sydney Water should be at the frontier by 2020 but reflects the achievability of delivering further cost reductions over the future price path.

We assumed a continuing efficiency of 0.25% per annum to reflect overall technological improvements and innovation that a frontier company competing in an open market with strong commercial pressures, would be implementing. This is consistent with the 2012 Determination. We excluded bulk water, recycled water and energy costs from the adjustments we have made. These efficiencies are challenging but the Corporation has experienced professionals who are motivated to deliver.

The impact of our combined continuing and catch-up efficiency was to set a level of efficient expenditure of an average 0.75% per annum cumulative although weighted to the second part of the future price path. We have compared this with a recent efficiency analysis supporting the UK Competition and Markets Authority (CMA) determination on Bristol Water. Our proposal is below the CMA analysis in Section 6.6 and recognises that Sydney Water may need more time to achieve improved level of efficiency compared with others.

2.2. Sydney Water Submission

Sydney Water accepted our efficiency findings related to energy costs (-\$19.4M) and re-profiling of Service Delivery costs (-\$8.5M). It had carried out a detailed review of its core operating expenditure forecast using a bottom-up approach from Divisional budgets. This led to a net efficiency reduction of \$28.1M. It disputed \$24.7M of operating efficiencies. It also highlighted some risks of higher costs through greater water demand through water filtration works, electricity costs, and the impact of capital expenditure reductions planned for Reticulation Water mains, Avoid Fail sewers and wastewater treatment plants.

Sydney Water explained why it did not accept our continuing and catch-up efficiency as applied to operating expenditure, although this was accepted when applied to capital expenditure. One main reason was that the methodology and data was not sufficiently validated.

2.3. Review

We note that while Sydney Water accepted the energy efficiency review challenge of \$19.4M, it has identified up to nearly half this amount as a risk, dependent on the outcome of the Electricity Price Review. We note that IPART is responding to this adjustment to ensure a consistent approach is taken with all water utilities.

Sydney Water has also accepted the re-profiling of Service Delivery expenditure (-\$8.5M). While it has challenged the basis of the catch-up and continuing efficiency adjustments, Sydney Water has accepted \$28.1M of efficiencies. The outstanding challenge related to \$24.7M of efficiencies which is 0.8% of total expenditure.

Sydney Water has derived the further efficiencies from a review of its core operating expenditure using the methodology it applied to the 2015 submission. This included a detailed review and update of its divisional budgets and internal challenge through its 'heat map' and other adjustments. These are offset by the cost of some new initiatives. Savings from the heat map process include SPS optimisation, analytical services and reductions in IT staff and backfilling. Reductions from other initiatives include postage costs, training and removal of capitalised labour uplift. Additional costs from new initiatives include 'safe and well together', growth servicing and customer communications. We formed the view that Sydney Water has responded positively to the efficiency challenge.

Sydney Water commented that further efficiencies are expected although the timing is uncertain and are more likely to be reflected in subsequent price paths beyond the future price path under review. Our view is that further efficiencies are likely through the Transformation Project and related restructuring although the extent and timing are not defined.

We also took into account the impact of the opex ECM and the incentive to drive further efficiencies for sharing with customers.

Sydney Water identifies some additional risks related to the efficiency adjustments.

- Electricity costs: \$5M to \$10M (up to 0.33% of operating costs) of the \$19.4M adjustment due to network price increases following the successful appeal of the Australian Regulator's decision, with the timing and extent of risk yet to be determined. We were advised that IPART will review this aspect to ensure consistency with other utilities;
- Higher water filtration costs: \$1M (0.03%) is as a result of higher demand forecasts assumed by IPART;
- Reticulation mains renewals: \$3M to \$4M (0.10% to 0.13%) – we have changed our view on the extent of reticulation mains renewal so any change in opex is not likely to be material;
- Avoid Fail sewers: \$1M to \$2M (0.03% to 0.06%) – we have changed our approach to this capex area based on new information provided. Our adjustment is based on the NSOOS sewer only;
- Impact of other reductions in the capital expenditure program: >\$10M (0.33%) – Sydney Water stated that this relates mainly to the wastewater treatment works renewals program. We have made some adjustments to our earlier capex assumptions which we discuss in Section 4.4. In addition, we commented in our December 2015 report that *'we considered applying a reduction in this [Service Delivery] trend but concluded that effective planned maintenance is essential to be able to defer some*

capital expenditure presented in the submission. We amended the expenditure forecast following Sydney Water's representations'.

We recognise that the above are risks that Sydney Water may face in the future price period; there are likely to be other risks and potential gains in the future price path which we have not reviewed. The overall quantum of these risks are of the order of 0.5% if all eventuated.

IPART has applied a consistent view across all water utilities following the current position on the electricity network charges determination. It has increased the allowance from the Draft Determination and advised us that its view on efficient electricity costs. The revised adjustment for electricity is shown in Table 2.1 below.

Table 2-1 Operating expenditure – Change to electricity cost adjustment

SYDNEY WATER EFFICIENT EXPENDITURE - REVISED AFTER MAY 2016 REVIEW					
(\$k 2015/16) year ending June	2017	2018	2019	2020	Total 2017 to 2020
EXPENDITURE SUBJECT TO EFFICIENCY ADJUSTMENTS					
Electricity	-1.95	-5.01	-5.89	-6.51	-19.36
IPART adjustment following DD	2.83	2.45	2.39	2.37	10.04
Re-profiled Electricity adjustment	0.88	-2.56	-3.50	-4.14	-9.32

2.4. Findings

Sydney Water has responded positively to the efficiency challenge made by the Draft Report and has carried out further analysis to identify more efficiencies from core operating expenditure. While we still consider there are further efficiencies to be made, which may be incentivised through the opex ECM, they are difficult to quantify and validate with sufficient certainty. We therefore accept the Sydney Water revised proposals.

IPART has advised us that its view on efficient electricity costs has resulted in a change to the efficient expenditure adjustment from -\$19.3M to -\$9.3M.

Cost risks have been identified although these have a small impact on the total future price path expenditure which we believe can be managed by a highly experienced and professional team.

2.5. Impact on Expenditure Proposals

The impact of the adjustments set out above is to increase total operating expenditure from \$2998.9M in the Draft Report to \$3032.7M. The difference comprises \$23.8M for efficiencies and \$10.0M for electricity. The summary by year is shown in Table 2-2 below.

Table 2-2 Efficient Operating Expenditure in the future price path

SYDNEY WATER EFFICIENT EXPENDITURE - REVISED AFTER MAY 2016 REVIEW					
(\$k 2015/16) year ending June	2017	2018	2019	2020	Total 2017 to 2020
SERVICE					
Water	229.6	230.7	230.5	229.2	920.0
Wastewater	506.5	505.3	501.9	497.8	2011.5
Stormwater	12.2	12.6	12.8	12.8	50.5
Bulk Water	480.5	480.0	479.2	483.3	1922.9
Recycled Water	27.2	27.1	25.7	25.8	105.8
Finance Leases	0.0	0.0	0.0	0.0	0.0
Less Rosehill Scheme	-3.1	-1.7	-1.7	-1.7	-8.2
Total Regulated Services	1252.9	1254.1	1248.3	1247.2	5002.5
EXPENDITURE SUBJECT TO EFFICIENCY ADJUSTMENTS					
Total less bulk water	772.5	774.1	769.1	764.0	3079.6
REPROFILING					
Electricity	0.9	-2.6	-3.5	-4.1	-9.3
Service Delivery Reprofile	-1.0	-2.5	-2.5	-2.5	-8.5
ADJUSTED EXPENDITURE BEFORE APPLICATION OF EFFICIENCY TARGETS					
Water	229.6	229.1	228.5	227.0	914.1
Wastewater	506.4	501.9	497.8	493.4	1999.6
Stormwater	12.2	12.6	12.8	12.8	50.5
Recycled Water	27.2	27.1	25.7	25.8	105.8
Finance Leases	0.0	0.0	0.0	0.0	0.0
Less Rosehill Scheme	-3.1	-1.7	-1.7	-1.7	-8.2
Reprofiled expenditure	772.3	769.0	763.1	757.3	3061.8
EFFICIENCY ADJUSTMENTS					
Efficiency	-0.9	-2.9	-12.0	-13.3	-29.1
EFFICIENT EXPENDITURE					
Water	229.3	228.2	224.7	222.8	905.0
Wastewater	505.8	499.9	489.6	484.3	1979.7
Stormwater	12.2	12.6	12.8	12.8	50.5
Recycled Water	27.2	27.1	25.7	25.8	105.8
Rosehill Scheme	-3.1	-1.7	-1.7	-1.7	-8.2
Total Efficient Expenditure	771.4	766.1	751.1	744.0	3032.7

3. Prudent Expenditure

3.1. Prudent Expenditure in the IPART Draft Report

In our Report³ we found one potential imprudent expenditure in the future price path where the Customer Relation Management System which was commissioned in 2011 is likely to be decommissioned in 2018 as its functions will be superseded by the new billing system, called T2020. Our view was that this asset is being decommissioned before the end of its asset life and should be considered as a stranded asset.

In 2007 Sydney Water's consultant recommended considering SAP as combined provider, which is of relevance given the path originally pursued by the Corporation was to implement Oracle's Siebel CMS solution; it is now pursuing a combined SAP solution. The consultant stated that: "... While there are limited examples of utilities implementing SAP CRM without SAP IS-U, we would recommend keeping SAP CRM in the frame for consideration at this stage. SWC could engage SAP locally to establish if they would be confident to propose SAP CRM standalone without SAP IS-U in a competitive tendering process". CMS was implemented in 2011 with a value of \$42m when it was put into the Regulatory Asset Base.

We challenged Sydney Water about the seven year asset life it had been assigned as we did not believe that this is consistent with the asset life of other comparable systems, such as now assumed for ERM and T2020. We based our adjustment of a stranded asset on a 15 year asset life when CMS is replaced in 2018 by the combined SAP IS-U and SAP CRM solution. Based on the information made available at that time, we had not identified any other assets which are likely to be stranded. There may be other assets which fall into this category in the future price path and will need to be considered at the time of the subsequent price path review.

3.2. Sydney Water Submission

The representation from Sydney Water⁴ stated that we had been inconsistent in our approach to assigning IT asset lives and we had ignored the avoided costs associated with not having to integrate our new billing system to the new CMS.

Sydney Water disputed our 15-year asset life assumption and referred to Section 8 of our report¹. It considered its decision as prudent and efficient and asked that no prudence adjustment should apply.

3.3. Review

Avoided Costs

Sydney Water stated that in developing its business case for the SAP IS-U and SAP CRM systems it considered the option of keeping and integrating the existing CMS into the new SAP platform. It estimated that it would cost an extra \$17.6M over five years to do this.

The basis of our prudence adjustment can be traced back to the original business case for CMS and our observations in the 2011 Efficiency Review⁵ about prudence and efficiency of approach. At that time we formed the view that the level of maturity of IT business planning was not very well developed. We then compared the business with a Frontier company and commented that

'we believe that the IT maturity level of a Frontier Company would lead it to follow the path of an integrated system – which is both the preference and the norm in many of the utilities with

³ Sydney Water Corporation Expenditure Review, Atkins Cardno December 2015

⁴ Sydney Water's response to IPART's Draft Report and Determination, Sydney Water April 2016

⁵ Detailed Review of Sydney Water Corporation's capital and operating expenditure, Atkins Cardno November 2011

which we are familiar. The latter approach [an integrated system] is more likely to promote best value also when considering the whole life least cost solution”.

These observations are relevant given the path pursued by the Corporation was to implement Oracle’s Siebel CMS solution rather than pursue a combined SAP solution. In other words, the avoided costs of integration would not have been relevant if a combined SAP solution had been pursued in the first place.

Regulatory Asset Lives

We based our assumption on regulatory asset life based on current Sydney Water IT life assumptions and information provided by them as part of the IT expenditure review. In Section 8 of our Report¹ we stated that

‘Sydney Water provided a schedule of asset lives for each fixed asset category. These are dated January 2014 although there have been few changes from the 2012 Determination. These changes relate toIT assets: the asset life has been extended from 10 to 15 years related to the payback period expected from new systems ...’

For the future price path, Sydney Water has provided a schedule of new IT systems to be developed in the future price path. Each system has been allocated a life of 5 or 15 years. For example most of the new billing system and ERP have assumed lives of 15 years consistent with the payback period assumed for these systems⁶.

3.4. Finding

We found that there is no further evidence to change our original view that early write-off of the CMS system was not prudent. The regulatory asset lives are based on Sydney Water’s current assumptions for specific assets. Given the size of the original expenditure we consider it appropriate to apply a specific asset life rather than the average.

3.5. Impact on the Price Control

We have made no adjustment to our original findings. We confirm the value of the adjustment in Table 3-1 below.

Table 3-1 Recommended prudence adjustment in the future price path

(\$M 2015/16) year ending June	2017	2018	2019	2020	2017-20 Total
IT CMS system- residual value of asset from planned write-off because of T2020 Customer Billing System	0.0	-24.8	0.0	0.0	-24.8

.Source: Atkins/Cardno analysis

3.6. Other Representations on IT Expenditure

We include in Appendix B our response to other representations on the IPART Draft Report related to Sydney Water’s IT proposals.

⁶ Sydney Water document ‘JJ_22-02_Analysis on Weighted Corporate IT Lives’

4. Capital Expenditure

4.1. Capital Efficiency

Efficient Expenditure in IPART Draft Report

Efficiencies were applied to all of Sydney Water's proposed capital expenditure in the future price path as follows:

Table 4-1 Future Price Path – Proposed Capital Efficiencies %

Cumulative efficiency challenge (%)				
	2017	2018	2019	2020
Continuing efficiency at the Frontier	0.25	0.5	0.75	1
Catch-up: capital program management and optimisation	0.5	1	1.5	2
Catch-up: value engineering	0.4	0.8	1.2	1.6
Catch-up: cost-estimating	0	0	0.5	1
Catch-up: procurement	2	4	4	4
Catch-up efficiency	2.9	5.8	7.2	8.6
Total efficiency	3.15	6.3	7.95	9.6

This produced an overall efficiency saving of \$155.0M or 6.2% of capital expenditure after Atkins-Cardno's recommended adjustments.

Sydney Water Submission

Sydney Water stated that it accepted \$60.4 million of the challenge arising from Atkins-Cardno's capital program efficiencies; these are the efficiencies associated with capital program management and optimisation, value engineering and cost estimation. It proposed to apply a reduction of 7% to those programs which had not previously been subject to delivery efficiency challenge, equal to \$41.6M. However, it believed there had been double-counting of catch-up efficiencies, and disputed \$38.9 million of the procurement delivery efficiencies as it considered that these were already factored into its forecasts.

Review

We have focussed our review on three areas: the overall level of capital efficiency and its application to both renewals and growth expenditure, the two areas in which Sydney Water appears to have applied delivery efficiency.

Level of capital efficiency

Sydney Water has commissioned an assessment which classified it as at a "foundation" level of maturity in 2014, aiming to progress to 'leading' status by 2017. It is putting significant efforts into procurement efficiency and expects about 4% efficiency in 2016/17 compared to recent costs⁷. Many of the major capex procurement initiatives are recent or underway, so are not 'baked in' to historical outturn costs. As such, we consider 2% procurement efficiency in 16/17 followed by 4% thereafter to be realistic targets.

The level of efficiency reportedly applied by Sydney Water to many of its programs (7%) and Atkins-Cardno's recommended overall capital program efficiency, an average of 6.2%, are close. We recommend retaining our original level of challenge, as there are a number of differences to how they have been applied; for example Sydney Water has not applied it to the whole capital program, and we have not received any information which changes our view on the appropriate level.

⁷ Sydney Water document: 'P_09-10-15_5. DF Procurement deep dive'

Renewals expenditure

We do not consider that there is potential double-counting of efficiency savings in the renewals program because the 'adjusted expenditure before application of efficiency targets' which the efficiencies have been applied to represents our view of prudent *pre-efficiency* expenditure.

Growth expenditure

We consider that there is potential for double-counting of efficiency savings in the growth program. This is because we have based the 'adjusted expenditure before application of efficiency targets' on Sydney Water's cost estimates after appropriate prudency adjustments. If Sydney Water has applied an appropriate delivery efficiency then further application of capital efficiencies could be double-counted.

Sydney Water has provided a high level breakdown of delivery efficiencies applied to growth expenditure shown in Table 4.2. We have limited confidence in the robustness of the figures as the initial forecasts for the "Sydney Water delivered" lines appear to have been derived from the 'forecast after delivery efficiency' figures, with all of the initial forecast figures precisely matching the first decimal points of their associated delivery efficiencies, leading to 2016-20 forecasts which have no remainder at one decimal point⁸.

Table 4-2 Sydney Water's breakdown of delivery efficiencies applied to growth program

		Growth portfolio - water and wastewater	Initial forecast (\$m)	Delivery Efficiency (\$m)	2016-20 forecast (\$m, after delivery efficiency)
Sydney Water delivered	Greenfield	NWGC	203.3	20.3	183
		SWGC	126.7	12.7	114
		West Dapto	26.7	2.7	24
		Other greenfield	78.9	7.9	71
	In-fill	In-fill	105.5	10.5	95
		<i>SW delivered sub-total</i>	<i>541.1</i>	<i>54.1</i>	<i>487.0</i>
Private sect delivered		Private sector delivered growth	211.7	15.7	196.0
Total efficiencies applied to Growth			752.8	69.8	683.0

Source: P2_31-01_Delivery efficiencies in the growth program

When reviewing projects and programs it was difficult to identify the delivery efficiencies which had been applied. Given the lack of clarity in how these have been applied and the limited confidence in the breakdown supplied, we recommend assuming that only half of the total efficiencies which Sydney Water claim has been applied to the growth program could be double-counted.

⁸ This suggests that the 'delivery efficiency' and 'initial forecast' figures have been derived from a set of 2016-20 forecasts which had no decimal places.

Finding

We have netted-off half of the delivery efficiencies which Sydney Water claims to have applied to its growth program, as we consider there to be potential double-counting of these efficiencies.

We recommend that, for future reviews, Sydney Water clearly documents the level, type and timing of efficiencies in order to be able to demonstrate more clearly the challenge it has applied to its program.

Impact on expenditure proposals

We recommend that the removal for double-counting be addressed as a positive pre-efficiency expenditure adjustment summarised below.

Table 4-3 Summary of Recommended Adjustments to take account of double-counting of efficiency in the growth program

(\$M 2015/16) year ending June	2017	2018	2019	2020	2017-20 Total
IPART Draft Report <u>adjustment</u> to pre-efficiency expenditure					
Efficiencies already applied to growth program- Wastewater Service Adjustment	0.0	0.0	0.0	0.0	0.0
Efficiencies already applied to growth program- Water Service Adjustment	0.0	0.0	0.0	0.0	0.0
Revised recommended <u>adjustment</u> to pre-efficiency expenditure					
Efficiencies already applied to growth program- Wastewater Service Adjustment	6.9	8.5	5.0	2.1	22.5
Efficiencies already applied to growth program- Water Service Adjustment	3.5	3.6	3.4	2.0	12.4
Revised recommended pre-efficiency expenditure allowance					
n/a					

4.2. Metering

Efficient Expenditure in IPART Draft Report

Replacement of damaged, faulty and broken meters is an essential activity in order for Sydney Water to correctly bill customers and maximise revenue. The accuracy of billing is also the biggest source of customer complaints and Sydney Water has an obligation to comply with the National Measurement Act where an accuracy of +/-4% is required.

The meter program includes for the provision of new meters, reactive meter replacement on failure and a proactive program to comply with reading accuracy. The total meter asset stock is some 1.3M of which 92% are 20mm.

In the current price path, Sydney Water is forecasting 309,500 replacement and new meters against a target of 384,400, a variance of 75,000 meters, or-24%, under output target. In the previous price path the shortfall against target was 35%. The shortfall in the current price path was attributed in part to the contractor having difficulty in retaining staff. New contracts were in place from July 2015 with two meter suppliers and meter field service contractor.

We accepted the need for new meters and reactive replacement continuing at historic rates. We challenged the basis of the 20mm proactive meter replacement as it was not consistent with the age profile of the current asset stock and the extended life measured as volume or years. We accepted the level of larger meter replacements. We took into account the under-delivery of meter replacement in the previous and current price path periods. We assumed that the increase in proactive meter replacement compared with current levels is half that proposed. We also checked this against a model of forecast replacement using the consumption thresholds assumed by Sydney Water. Our forecast showed an average meter workload 98,000 per annum.

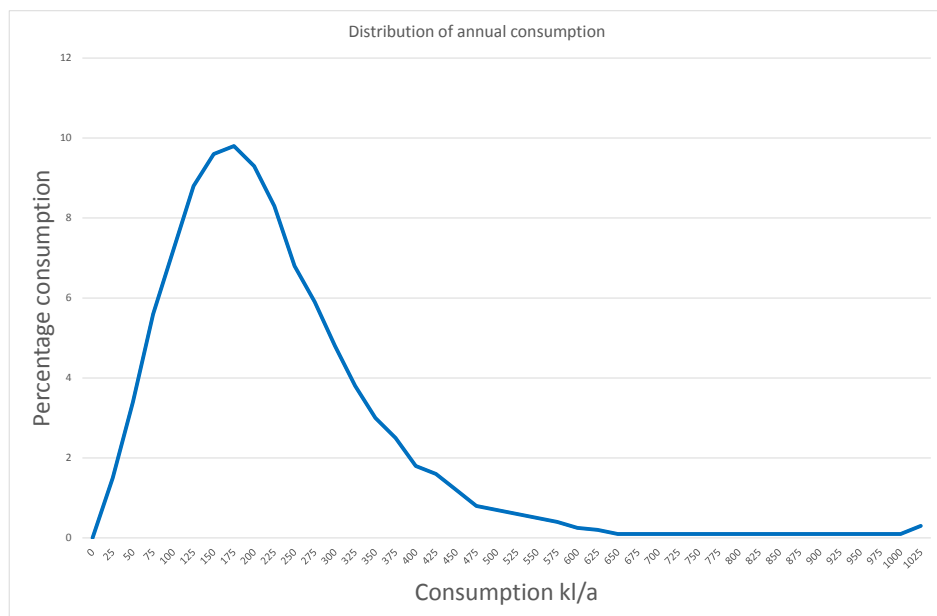
Sydney Water Submission

Sydney Water provided further information to demonstrate a higher level of 20mm household meter replacement than was assumed in the Draft Report. Meter replacement continues to be based on consumption thresholds; Elster meters are replaced at a 4100 kl/a threshold and Reliance meters at a 3500 threshold. Sydney Water also provided information to show the level of meter replacement due to age was driving an increasing level of replacement.

Review

Sydney Water presented a distribution of annual consumption distribution of 20mm household meters as shown on Figure 4.1 below. The distribution shows that while the average water use is 211 kl/a, the 95%tile is 456 kl/a. This confirms that the number of annual meter replacements, using the consumption thresholds, is greater than applying the average consumption.

Figure 4-1 Metered consumption distribution for 20mm household meters

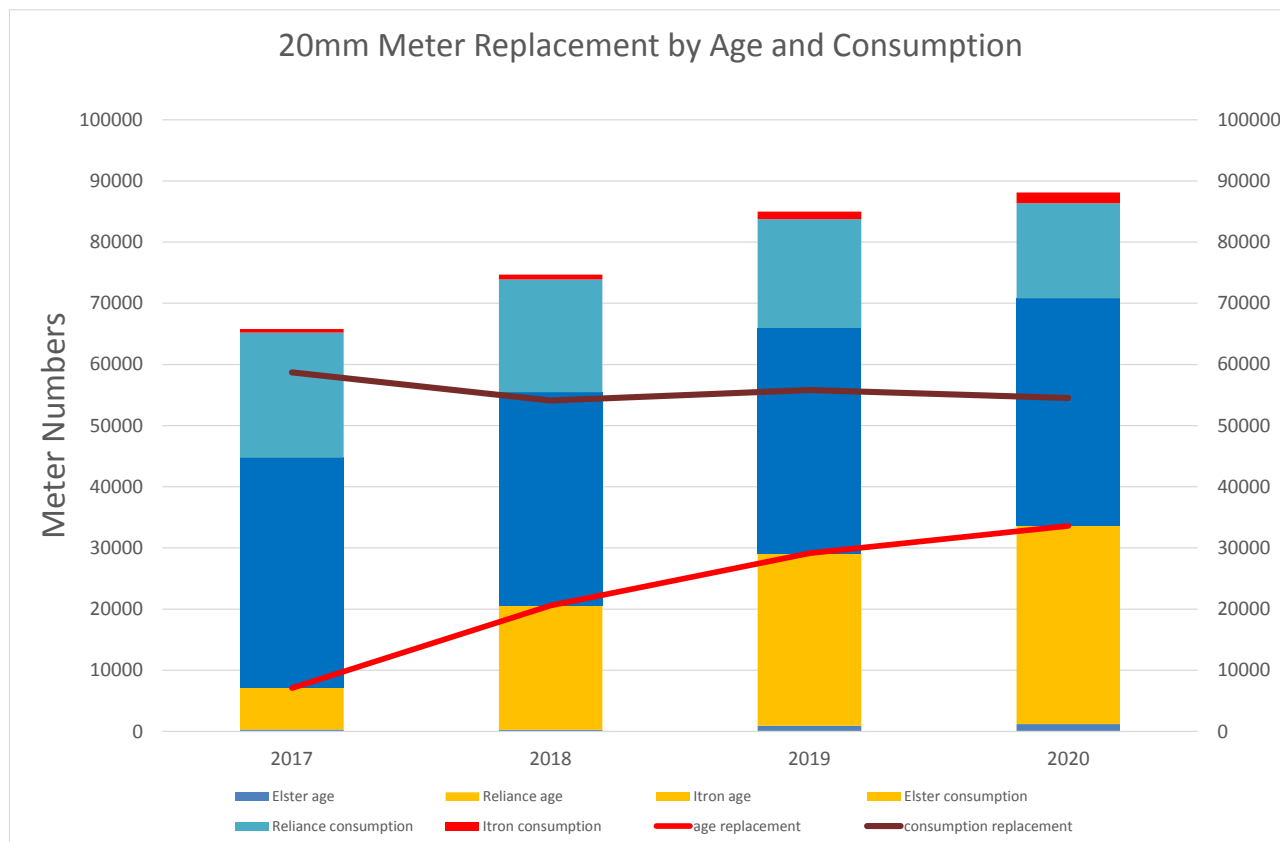


Source: Sydney Water document P2_04.01 Metering response

Sydney Water also showed that the age criteria has an increasing impact on the number of replacements in the future price path. This is because for meters where total consumption has not met the volume criteria, the age replacement assumption of 20 years for the Elster meters and 15 years for Reliance meters, is driving an increasing level of replacement over the future price path.

This age-driven replacement profile is shown in Figure 4.2 increasing from 7,100 in 2017 to 33,600 in 2020. Meter replacement driven by consumption shows an even trend of an average 55,000 per year over the price period.

Figure 4-2 20mm Household Meter Replacement by Age and Consumption Drivers



Source: Sydney Water document P2_04.01 Metering response

We noted that the forecast new and replacement meters for the year ending June 2016 is c 88,000 compared with the 98,000 assumed in the current price path. This under-delivery was attributed to the extension of meter life for the Elster meters.

The forecast meter replacement program and expenditure is shown in Table 4-4. This shows a significant increase in meter activity from 104,000 in 2017 to 122,000 in 2020 mainly driven by the Reliance age replacements. Forecast of new meters and reactive replacement are based on historical trends. Proactive replacement of the 20mm meters is based on the Sydney Water modelling of consumption and age. Replacement of larger meters is from historic trends. Difficult meters are identified where more work is needed for meter replacement above the normal activity; these attract additional costs which have been included in the composite replacement rate.

We questioned the achievability of the enhanced programme. We formed the view that the meter replacement program is a low technology and repetitive activity that could be scaled up with appropriate resources. We have therefore not made any adjustment for achievability but recognise that management needs to be focused to deliver the program.

Table 4-4 Revised Meter Program Activities and Expenditure

SYDNEY WATER REVISED PROPOSAL					
New install	17306	17480	17655	17831	70272
Reactive replacement	11896	12430	12289	12975	49590
Proactive replacement 20mm	63037	73806	81125	80749	298717
proactive replacement >20mm	4934	4896	2804	2604	15238
Difficult meters	6987	7537	7643	7699	29866
Total meters	104160	116149	121516	121858	463683
Pre-efficiency expenditure \$M	9.7	10.3	10.4	10.5	40.9

Source: Sydney Water document P2_04.01 Metering response

Finding

We accept Sydney Water's latest proposals for the metering program. There is a marginal reduction in replacement activity compared with the earlier 2015 proposals.

Impact on expenditure proposals

The impact on the Sydney Water expenditure proposals presented in its 2015 Submission are shown in Table 4-5 below.

Table 4-5 Summary of Revised Capital Expenditure Recommendations: Metering

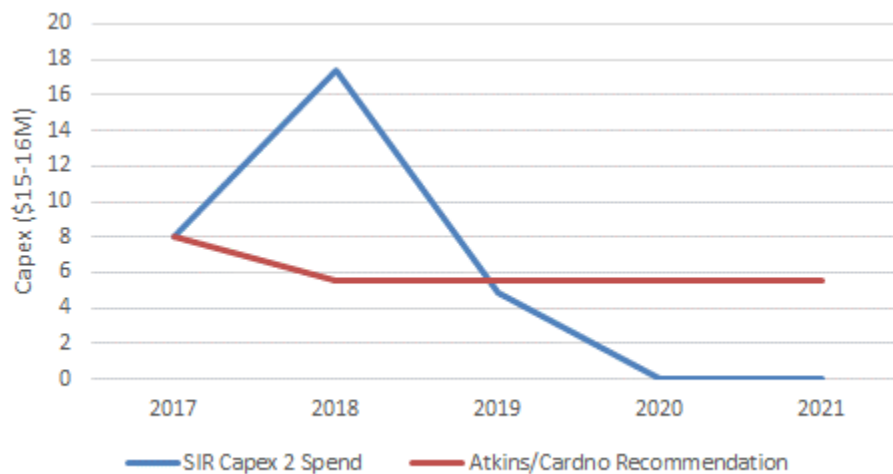
(\$M 2015/16) year ending June	2017	2018	2019	2020	2017-20 Total
IPART Draft Report <u>adjustment</u> to pre-efficiency expenditure					
Metering	-1.4	-1.9	-1.9	-1.9	-7.1
Revised recommended <u>adjustment</u> to pre-efficiency expenditure					
Metering	-0.3	-0.3	-0.1	0.0	-0.7
Revised recommended pre-efficiency expenditure allowance					
Metering	9.7	10.3	10.4	10.5	40.9

4.3. North West Growth Centre

Efficient Expenditure in IPART Draft Report

Sydney Water proposed to deliver infrastructure for North West Growth Centre (NWGC) by 2018/19. Given the historical tendency for projections to be higher than outturn greenfield growth, the potential to phase the roll-out of infrastructure and Sydney Water's risk-based servicing approach, we re-profiled the NWGC expenditure over five years rather than three, whilst keeping 2017 projections constant, assuming that the roll-out is complete in 2021 as summarised below.

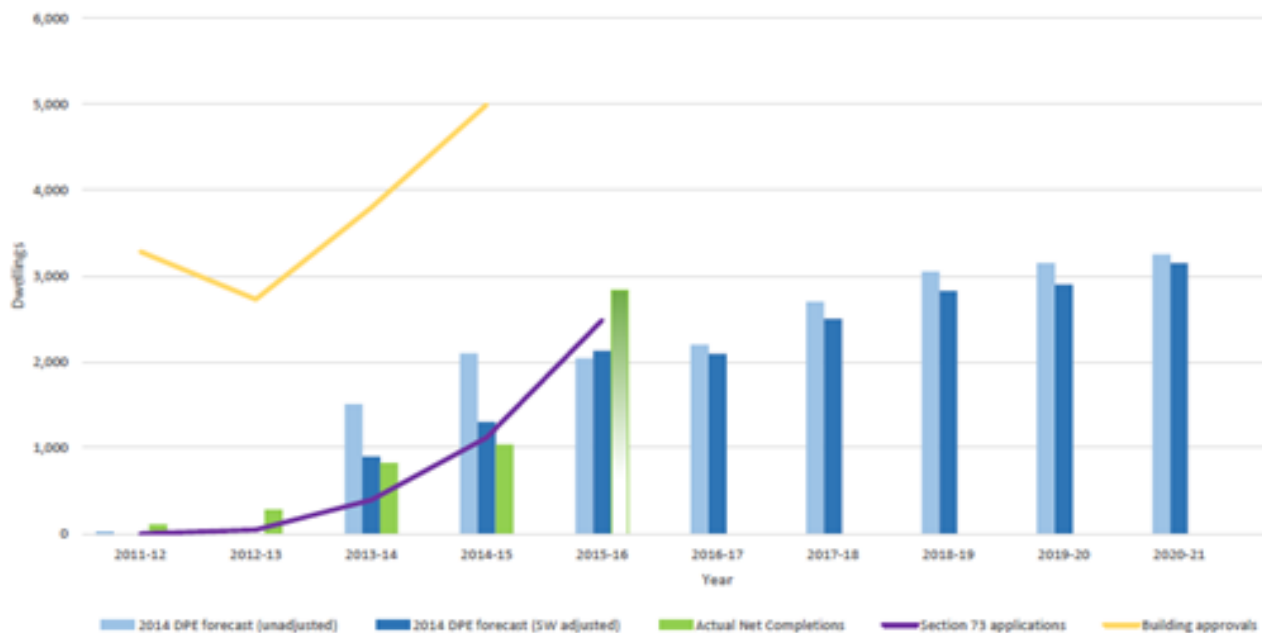
Figure 4-3 Reprofiting of NWGC water service expenditure in IPART Draft Report (pre-efficiency)



Sydney Water Submission

In its response to IPART's draft report, Sydney Water stated that NWGC growth is now ahead of, rather than behind, forecast and it had already assumed some commercial risk in later years. It provided updated development rates taking account of outturn 2015-16 development activity (presented below).

Figure 4-4 Sydney Water's updated development outturn and projections for NWGC



Source: Sydney Water presentation 'P2_08-01_290416 NWGC Data'

Review

As part of our review we asked for maps of development activities at land parcel level around the proposed lead-in locations.

Our review of the information provided found that development has now accelerated in NWGC with evidence to show that development is at an advanced stage in the areas which would be served by the proposed lead-in investments.

Finding

Given the acceleration of development in the NWGC and signs of advanced development activity in land parcels to be served by the lead-ins, we are now supportive of Sydney Water's proposed investment in line with its original Pricing Submission.

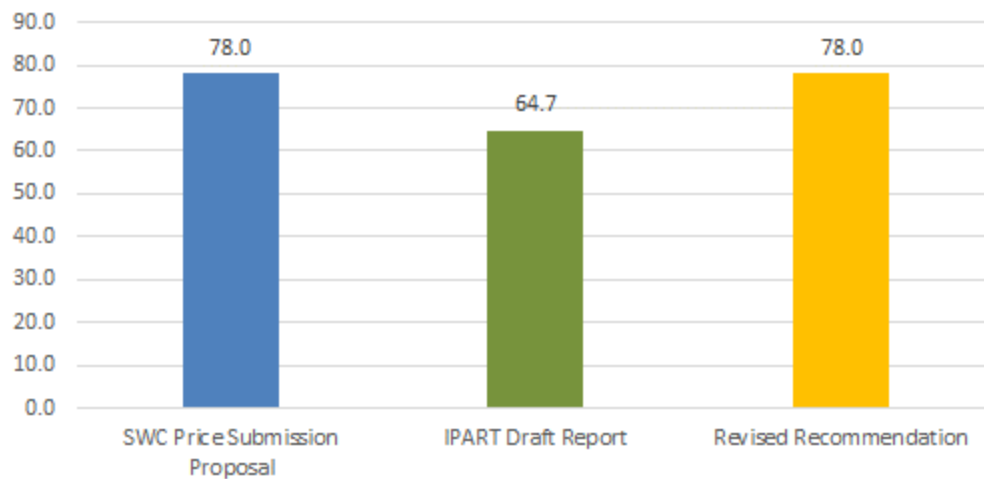
Impact on expenditure proposals

We recommend that the previous adjustment now be removed as summarised below:

Table 4-6 Summary of Revised Capital Expenditure Recommendations: NWGC

(\$M 2015/16) year ending June	2017	2018	2019	2020	2017-20 Total
IPART Draft Report <u>adjustment</u> to pre-efficiency expenditure					
NWGC Wastewater Service Adjustment	0.0	-7.1	-7.9	7.3	-7.8
NWGC Water Service Adjustment	0.0	-11.9	0.7	5.6	-5.6
Revised recommended <u>adjustment</u> to pre-efficiency expenditure					
NWGC Wastewater Service Adjustment	0.0	0.0	0.0	0.0	0.0
NWGC Water Service Adjustment	0.0	0.0	0.0	0.0	0.0
Revised recommended pre-efficiency expenditure allowance					
NWGC Wastewater Service	16.6	14.9	15.7	0.5	47.6
NWGC Water Service	8.1	17.4	4.9	0.0	30.4

Figure 4-5 Revised capital expenditure recommendation: NWGC (pre-efficiency)



4.4. Wastewater Treatment Works Renewals

Efficient Expenditure in IPART Draft Report

Our recommendations for expenditure reflected a focus on considering the service performance outcomes of programs as evidenced by the various internal and external targets and licence criteria. Sydney Water maintains an asset-centric approach to renewals based on asset condition assessments and estimates of remaining service life. Our methodology focused on serviceability of assets in delivering outcomes to customers and the environment. We tested the assumption that the future is the same as the past in looking at the performance of wastewater plants against environmental licence parameters, enforcement related to serviceability and not operational performance, and trends in work orders for unplanned maintenance.

In our review, we assessed the expenditure that delivered the current performance levels in relation to breakdown work orders and EPL licence breaches related to asset serviceability. We recommended on-going expenditure based on these historical levels. Our review considered the Quaker's Hill project separately to the base renewals program as it is essentially an exceptional project. Sydney Water describe the project as essentially a full rebuild of the treatment plant. We recognise the integrated system planning that has been undertaken for this project with the nearby St Marys and Riverstone WWTPs, to develop an optimised approach to collection and treatment of wastewater and biosolids.

Sydney Water Submission

Sydney Water's submission maintains the focus on renewals based on asset condition and estimated remaining life of the assets creating an unacceptable performance risk. The renewals program is developed using an "industry sense check" which assumes a treatment plant has a full replacement cycle of 33 years and therefore the long term renewals rate should be 3 per cent of the replacement value of assets. Specific needs are identified through asset condition assessments and estimates of remaining life.

Sydney Water provided details of projects comprising the \$290M expenditure by status with

- \$114.2M (39%) 'active' projects which are ready to proceed or underway;
- \$59.8M (21%) 'candidate' projects where the initiation is approval but have yet to be scoped;
- \$103.8M (36%) funded concepts where projects have been identified but have yet to be approved; and
- \$12.2M (4%) are reactive where work is unplanned but require immediate completion.

Sydney Water submits that all projects in the program are required to be undertaken and any adjustments will defer projects to the next regulatory period, increasing risk and the expenditure required in future periods. Sydney Water provided further detail on the breakdown of historical expenditure indicating that a number of large and ongoing projects have been rolled up into the WWTP renewals spend in the current price path. Specifically, this included the Malabar WWTP which is on-going in the next price path period.

Review

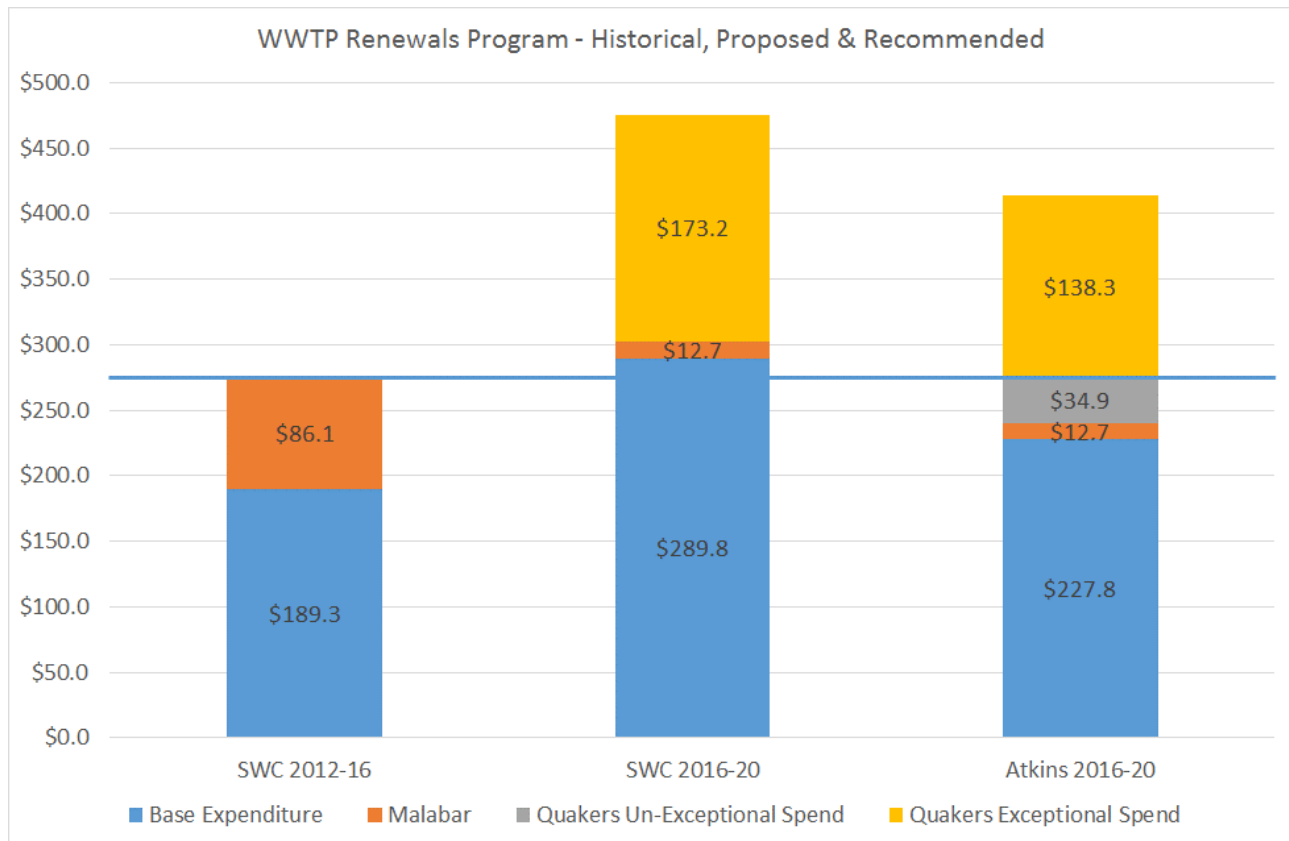
We have reviewed our earlier findings to take account of additional information provided by Sydney Water. Our revised approach is demonstrated in Figure 4-6 and explained in the following paragraphs.

We have taken the \$275.4M spend in 2012-16 as a base level of expenditure. The base includes spend on Malabar WWTP of \$86.1M and on the typical renewals work (covered by the allocation) of \$189.3M⁹. The proposed spend on Malabar WWTP in 2016-20 is \$12.7m and while separately identified, is considered typical renewals work that would be covered by the allocation. We found that serviceability measures available to us such as work orders and asset-related licence performance did not show any material change over the current price path. We found that there was no evidence to suggest that expenditure in the future price path should differ from current expenditure, subject to any exceptional expenditure.

The proposed spend of \$173.2M on Quakers Hill in 2016-20 is essentially a complete rebuild and would be predominantly considered exceptional work not normally covered by renewals allocation. However some of this expenditure would be already be allocated for on-going renewals at Quakers Hill. Sydney Water have estimated the 30 year asset renewal cost to be approximately \$69.8M (refer WWTP Renewals Program BC 2015-20). This expenditure would need to be brought forward to enable renewals. We have assumed that approximately half of this expenditure would be deferred if major renewals are completed now so we have brought forward \$34.9M to the next price period. This \$34.9M for Quakers Hill is therefore considered part of the base renewals program. The remaining expenditure for Quakers Hill (from the \$173.2M proposed) is considered to be exceptional expenditure and has been considered separately; we have made no scope adjustment to the Quakers Hill project. .

⁹ Includes \$1.0M spend on Quakers Hill in the current price path

Figure 4-6 Approach to re-calculating WWTP Renewals expenditure allowance (\$M)



We have therefore calculated the base renewal program, excluding Malabar and Quakers Hill, for 2016-20 to be:

- Base expenditure of \$275.4M carried forward from 2012-16;
- Subtract proposed spend of \$12.7M for Malabar WWTP;
- Subtract estimated \$34.9M of "already allocated" renewals for Quakers Hill WWTP;
- Leaving \$227.8M in 'base' WWTP renewals expenditure for 2016-20.

Comparing our calculated figure of \$227.8M against Sydney Water's proposed spend of \$290.0M leaves a recommended adjustment of -\$62.0M. This adjustment reflects the uncertainties in scope and timing of some of the program. The adjustment is the equivalent of deferring 60% of the 'concept' projects to the next price period, where these have yet to be scoped and appraised, or assuming a program over nearly five years compared with the four proposed.

Finding

We maintain our view and approach that leading businesses are focussing on service performance outcomes as a key indicator for expenditure levels and that this is consistent with international asset management standards. On this approach, we maintain the view that Sydney Water has not sufficiently demonstrated the need for a significant increase in renewals expenditure.

Impact on expenditure proposals

We recommend that the previous adjustment now be revised as summarised in Table 4.7 below.

Table 4-7 Summary of Revised Capital Expenditure Recommendations – WWTP Renewals

(\$M 2015/16) year ending June	2017	2018	2019	2020	2017-20 Total
IPART Draft Report <u>adjustment</u> to pre-efficiency expenditure					
WWTP Renewals	-22.6	-22.6	-26.1	-30.1	-101.5
Revised recommended <u>adjustment</u> to pre-efficiency expenditure					
WWTP Renewals	-12.8	-12.8	-16.2	-20.2	-62.0
Revised recommended pre-efficiency expenditure allowance					
WWTP Renewals	56.9	56.9	56.9	56.9	227.8

4.5. North Head Biosolids

Efficient Expenditure in IPART Draft Report

North Head WWTP is Sydney Water's second biggest wastewater treatment plant. There are currently three digesters on site. In its price submission, Sydney Water proposed to construct two additional units, adding approximately +65% to digester capacity, or +100% in the planning scenario with one of the digesters out of service.

We considered that it had not made a strong case that a single additional digester would not be sufficient to cope with anticipated demand in the medium term, for the next price path plus five years. We therefore made an adjustment to the total pre-efficiency challenge expenditure allowance for this project of a third, which is \$13.3M.

Sydney Water Submission

Sydney Water reiterated its view that two additional digesters are required because the investment is intended to improve reliability as well as to increase capacity for growth. It also disputed the adjustment of \$13.3M. It stated that review of the West Camden biosolids project showed the difference in cost between one and two digesters was less than \$3.0 million due to the set-up and indirect costs.

Review

Our review focussed on a number of issues summarised below:

Other factors affecting performance

In addition to digester capacity, Sydney Water has proposed measures to improve biosolids performance at North Head.

Sydney Water's process capability assessment (PCA) for North Head¹⁰ highlights that current performance is affected by factors beyond digester volume, such as thickening and mixer function. We are supportive of the works to address these factors which the PCA indicates will improve existing digester capacity and performance.

¹⁰ North Head WWTP – Process Capability Assessment (03 August 2015), prepared by an Integrated Planning Team consisting of personnel from Sydney Water and its panel consultants AAJV and ENSureJV

In particular, recuperative thickening appears to be a key constraint on current performance and capacity, with the PCA stating that “*current recuperative thickening configuration limits digested sludge TSR*”. Sydney Water’s proposed investment envisages a number of measures, which we are supportive of, to improve thickening of sludge, including additional rotary drum thickener capacity and dedicated recuperative thickening with polymer dosing.

Likewise, the PCA indicates that Sydney Water was rectifying one of the non-functional mixers in 2015. We also note that the Formal Warning from the EPA for this site in 2015 appears to be related to incorrect wiring by a contractor during maintenance rather than asset capacity, reliability or condition.

The benefits of these improvements are expected to be significant, with the PCA anticipating that optimised recuperative thickening would increase the capacity of two digesters by nearly 30% from 29 to 37 tonnes per day¹¹. Given that we have made no adjustment to this element of the proposed project we consider that it is reasonable to assume that the associated improvements will be in place when considering the case for additional digester capacity.

These reliability and performance benefits may also be enhanced by the large renewals investments envisaged at this WWTP: \$45.7M in the next price path¹².

Planning scenario

We consider that Sydney Water has adopted a conservative planning scenario which significantly affects the timing of the need for two additional digesters.

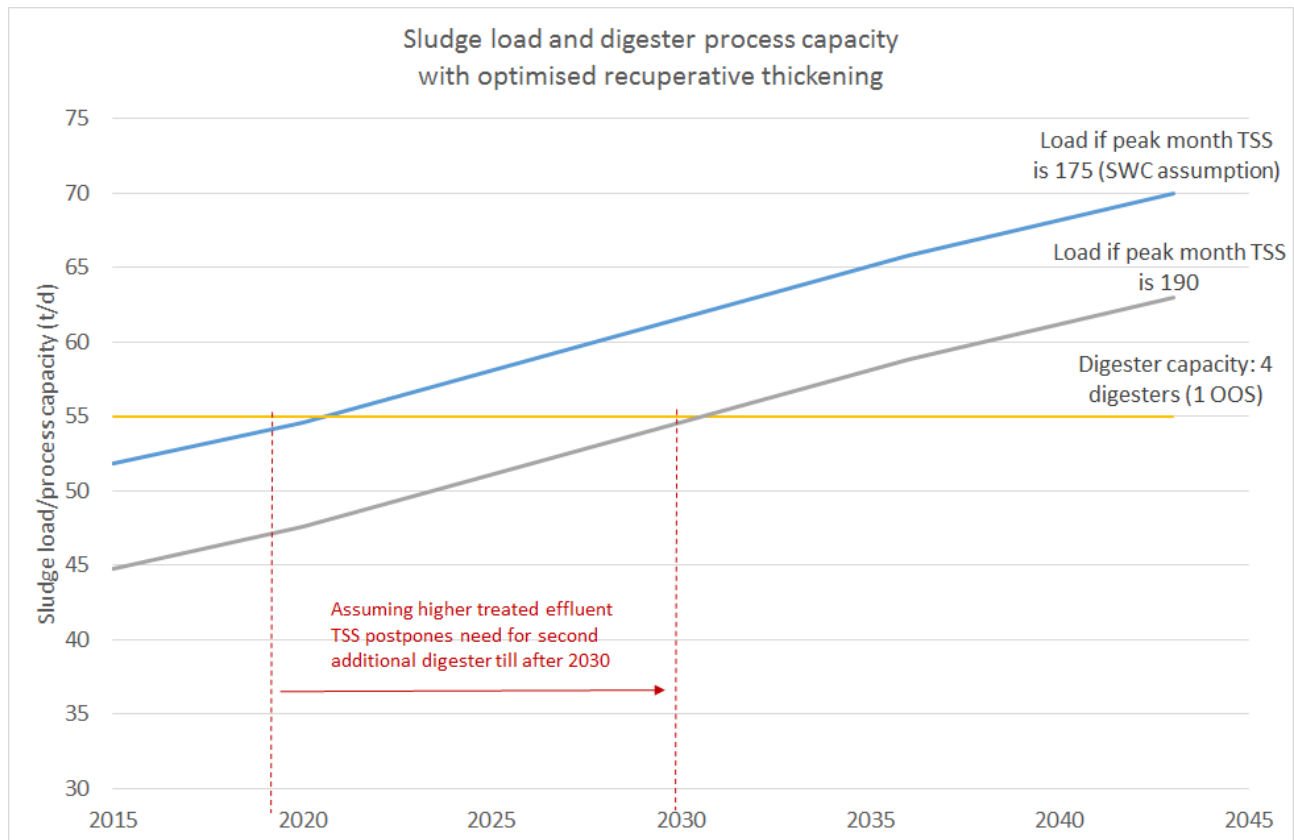
The solids load to the digesters is a function of the performance of the solids removal at the treatment plant, with higher solids loads to the digesters associated with lower total suspended solids (TSS) in the treated effluent.

The justification for two additional digesters is based on assumed treated effluent TSS of 175mg/l in the peak month. This seems conservative, in terms of sludge loads, given the historical overall median TSS is 186 mg/l, which it is reasonable to assume would be higher in the peak month, with growth expected to increase this further. The choice of treated effluent quality in the peak month makes a significant difference to the timing of the need for an additional digester as summarised below.

¹¹ At the design standard (15 day retention time), see Table 5-25 of the PCA

¹² See Table 6-18 of Sydney Water’s response to IPART’s Draft Report and Determination, 18 April 2016

Figure 4-7 Assuming that the treated effluent quality is better than the historical median significantly affects the urgency of a second additional digester



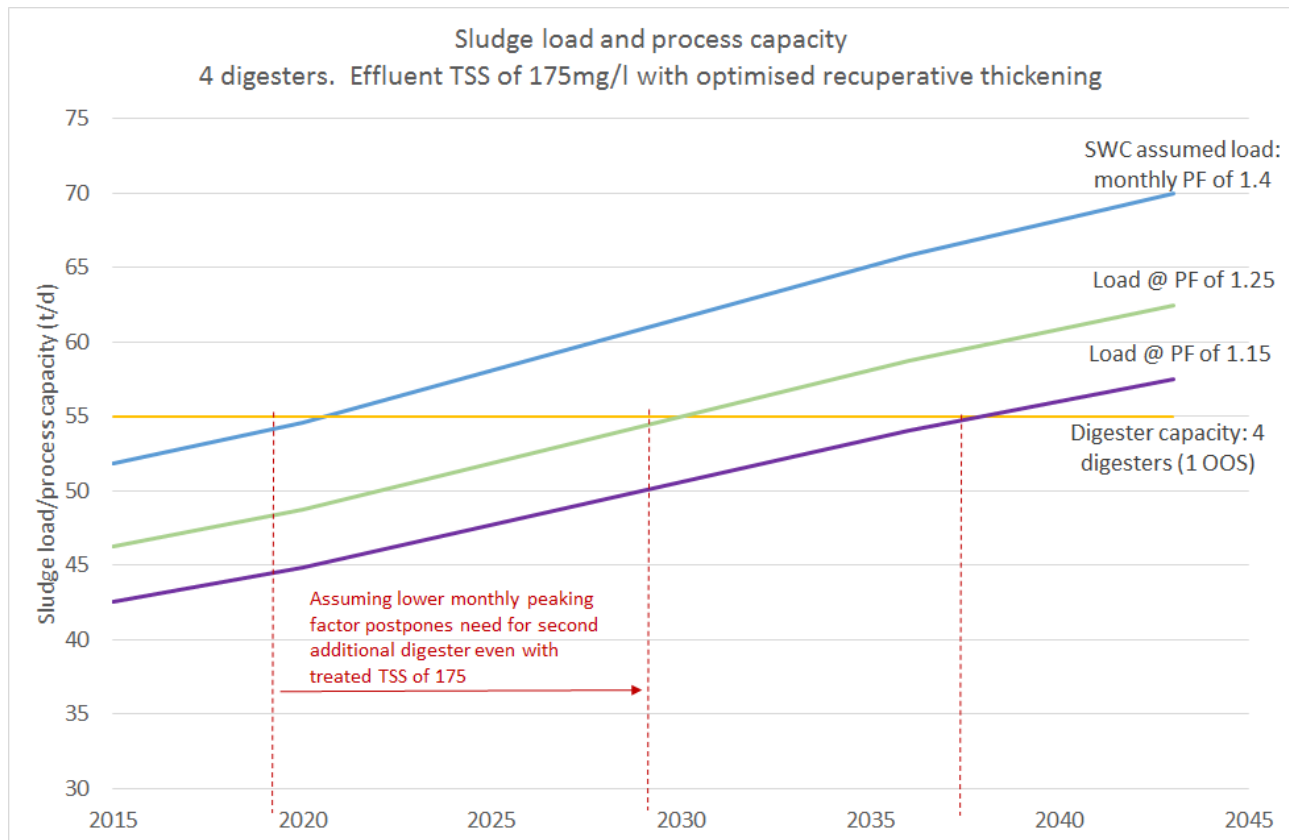
The planning scenario used to derive the loading to the digesters assumes a monthly peaking factor of 1.4, which appears high for a month-to-year uplift in biosolids loading for a large wastewater treatment plant. The PCA states that this is based on “alternative analysis using the influent suspended solids”. It is significantly higher than the peaking factors for raw sludge derived as part of the 2014 Coastal Biosolids Options Study¹³, quoted in the PCA as:

- Primary sludge peaking factor: 1.15
- Maximum month peak factor: 1.15
- Peak week peak factor: 1.38

The choice of peaking factor makes a significant difference to the timing of the need for an additional digester as summarised below.

¹³ Document referenced in PCA, but not reviewed by Atkins/Cardno

Figure 4-8 A lower monthly peaking factor significantly pushes back the need for a second additional digester even assuming a treated effluent TSS of 175



The PCA also states that the West Hornsby WWTP currently discharges approximately 2.2 TDS/d of digested sludge to North Head WWTP as the West Hornsby dewatering centrifuge is currently unavailable and the second digester is out of service. Given that Sydney Water proposes to spend c\$12M on renewals at West Hornsby¹⁴, headroom may be made available in the North Head digesters when this discharge is reduced or stopped.

Cost estimation

Sydney Water has provided a disaggregated cost estimate for the proposed works based on two digesters, dated 23 November 2015¹⁵. It includes the cost of digesters, SCADA, electrical works, rotary drum thickeners, screw presses, conveyor upgrades and a new polymer plant. The digesters themselves make up just over half of the direct costs.

The indirect cost estimates are all based on a percentage of the direct costs rather than lump sums. To derive the adjustment due to one digester rather than two we have therefore applied a 26% reduction to Sydney Water's price submission estimate, based on the direct costs of a single digester as a proportion of total direct costs. This gives a total of \$9.2M less than in the price submission.

This costing method specific to this project appears to be more appropriate than the use of a reported incremental cost for West Camden WWTP which is likely to differ in dimensions and design.

¹⁴ See Figure 6-7 of Sydney Water's response to IPART's Draft Report and Determination, 18 April 2016

¹⁵ Sydney Water document 'P2_20-01_Attachment 8 151117 TOTAL CEP Minimum'

Finding

We consider that Sydney Water has not made a sufficiently robust case that, along with other proposed improvements at this site, construction of two additional digesters over the next price path period is required.

We have used the cost estimate provided during this review to amend the estimate of the cost impact of a single additional digester, leading to a pre-efficiency adjustment of -\$9.2M, rather than -\$13.3M, in the future price path.

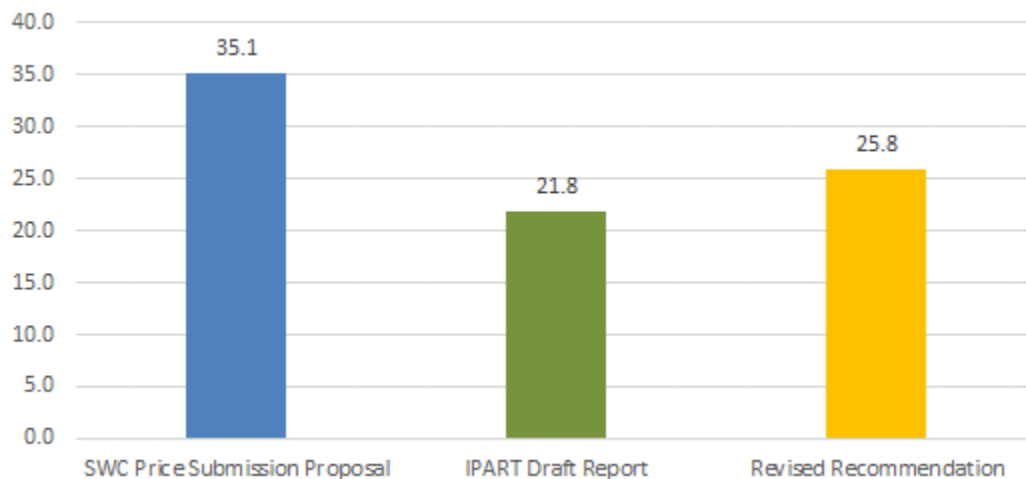
Impact on expenditure proposals

We recommend that the previous adjustment now be amended as summarised below:

Table 4-8 Summary of Revised Capital Expenditure Recommendations- North Head Biosolids

(\$M 2015/16) year ending June	2017	2018	2019	2020	2017-20 Total
IPART Draft Report <u>adjustment</u> to pre-efficiency expenditure					
North Head Biosolids- adjustment	0	-13.3	0.0	0.0	-13.3
Revised recommended <u>adjustment</u> to pre-efficiency expenditure					
North Head Biosolids- adjustment	-3.3	-5.9	0.0	0.0	-9.2
Revised recommended pre-efficiency expenditure allowance					
North Head Biosolids	9.2	16.6	0.0	0.0	25.8

Figure 4-9 Revised capital expenditure recommendation: North Head WWTP Biosolids Amplification (pre-efficiency)



4.6. Avoid Fail Sewers

Efficient Expenditure in IPART Draft Report

Our recommendations on the efficient expenditure for this renewal program were based on the success of current approaches to deferring expenditure including:

- Use of sacrificial alkali gel as a short term protector against corrosion to extend asset life;
- Challenges to condition assessment outcomes and recommendations;
- Implementation of corrosion and odour control strategies.

In our view, Sydney Water did not provide sufficient evidence to justify the proposed increase in expenditure above the current price path.

This program in the SIR includes the Northern Suburbs Ocean Outfall System (NSOOS) project, which is the largest project in this program. We had assumed, due to inconsistent naming of line items in the SIR, that the project was separately identified. We suggest that the NSOOS project is separately identified in the SIR because of the value of the proposed expenditure.

Sydney Water Submission

Sydney Water provided further detailed information on the make-up of the renewals program including, importantly, that expenditure for the NSOOS project was actually included within the renewals program. The breakdown of expenditure provided indicated that the NSOOS project makes up almost half of the entire avoid fail sewer renewals program. A current program of works, prepared for Sydney Water by a consultant, was submitted which indicated significant expenditure requirements each year from 2015/16 to 2030/31.

Sydney Water further submitted that the wider use of sacrificial alkali gels was not possible with the cost of application deemed to be higher than the cost savings from deferring renewals expenditure. Further analysis of these initial findings was being undertaken.

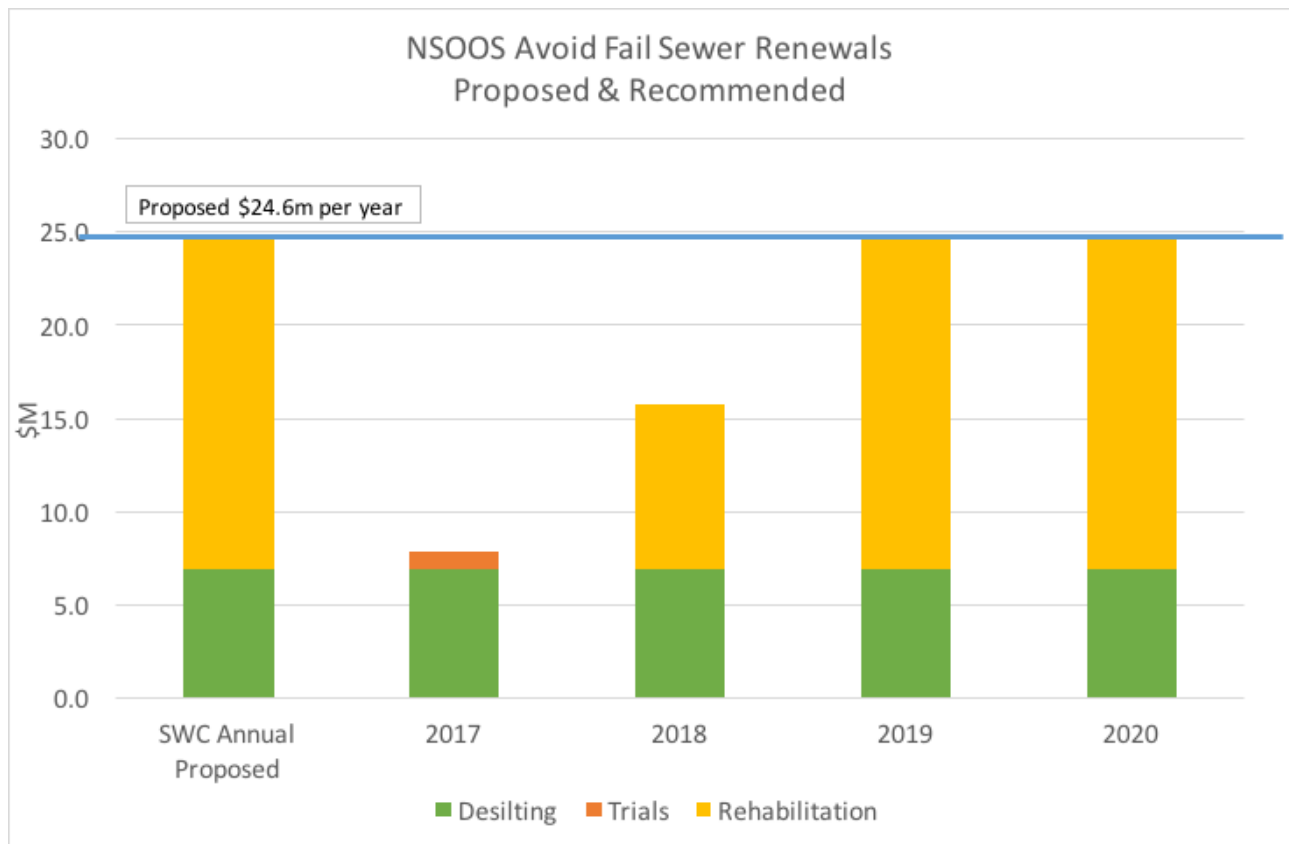
Sydney Water further stated that the benefits of the odour and corrosion control strategy would not likely be seen until beyond 2020.

Review

We undertook a review of Sydney Water's information supplied around the important NSOOS project, particularly around the revelation that the project would be fully funded from within the renewals program. Given this separation of the NSOOS project expenditure, we undertook a more detailed investigation of the project. We identified that the project is essentially based around three stages of works – tunnel access rehabilitation (includes manholes, ladders, platforms and railings), de-silting and finally tunnel/sewer rehabilitation. The program of works was developed within the criteria of around \$30-35M of expenditure annually. This is somewhat different to the proposed expenditure request included in the SIR of around \$24.6M annually across the next regulatory period. Upon request, Sydney Water also provided an update to the current year's expenditure (2015/16) indicating that it is approximately 5% over budget.

While the current progress against budget is on-track, the next stages of work are very complex with de-silting and tunnel / sewer rehabilitation works required. We consider the current program to be optimistic given the risk of working in confined spaces. Some trials of de-silting and rehabilitation methods have been undertaken; however we consider that further work is required. In particular, we are of the opinion that in-situ trials are required to demonstrate and assess the efficiency, safety and effectiveness of the proposed approaches; specifically, desilting and the rehabilitation works. We have therefore proposed a staged program of expenditure to facilitate this with this program shown in Figure 4-10.

Figure 4-10 Approach to re-calculating NSOOS Avoid Fail Sewer Renewals expenditure allowance



Finding

We accept Sydney Water's assertions that the potential avenues for achieving efficiencies, as assumed in the Draft Determination report, are limited, however with the separate identification and subsequent more detailed analysis of the NSOOS project, we have concern over the initial implementation of the proposed rehabilitation approaches. We are proposing a brief staged implementation process in the first two years of the next price path with expenditure as proposed by Sydney Water in the latter two years in the price path.

Our revised approach leads to the deferral of approximately \$25.5m from the next regulatory period beyond 2020.

Impact on expenditure proposals

We recommend that the previous adjustment now be amended as summarised in Table 4-9 below.

Table 4-9 Summary of Revised Capital Expenditure Recommendations – Avoid Fail Sewer Renewals

(\$M 2015/16) year ending June	2017	2018	2019	2020	2017-20 Total
IPART Draft Report <u>adjustment</u> to pre-efficiency expenditure					
Avoid Fail Sewer Renewals	-8.1	-6.7	-8.4	-11.0	-34.3
Revised recommended <u>adjustment</u> to pre-efficiency expenditure					
Avoid Fail Sewer Renewals	-16.7	-8.8	0.0	0.0	-25.5
Revised recommended pre-efficiency expenditure allowance					
Avoid Fail Sewer Renewals	36.7	43.1	53.7	56.3	189.8

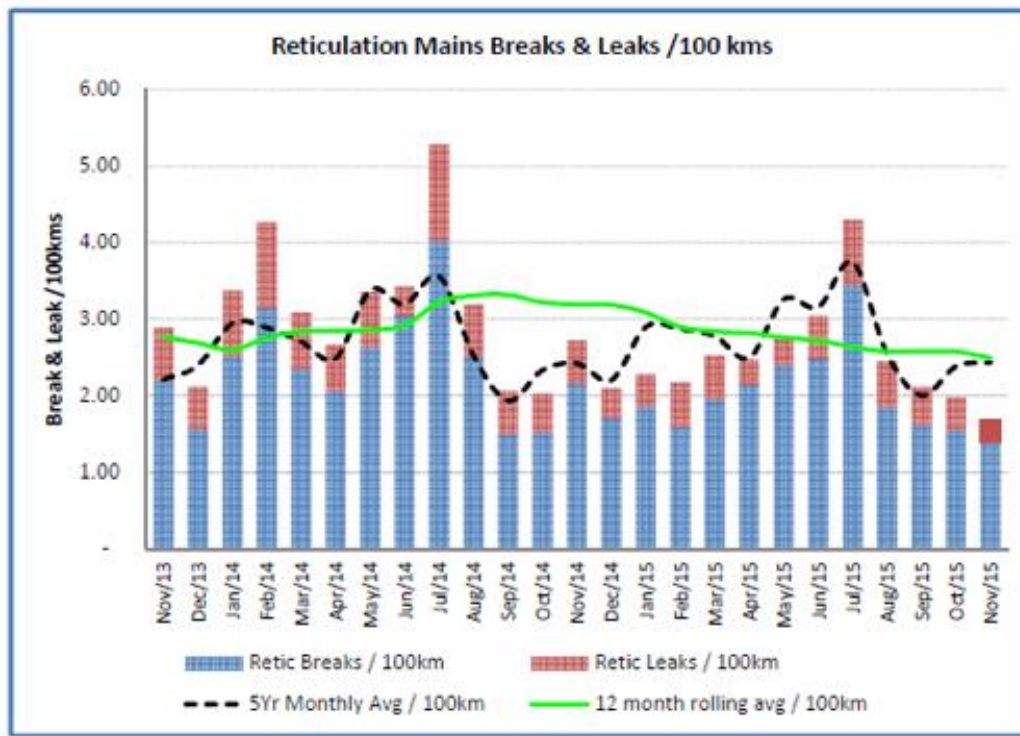
4.7. Reticulation Mains Renewals

Efficient Expenditure in IPART Draft Report

Our recommendations for expenditure reflected a focus on considering the service performance outcomes of programs as evidenced by the various internal and external targets and licence criteria. Sydney Water maintains a more asset centric approach to renewals based on asset condition assessments and estimates of remaining service life.

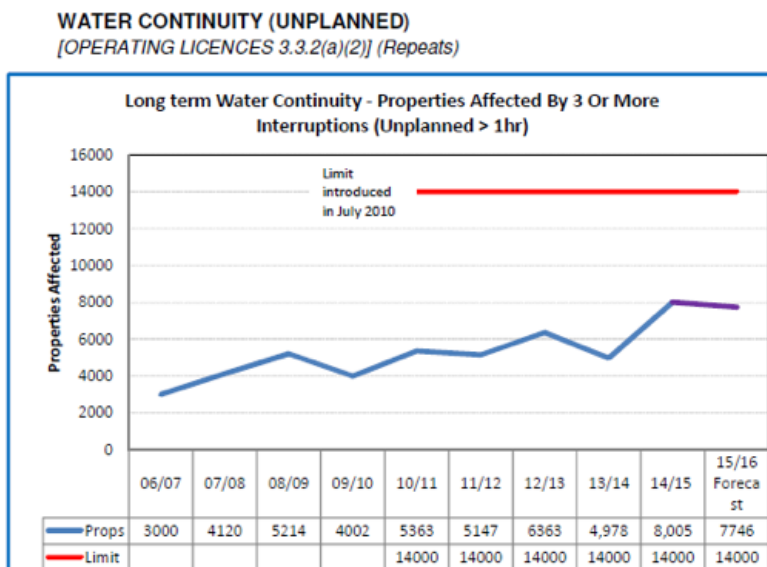
In our review, we assessed the expenditure that delivered the current performance levels, in relation to water continuity / unplanned interruptions and the rates of breaks and leaks, and recommended on-going expenditure based on these historical levels. Our review highlighted that expenditure over past price path periods has decreased by 45% however service performance has generally not decreased. This is shown in Figure 4-11 which shows a reducing trend in mains burst rates.

Figure 4-11 Trend in reticulation mains breaks and leaks



There was also evidence of a continuing headroom in properties affected by three or more interruptions against the licence measure as shown in Figure 4-12 below.

Figure 4-12 Water continuity – performance against operating licence measure



Sydney Water Submission

Sydney Water's submission maintains the focus on renewals based on asset condition and estimated remaining life of the assets creating an unacceptable performance risk. The renewals program is made up of mains that experience three breaks in a two year period. The early years of the program are based on actual mains scheduled for renewal while a funding envelope covers future years based on analysis of the asset population. A net present value analysis is conducted for each main scheduled for renewal to determine if the NPV is greater than 1; if so, the main is scheduled for renewal. In relation to service performance standards, Sydney Water submit that the targets we have used as performance measures are only minimum standards and do not represent an efficient level of investment.

Review

While we understand Sydney Water's position that the targets we have used as the basis for assessing service performance might represent minimum standards, our view remains that the performance against operating licence measures should be the main driver for investment. This is a common approach applied by England and Wales water companies. Investment in assets should be assessed to ensure services to customers is maintained.

We have not changed our methodology applied in the Draft Report but have updated our calculation of the average expenditure which delivered the service performance in the current price path. Sydney Water's latest estimate of expenditure for 2015-16 is \$39.8M. We have not had the opportunity to confirm that this expenditure is prudent and efficient, although for expediency have accepted this.

Finding

We have maintained our position that service performance should be a key driver for investment and we have updated our calculation of average renewal expenditure to account for the latest historical data.

Impact on expenditure proposals

We recommend that the previous adjustment now be amended as summarised in Table 4-10 below.

Table 4-10 Summary of Revised Capital Expenditure Recommendations – Reticulation Main Renewals

(\$M 2015/16) year ending June	2017	2018	2019	2020	2017-20 Total
IPART Draft Report <u>adjustment</u> to pre-efficiency expenditure					
Reticulation Main Renewals	-6.5	-6.5	-6.5	-6.5	-26.1
Revised recommended <u>adjustment</u> to pre-efficiency expenditure					
Reticulation Main Renewals	-1.2	-1.2	-1.2	-1.2	-4.9
Revised recommended pre-efficiency expenditure allowance					
Reticulation Main Renewals	32.3	32.3	32.3	32.3	129.2

5. Asset Lives

IPART Draft Report

In Section 8 of our Report¹ we commented on Sydney Water's asset classification and asset lives. In Section 9 we reviewed the asset lives which Sydney Water proposed for the valuation of its finance leases. We found that

- i. *The civil assets at the Prospect, Macarthur and Wyuna plants are relatively low when compared with Sydney Water's similar assets and other company assumptions. These assets are generally large structures and storage reservoirs. Civil assets form the greater part of the total assets and will have the largest impact on depreciation. We suggest a 100 year asset life from the date of commissioning would be appropriate;*
- ii. *The electrical and mechanical assets at the Prospect and Wyuna plants are consistent with Sydney Water's similar assets. At Macarthur, the asset lives appear to be low and, unless driven by poor asset condition, should be similar to the other plants;*
- iii. *The electronic asset lives at Prospect and Wyuna are low in comparison with similar assets although this may be driven by the duration of the lease. We would normally expect to apply an asset life of 15 years.*

Sydney Water Submission

Sydney Water explained that asset lives for the Prospect and two Wyuna filtration plants were determined using expert judgement. The life assumption was 70 years from the date of construction implying a remaining life of 50 years for the Prospect plant and 51 years for the two Wyuna filtration plants. It considered that the asset lives were derived from a more accurate assessment of the actual state of the physical assets being acquired.

The asset lives at the Macarthur filtration plant of 14 years for electrical, 19 years for mechanical and 14 years for electronic assets related to the assumption that assets should be depreciated over the remaining life of the finance lease.

Review

Sydney Water did not provide any further information to support its views. We revisited the information provided in October 2015 and our findings at that time. We confirmed that most of the civil assets are large structures and storage tanks where, from comparison with other utilities and the asset lives assumed by Sydney Water for its own assets, a 100 year asset life from the date of commissioning would be appropriate. This implies a current remaining asset life of 80 years.

We assumed that the Macarthur filtration plant is likely to continue in operation beyond the life of the current lease as this is a large plant necessary to supply water in the long term. The electrical, mechanical and electronic asset lives should reflect the continuing operational of the plant beyond the current lease. It is not necessary to write off the assets at the termination of the lease.

Findings

We found that there is no reason to change from our earlier assumptions on asset lives as applied by IPART in its Draft report.

Impact

There is no impact on assumed asset lives and depreciation.

6. Total Efficient Expenditure

6.1. Operating Expenditure

Total efficient operating expenditure is presented in Table 6-1 below. This takes into account the changes to opex efficiency and the adjustment for electricity costs discussed in Section 2.

Table 6-1 Summary of Revised Assessment of Efficient Operating Expenditure

SYDNEY WATER EFFICIENT EXPENDITURE - REVISED AFTER MAY 2016 REVIEW					
(\$k 2015/16) year ending June	2017	2018	2019	2020	Total 2017 to 2020
SERVICE					
Water	229.6	230.7	230.5	229.2	920.0
Wastewater	506.5	505.3	501.9	497.8	2011.5
Stormwater	12.2	12.6	12.8	12.8	50.5
Bulk Water	480.5	480.0	479.2	483.3	1922.9
Recycled Water	27.2	27.1	25.7	25.8	105.8
Finance Leases	0.0	0.0	0.0	0.0	0.0
Less Rosehill Scheme	-3.1	-1.7	-1.7	-1.7	-8.2
Total Regulated Services	1252.9	1254.1	1248.3	1247.2	5002.5
EXPENDITURE SUBJECT TO EFFICIENCY ADJUSTMENTS					
Total less bulk water	772.5	774.1	769.1	764.0	3079.6
REPROFILING					
Electricity	0.9	-2.6	-3.5	-4.1	-9.3
Service Delivery Reprofile	-1.0	-2.5	-2.5	-2.5	-8.5
ADJUSTED EXPENDITURE BEFORE APPLICATION OF EFFICIENCY TARGETS					
Water	229.6	229.1	228.5	227.0	914.1
Wastewater	506.4	501.9	497.8	493.4	1999.6
Stormwater	12.2	12.6	12.8	12.8	50.5
Recycled Water	27.2	27.1	25.7	25.8	105.8
Finance Leases	0.0	0.0	0.0	0.0	0.0
Less Rosehill Scheme	-3.1	-1.7	-1.7	-1.7	-8.2
Reprofiled expenditure	772.3	769.0	763.1	757.3	3061.8
EFFICIENCY ADJUSTMENTS					
Efficiency	-0.9	-2.9	-12.0	-13.3	-29.1
EFFICIENT EXPENDITURE					
Water	229.3	228.2	224.7	222.8	905.0
Wastewater	505.8	499.9	489.6	484.3	1979.7
Stormwater	12.2	12.6	12.8	12.8	50.5
Recycled Water	27.2	27.1	25.7	25.8	105.8
Rosehill Scheme	-3.1	-1.7	-1.7	-1.7	-8.2
Total Efficient Expenditure	771.4	766.1	751.1	744.0	3032.7

6.2. Prudent Expenditure

We have made no adjustment to our original findings. We confirm the value of the adjustment in Table 6-2 below.

Table 6-2 Recommended prudence adjustment in the future price path

(\$M 2015/16) year ending June	2017	2018	2019	2020	2017-20 Total
IT CMS system- residual value of asset from planned write-off because of T2020 Customer Billing System	0.0	-24.8	0.0	0.0	-24.8

6.3. Capital Expenditure

We have derived a revised recommendation for the efficient level of capital expenditure for each service based on the adjustments detailed in Section 4. As for our original assessment, continuing and catch-up efficiencies have been applied to the adjusted 'pre-efficiency' expenditure to reflect the catch-up potential in investment planning, cost estimating and contingency management and procurement.

6.3.1. Summary of amendments

As outlined in Section 4 above, this review has led to a number of changes in the recommended level of expenditure.

The evolution of the adjustments made to Sydney Water's capital program are summarised in Table 6-3 below. Overall, Sydney Water accepted \$185.3M, just under half (44%) of the reductions outlined in IPART's Draft Report and challenged \$234.5M or 56% of them. As a result of this Supplementary Review, we have accepted Sydney Water's representations on \$119.8M of the adjustments, leading to recommended reductions of \$299.9M.

The change in 'catch-up and continuing efficiency' reflects both the adjustment for the potential double-counting of efficiency in the growth program and the increase in the absolute (in \$) effect of efficiency challenge as a result of items added back into the pre-efficiency capital program.

Table 6-3 Summary of Revised Assessment of Efficient Capital Expenditure

CAPITAL EXPENDITURE ADJUSTMENTS (\$15-16M)					
Area	IPART Draft Report	SWC Accept	SWC Challenge	Change resulting from this Review	Final Capex adjustment
1. Catch-up & continuing efficiency:	-155.0	-116.1	-38.9	26.6	-128.4
2. Pre-Efficiency Adjustments:					
2a SWC Accept / Accept With Concern	-69.1	-69.1	0.0	0.0	-69.1
2b SWC Dispute...					
Wastewater Treatment renewals	-101.5	0.0	-101.5	39.5	-62.0
Avoid Fail Sewers	-34.3	0.0	-34.3	8.8	-25.5
Reticulation Water Mains	-26.1	0.0	-26.1	21.2	-4.9
North Head Biosolids	-13.3	0.0	-13.3	4.1	-9.2
North West Growth Centre	-13.4	0.0	-13.4	13.4	0.0
Metering	-7.1	0.0	-7.1	6.4	-0.7
Total Adjustments	-419.7	-185.3	-234.5	119.8	-299.9

The revisions by year are summarised below. Table 6-4 summarises the adjustments in IPART's Draft Report for comparison with the revised adjustments in Table 6-5.

Table 6-4 Summary of IPART Draft Report Capital Program Adjustments by Year

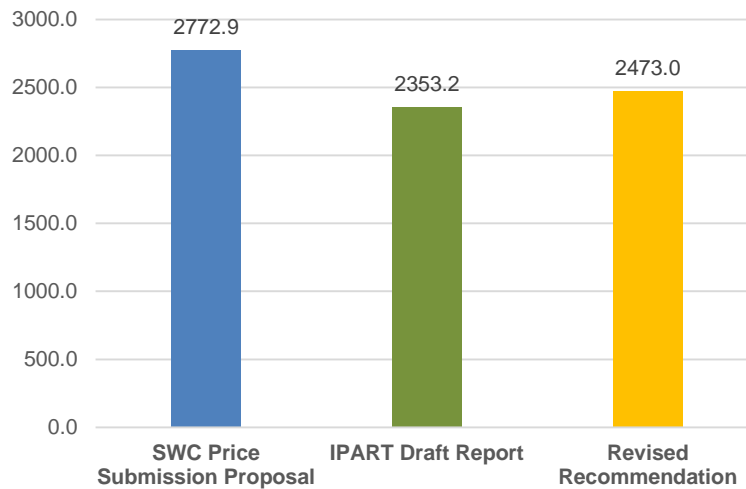
Area	\$M 2015/16	2017	2018	2019	2020	2017-20 Total
1. Catch-up & continuing efficiency:		-20.2	-37.8	-47.2	-49.9	-155.0
2. Pre-Efficiency Adjustments:						
2a SWC Accept / Accept With Concern		-15.7	-25.6	-17.1	-10.8	-69.1
2b SWC Dispute...						
Wastewater Treatment renewals		-22.6	-22.6	-26.1	-30.1	-101.5
Avoid Fail Sewers		-8.1	-6.7	-8.4	-11.0	-34.3
Reticulation Water Mains		-6.5	-6.5	-6.5	-6.5	-26.1
North Head Biosolids		0.0	-13.3	0.0	0.0	-13.3
North West Growth Centre		0.0	-18.9	-7.2	12.8	-13.4
Metering		-1.4	-1.9	-1.9	-1.9	-7.1
Total Adjustments		-74.6	-133.3	-114.5	-97.4	-419.7

Table 6-5 Summary of Revised Capital Program Adjustments by Year (15-16M)

Area	\$M 2015/16	2017	2018	2019	2020	2017-20 Total
1. Catch-up & continuing efficiency:		-10.3	-28.8	-41.8	-47.5	-128.4
2. Pre-Efficiency Adjustments:						
2a SWC Accept / Accept With Concern		-15.7	-25.6	-17.1	-10.8	-69.1
2b SWC Dispute...						
Wastewater Treatment renewals		-12.8	-12.8	-16.2	-20.2	-62.0
Avoid Fail Sewers		-16.7	-8.8	0.0	0.0	-25.5
Reticulation Water Mains		-1.2	-1.2	-1.2	-1.2	-4.9
North Head Biosolids		-3.3	-5.9	0.0	0.0	-9.2
North West Growth Centre		0.0	0.0	0.0	0.0	0.0
Metering		-0.3	-0.3	-0.1	0.0	-0.7
Total Adjustments		-60.3	-83.4	-76.4	-79.8	-299.9

As summarised below, the results of this review are to suggest an overall capital program in the future price path of \$2473.0M which is 11% lower than Sydney Water's original price submission proposal.

Figure 6-1 Summary of revised capital expenditure program recommendation in 2017-20 (\$15-16M)



Further details of the revised proposals for capital expenditure are provided below. As in the original submission, in each table we have provided an indicative asset category breakdown for the recommended expenditure. This is based on the "SIR CEMELEND" sheet provided by Sydney Water, amended based on our estimate of the asset category breakdown of the specific adjustments made and then pro-rated for the capital efficiency targets.

Water Service

We summarise our proposals for prudent and efficient capital expenditure in Table 6-6 below.

Table 6-6 Water Service: Summary of Revised Assessment of Efficient Capital Expenditure

SYDNEY WATER CORPORATION PROPOSAL - CAPEX - WATER SERVICE					
(\$M 2015/16) year ending June	2017	2018	2019	2020	2017-20 Total
Existing Mandatory Standards	131.0	124.5	124.0	124.4	503.9
New Mandatory Standards	0.0	0.0	0.0	0.0	0.0
Asset & Service Reliability	0.0	0.0	0.0	0.0	0.0
Growth	63.8	64.9	61.4	36.8	226.9
Government Programs	0.0	0.0	0.0	0.0	0.0
Discretionary	0.0	0.0	0.0	0.0	0.0
Business Efficiency	0.0	0.0	0.0	0.0	0.0
Total	194.8	189.4	185.4	161.2	730.8
Atkins/Cardno recommended adjustments for specific programs or projects					
Efficiencies already applied to growth program	3.5	3.6	3.4	2.0	12.4
"Critical Watermain Renewals"	-2.0	-2.0	-2.0	-2.0	-8.0
" Reticulation Watermain Renewals"	-1.2	-1.2	-1.2	-1.2	-4.9
" Reservoir Renewal and Reliability"	-5.8	-5.0	-4.9	-4.9	-20.5
" WPS Renewals"	-4.0	-5.7	-2.0	-1.4	-13.1
Reprofiled NWGC spend	0.0	0.0	0.0	0.0	0.0
Adjusted Meter Investment Program	-0.3	-0.3	-0.1	0.0	-0.7
ADJUSTED EXPENDITURE BEFORE APPLICATION OF EFFICIENCY TARGETS					
Existing Mandatory Standards	117.7	110.3	113.8	114.9	456.6
New Mandatory Standards	0.0	0.0	0.0	0.0	0.0
Asset & Service Reliability	0.0	0.0	0.0	0.0	0.0
Growth	67.3	68.5	64.8	38.8	239.3
Government Programs	0.0	0.0	0.0	0.0	0.0
Discretionary	0.0	0.0	0.0	0.0	0.0
Business Efficiency	0.0	0.0	0.0	0.0	0.0
Total	185.0	178.7	178.5	153.7	696.0
Atkins/Cardno recommended additional capital efficiency targets (beyond those applied by the company)					
Continuing Efficiency (%)	0.25%	0.50%	0.75%	1.00%	
Catch-up efficiency (%)	2.90%	5.80%	7.20%	8.60%	
ATKINS/CARDNO ASSESSMENT OF EFFICIENT EXPENDITURE					
(\$M 2015/16) year ending June	2017	2018	2019	2020	2017-20 Total
Existing Mandatory Standards	114.1	103.7	105.4	104.9	428.1
New Mandatory Standards	0.0	0.0	0.0	0.0	0.0
Asset & Service Reliability	0.0	0.0	0.0	0.0	0.0
Growth	65.2	64.4	60.0	35.4	225.1
Government Programs	0.0	0.0	0.0	0.0	0.0
Discretionary	0.0	0.0	0.0	0.0	0.0
Business Efficiency	0.0	0.0	0.0	0.0	0.0
Total Efficient Expenditure	179.3	168.1	165.4	140.3	653.1
ATKINS/CARDNO ASSESSMENT OF EFFICIENT EXPENDITURE- BY ASSET CATEGORY					
(\$M 2015/16) year ending June	2017	2018	2019	2020	2017-20 Total
Civil	155.3	146.5	143.1	118.8	563.7
Electrical	3.8	3.5	4.0	3.8	15.1
Mechanical	5.2	4.9	5.6	5.4	21.1
Electronic	15.0	13.2	12.8	12.2	53.2
Non-Depreciable Asset	0.0	0.0	0.0	0.0	0.0
Total Efficient Expenditure	179.3	168.1	165.4	140.3	653.1

Wastewater Service

We summarise our proposals for prudent and efficient capital expenditure in Table 6-7 below.

Table 6-7 Wastewater Service: Summary of Revised Assessment of Efficient Capital Expenditure

SYDNEY PROPOSAL - CAPEX - WASTEWATER SERVICE					
(\$M 2015/16) year ending June	2017	2018	2019	2020	2017-20 Total
Existing Mandatory Standards	193.4	195.9	246.0	254.7	890.1
New Mandatory Standards	28.3	33.9	48.2	43.1	153.4
Asset & Service Reliability					0.0
Growth	125.0	155.2	91.4	37.7	409.3
Government Programs	0.0	2.2	0.0	0.5	2.6
Discretionary	0.0	0.0	0.0	0.0	0.0
Business Efficiency	25.2	17.3	1.1	1.1	44.8
Total	371.9	404.5	386.7	337.0	1500.2
Atkins/Cardno recommended adjustments for specific programs or projects					
Efficiencies already applied to growth program	6.9	8.5	5.0	2.1	22.5
"Avoid Fail Sewer Renewals"	-16.7	-8.8	0.0	0.0	-25.5
"WWTP Renewals"	-12.8	-12.8	-16.2	-20.2	-62.0
Reprofiled NWGC spend	0.0	0.0	0.0	0.0	0.0
Energy management	-1.2	-3.8	1.4	1.4	-2.2
North Head Biosolids	-3.3	-5.9	0.0	0.0	-9.2
ADJUSTED EXPENDITURE BEFORE APPLICATION OF EFFICIENCY TARGETS					
Existing Mandatory Standards	164.0	174.3	229.8	234.5	802.5
New Mandatory Standards	28.3	33.9	48.2	43.1	153.4
Asset & Service Reliability	0.0	0.0	0.0	0.0	0.0
Growth	128.6	157.8	96.4	39.7	422.5
Government Programs	0.0	2.2	0.0	0.5	2.6
Discretionary	0.0	0.0	0.0	0.0	0.0
Business Efficiency	24.0	13.6	2.5	2.5	42.6
Total	344.8	381.7	376.9	320.2	1423.7
Atkins/Cardno recommended additional capital efficiency targets (beyond those applied by the company)					
Continuing Efficiency (%)	0.25%	0.50%	0.75%	1.00%	
Catch-up efficiency (%)	2.90%	5.80%	7.20%	8.60%	
ATKINS/CARDNO ASSESSMENT OF EFFICIENT EXPENDITURE					
(\$M 2015/16) year ending June	2017	2018	2019	2020	2017-20 Total
Existing Mandatory Standards	159.0	164.0	212.8	213.9	749.7
New Mandatory Standards	27.4	31.9	44.6	39.3	143.2
Asset & Service Reliability	0.0	0.0	0.0	0.0	0.0
Growth	124.6	148.4	89.3	36.3	398.6
Government Programs	0.0	2.0	0.0	0.4	2.4
Discretionary	0.0	0.0	0.0	0.0	0.0
Business Efficiency	23.3	12.8	2.3	2.3	40.7
Total Efficient Expenditure	334.3	359.1	349.1	292.2	1334.7
ATKINS/CARDNO ASSESSMENT OF EFFICIENT EXPENDITURE- BY ASSET CATEGORY					
(\$M 2015/16) year ending June	2017	2018	2019	2020	2017-20 Total
Civil	190.4	210.0	202.4	178.1	781.0
Electrical	34.8	40.2	43.2	38.6	156.7
Mechanical	37.7	45.9	43.6	37.4	164.5
Electronic	21.7	24.4	23.2	18.8	88.1
Non-Depreciable Asset	49.7	38.5	36.8	19.3	144.4
Total Efficient Expenditure	334.3	359.1	349.1	292.2	1334.7

Stormwater Service

We summarise our proposals for prudent and efficient capital expenditure in Table 6-8 below. These have not been amended since our original assessment.

Table 6-8 Stormwater Service: Summary of Efficient Capital Expenditure- NOT AMENDED

SYDNEY WATER CORPORATION PROPOSAL - CAPEX - STORMWATER					
(\$M 2015/16) year ending June	2017	2018	2019	2020	2017-20 Total
Existing Mandatory Standards	22.9	20.3	35.7	23.8	102.7
New Mandatory Standards	0.0	0.0	0.0	0.0	0.0
Asset & Service Reliability					0.0
Growth (funded by other)	26.4	22.1	6.6	1.5	56.7
Government Programs	0.0	0.0	0.0	0.0	0.0
Discretionary	0.0	0.0	0.0	0.0	0.0
Business Efficiency	0.0	0.0	0.0	0.0	0.0
Total	49.3	42.4	42.3	25.4	159.4
Atkins/Cardno recommended adjustments for specific programs or projects					
Minor Stormwater Renewals	0.0	-3.5	-1.2	-0.6	-5.3
Adjustment for updated Rouse Hill projections	-1.6	0.0	0.0	0.0	-1.6
Elizabeth Macarthur reprofiling	-1.2	-5.6	-2.9	2.2	-7.5
ADJUSTED EXPENDITURE BEFORE APPLICATION OF EFFICIENCY TARGETS					
Existing Mandatory Standards	22.9	16.8	34.5	23.3	97.5
New Mandatory Standards	0.0	0.0	0.0	0.0	0.0
Asset & Service Reliability	0.0	0.0	0.0	0.0	0.0
Growth	23.6	16.6	3.7	3.7	47.7
Government Programs	0.0	0.0	0.0	0.0	0.0
Discretionary	0.0	0.0	0.0	0.0	0.0
Business Efficiency	0.0	0.0	0.0	0.0	0.0
Total	46.5	33.3	38.3	27.0	145.1
Atkins/Cardno recommended additional capital efficiency targets (beyond those applied by the company)					
Continuing Efficiency (%)	0.25%	0.50%	0.75%	1.00%	
Catch-up efficiency (%)	2.90%	5.80%	7.20%	8.60%	
ATKINS/CARDNO ASSESSMENT OF EFFICIENT EXPENDITURE					
(\$M 2015/16) year ending June	2017	2018	2019	2020	2017-20 Total
Existing Mandatory Standards	22.2	15.8	32.0	21.2	91.2
New Mandatory Standards	0.0	0.0	0.0	0.0	0.0
Asset & Service Reliability	0.0	0.0	0.0	0.0	0.0
Growth	22.9	15.6	3.5	3.4	45.4
Government Programs	0.0	0.0	0.0	0.0	0.0
Discretionary	0.0	0.0	0.0	0.0	0.0
Business Efficiency	0.0	0.0	0.0	0.0	0.0
Total Efficient Expenditure	45.1	31.4	35.4	24.6	136.6
ATKINS/CARDNO ASSESSMENT OF EFFICIENT EXPENDITURE- BY ASSET CATEGORY					
(\$M 2015/16) year ending June	2017	2018	2019	2020	2017-20 Total
Civil	45.1	31.4	35.4	24.6	136.6
Electrical	0.0	0.0	0.0	0.0	0.0
Mechanical	0.0	0.0	0.0	0.0	0.0
Electronic	0.0	0.0	0.0	0.0	0.0
Non-Depreciable Asset	0.0	0.0	0.0	0.0	0.0
Total Efficient Expenditure	45.1	31.4	35.4	24.6	136.6

Corporate Service

We summarise our proposals for prudent and efficient capital expenditure in Table 6-9 below. These have not been amended since our original assessment.

Table 6-9 Corporate Service: Summary of Efficient Capital Expenditure- NOT AMENDED

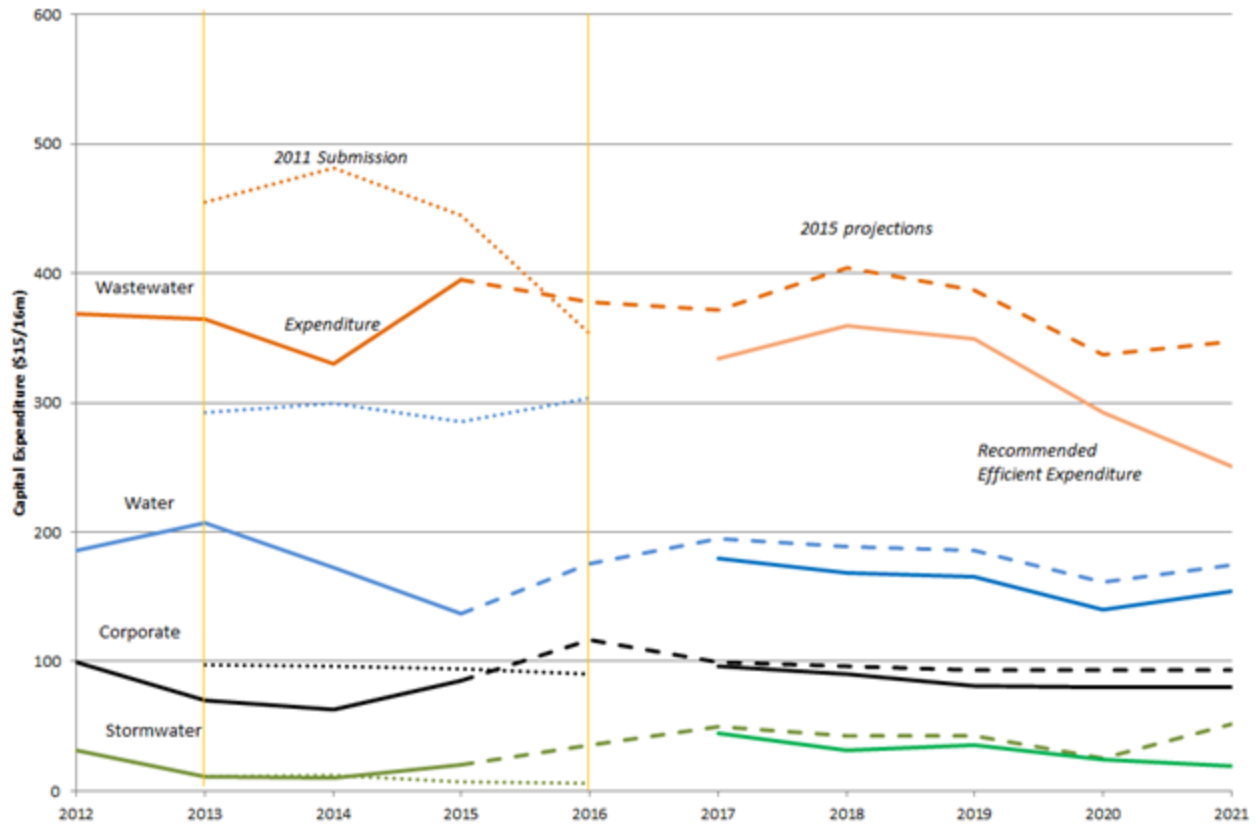
SYDNEY WATER CORPORATION PROPOSAL - CAPEX - CORPORATE					
(\$M 2015/16) year ending June	2017	2018	2019	2020	2017-20 Total
Existing Mandatory Standards	70.3	69.4	66.7	67.1	273.5
New Mandatory Standards	1.1	1.2	1.3	1.1	4.7
Asset & Service Reliability					0.0
Growth	0.0	0.0	0.0	0.0	0.0
Government Programs	0.0	0.0	0.0	0.0	0.0
Discretionary	0.0	0.0	0.0	0.0	0.0
Business Efficiency	27.9	25.6	25.6	25.3	104.4
Total	99.3	96.2	93.6	93.5	382.6
Atkins/Cardno recommended adjustments for specific programs or projects					
Field Management			-1.5	-1.5	-3.0
Specific adjustment for ERP Stage 2	0.0	0.0	-4.0	-4.0	-8.0
ADJUSTED EXPENDITURE BEFORE APPLICATION OF EFFICIENCY TARGETS					
Existing Mandatory Standards	70.3	69.4	64.0	64.4	268.0
New Mandatory Standards	1.1	1.2	1.3	1.1	4.7
Asset & Service Reliability	0.0	0.0	0.0	0.0	0.0
Growth	0.0	0.0	0.0	0.0	0.0
Government Programs	0.0	0.0	0.0	0.0	0.0
Discretionary	0.0	0.0	0.0	0.0	0.0
Business Efficiency	27.9	25.6	22.9	22.5	98.9
Total	99.3	96.2	88.1	88.0	371.6
Atkins/Cardno recommended additional capital efficiency targets (beyond those applied by the company)					
Continuing Efficiency (%)	0.25%	0.50%	0.75%	1.00%	
Catch-up efficiency (%)	2.90%	5.80%	7.20%	8.60%	
ATKINS/CARDNO ASSESSMENT OF EFFICIENT EXPENDITURE					
(\$M 2015/16) year ending June	2017	2018	2019	2020	2017-20 Total
Existing Mandatory Standards	68.1	65.3	59.3	58.7	251.4
New Mandatory Standards	1.1	1.2	1.2	1.0	4.4
Asset & Service Reliability	0.0	0.0	0.0	0.0	0.0
Growth	0.0	0.0	0.0	0.0	0.0
Government Programs	0.0	0.0	0.0	0.0	0.0
Discretionary	0.0	0.0	0.0	0.0	0.0
Business Efficiency	27.0	24.1	21.2	20.6	92.9
Total Efficient Expenditure	96.2	90.5	81.6	80.3	348.6
ATKINS/CARDNO ASSESSMENT OF EFFICIENT EXPENDITURE - BY ASSET CATEGORY					
(\$M 2015/16) year ending June	2017	2018	2019	2020	2017-20 Total
Civil	10.5	9.3	6.7	6.6	33.2
Electrical	0.0	0.0	0.0	0.0	0.0
Mechanical	3.0	2.9	2.8	3.2	11.9
Electronic	79.6	77.3	71.1	69.8	297.8
Non-Depreciable Asset	3.2	0.9	0.9	0.6	5.7
Total Efficient Expenditure	96.2	90.5	81.6	80.3	348.6

The overall company level of prudent and efficient capital expenditure is summarised in Table 6-10 below.

Table 6-10 Summary of Prudent Efficient Capital Expenditure

SYDNEY WATER CORPORATION PROPOSAL - CAPEX - COMPANY LEVEL					
(\$M 2015/16) year ending June	2017	2018	2019	2020	2017-20 Total
Water	194.8	189.4	185.4	161.2	730.8
Wastewater	371.9	404.5	386.7	337.0	1500.2
Stormwater	49.3	42.4	42.3	25.4	159.4
Corporate	99.3	96.2	93.6	93.5	382.6
Total	715.3	732.5	708.0	617.1	2772.9
Atkins/Cardno recommended adjustments for specific programs or projects					
"Critical Watermain Renewals"	-2.0	-2.0	-2.0	-2.0	-8.0
" Reticulation Watermain Renewals"	-1.2	-1.2	-1.2	-1.2	-4.9
" Reservoir Renewal and Reliability"	-5.8	-5.0	-4.9	-4.9	-20.5
" WPS Renewals"	-4.0	-5.7	-2.0	-1.4	-13.1
Reprofiled NWGC spend	0.0	0.0	0.0	0.0	0.0
Adjusted Meter Investment Program	-0.3	-0.3	-0.1	0.0	-0.7
Water-Efficiencies already applied to growth program	3.5	3.6	3.4	2.0	12.4
"Avoid Fail Sewer Renewals"	-16.7	-8.8	0.0	0.0	-25.5
"WWTP Renewals"	-12.8	-12.8	-16.2	-20.2	-62.0
Reprofiled NWGC spend	0.0	0.0	0.0	0.0	0.0
Energy management	-1.2	-3.8	1.4	1.4	-2.2
North Head Biosolids	-3.3	-5.9	0.0	0.0	-9.2
Wastewater-Efficiencies already applied to growth program	6.9	8.5	5.0	2.1	22.5
Minor Stormwater Renewals	0.0	-3.5	-1.2	-0.6	-5.3
Adjustment for updated Rouse Hill projections	-1.6	0.0	0.0	0.0	-1.6
Elizabeth Macarthur reprofiling	-1.2	-5.6	-2.9	2.2	-7.5
Field Management	0.0	0.0	-1.5	-1.5	-3.0
Specific adjustment for ERP Stage 2	0.0	0.0	-4.0	-4.0	-8.0
Total	-39.7	-42.5	-26.2	-28.2	-136.6
ADJUSTED EXPENDITURE BEFORE APPLICATION OF EFFICIENCY TARGETS					
Water	185.0	178.7	178.5	153.7	696.0
Wastewater	344.8	381.7	376.9	320.2	1423.7
Stormwater	46.5	33.3	38.3	27.0	145.1
Corporate	99.3	96.2	88.1	88.0	371.6
Total	675.6	690.0	681.8	588.9	2636.3
Atkins/Cardno recommended additional capital efficiency targets (beyond those applied by the company)					
Continuing Efficiency (%)	0.25%	0.50%	0.75%	1.00%	
Catch-up efficiency (%)	2.90%	5.80%	7.20%	8.60%	
ATKINS/CARDNO ASSESSMENT OF EFFICIENT EXPENDITURE					
(\$M 2015/16) year ending June	2017	2018	2019	2020	2017-20 Total
Water	179.3	168.1	165.4	140.3	653.1
Wastewater	334.3	359.1	349.1	292.2	1334.7
Stormwater	45.1	31.4	35.4	24.6	136.6
Corporate	96.2	90.5	81.6	80.3	348.6
Total Efficient Expenditure	655.0	649.1	631.5	537.4	2473.0
ATKINS/CARDNO ASSESSMENT OF EFFICIENT EXPENDITURE: BY ASSET CATEGORY					
(\$M 2015/16) year ending June	2017	2018	2019	2020	2017-20 Total
Civil	401.4	397.2	387.6	328.2	1514.4
Electrical	38.6	43.7	47.1	42.4	171.9
Mechanical	45.9	53.7	52.0	46.0	197.5
Electronic	116.3	114.9	107.1	100.8	439.1
Non-Depreciable Asset	52.9	39.5	37.8	19.9	150.1
Total Efficient Expenditure	655.0	649.1	631.5	537.4	2473.0

Figure 6-2 Assessment of Efficient Capex versus the Proposed Level by Product



Appendices



Appendix A. Terms of Reference

SCOPE OF WORK

PROJECT NAME: Sydney Water Corporation - Expenditure Review – Extension

1. BACKGROUND

IPART is seeking to extend Atkins Cardno's engagement for the review of Sydney Water's expenditure for the 2016 Determination period.

Task: Review Sydney Water's submission to IPART's draft report, including a further review of material presented by Sydney Water to support its proposed operating and capital expenditure.

2016 Price Review

IPART is conducting a review of Sydney Water's maximum charges for its water, sewerage, stormwater drainage and other services, to apply from 1 July 2016. The maximum charges determined by IPART for the upcoming determination period will cover a period of up to five years from 1 July 2016 (the duration of which will be determined by IPART during the course of the review).

In setting prices, we are required to consider the matters set out in section 15 of the *Independent Pricing and Regulatory Tribunal Act 1992*, which include the standards for quality, reliability, and safety.

In December 2015, Atkins Cardno delivered its final report to IPART on its review of Sydney Water's operating and capital expenditure. Recommendations included reducing Sydney Water's proposed capital expenditure by \$420 million, operating expenditure by \$81 million and removing \$25 million from the regulatory asset based (RAB) for redundant IT assets.

In March 2016, IPART released its draft report and draft determination. In setting price for the draft report, IPART accepted all of Atkins Cardno's recommendations.

IPART's Draft Report and Draft Determination are available at:
http://www.ipart.nsw.gov.au/Home/Industries/Water/Reviews/Metro_Pricing/Review_of_prices_for_Sydney_Water_Corporation_from_1_July_2016

2. OBJECTIVES

The objectives of this consultancy are:

A review of Sydney Water's submission to IPART's Draft Report, with respect to Sydney Water's response to IPART's draft decisions on operating and capital expenditure.

3. DESCRIPTION OF SERVICES

IPART requires the consultant to provide the following services:

Task 1: Review of Sydney Water's response to IPART's draft decisions on expenditure

Atkins Cardno must undertake a review of Sydney Water's submission to IPART's draft report and draft determination, with respect to its response to IPART's draft decisions on capital and operating expenditure.

Atkins Cardno is required to review Sydney Water's arguments and any further evidence on both capital and operating expenditure. This may include: the appropriateness of the continuing and catch-up efficiency factors used to derive efficient operating expenditure reductions to Sydney Water's proposed expenditure on electricity evidence and arguments used to contest our adjustments to specific Sydney Water capital projects and programs the appropriateness of the continuing and catch-up efficiency factors used to derive efficient capital expenditure, and any trade-offs between capital expenditure and operating expenditure.

Atkins Cardno must provide advice on:

- a) The level of efficient operating expenditure it recommends for Sydney Water between 2016-17 and 2019-20 for IPART's final report and determination
- b) The level of efficient capital expenditure it recommends for Sydney Water between 2016-17 and 2019-20 for IPART's final report and determination
- c) Any other adjustments deemed appropriate, as necessary.

4. REQUIRED OUTPUT

The primary output items from the project are set out below.

4.1 Reports

Final Report on the review of Sydney Water's submission

The consultant will be required to produce a Final Report, which addresses Task 1 above. The report must include:

A clear explanation of the consultant's reasons or rationale for each of these recommendations, including its information sources, approach and any key assumptions used report values in \$2015-16.

Furthermore:

all tables and calculations in the reports must also be provided in Excel format to facilitate the transfer of the consultant's outputs to IPART's pricing models (to avoid rounding errors introduced through text-only formats), and

The consultant must conduct a thorough Quality Assurance check of all outputs to eliminate errors and inconsistencies.

The Final Report should be clearly and logically set out and written in plain English, avoiding the unnecessary use of technical terms. The report should incorporate appendices for supporting information and evidence where necessary.

The consultant should note that the Final Report may be released as a public document and made available on the IPART website. Sydney Water may identify expenditure projects or other detail that is commercial-in-confidence. The consultant must provide a version of the Final Report suitable for publication without commercial-in-confidence information, subject to IPART's instructions as to whether it agrees that the identified information is commercial-in-confidence. Therefore, the consultant must provide two versions of the Final Report:

One confidential version

One public version suitable for publication without confidential information.

The Final Report must be provided in PDF format suitable for web publication (i.e., on IPART's website for stakeholder comment).

4.2 Presentation

Presentation to Tribunal

The consultant must prepare and deliver a presentation to the Tribunal which covers:

Key findings

Reasons for findings

5. SOURCES OF INFORMATION

The list of documents below is provided as a guide only, it should not be considered exhaustive.

Task 1: Review of Sydney Water's submission to IPART's Draft Report

Sydney Water's submission will set out its arguments and reasons for its proposed changes to IPART's draft decisions on operating and capital expenditure.

Sydney Water may also collate and produce further documents and evidence which support its submission, but are not in the public domain.

In addition to its own analysis of available information provided, the consultant is required to source and report analysis of other inputs through:

Interviews with Sydney Water staff

Comparisons with relevant organisations, and

The consultant's experience in water and wastewater businesses and in undertaking other similar tasks.

In the event that the consultant identifies gaps in the information, it is the responsibility of the consultant to take the necessary steps to acquire the required information and to liaise promptly with IPART to ensure that the consultancy outputs are delivered on time. Should the reliability of the information be in doubt, the consultant is expected to source 'second best information', apply sound judgement and provide detail and justification for assumptions made.

6. LIAISON/CONSULTATION

The consultant may be required to attend and participate in meetings, have involvement in consultation, and attend and present at workshops or Tribunal meetings as circumstances dictate.

7. TIMETABLE

The consultant must meet the following work schedule:

Date	Activity
15 April 2016	Inception meeting with IPART
18 April 2016	Commence review of submission
4 May 2016	Presentation of findings to Tribunal
6 May 2016	Provide final report

Appendix B. Response to representations on the IPART Draft Report related to Sydney Water's IT proposal

IPART received representations seeking clarification on a number of points. Broadly, these clarifications relate to the optioneering process to determine Sydney Water Corporation's IT programme and the costs involved in its ERP implementation, which includes replacement of its billing and customer relationship management systems. Many of the issues raised reflect areas which we have reviewed and the Corporation was either able to satisfy us that its plans are prudent and efficient, or where we were not satisfied, or the evidence was available, we have identified any risks and concerns to IPART.

Overall, we identified that Sydney Water has made significant progress in the level of maturity of its IT business planning, and its ability to delivery transformative projects like a SAP ERP since our review in 2011. When comparisons are made with other water utilities in Australia, it is expected that Sydney Water would be an outlier where there is a necessary and justified peak in expenditure, as is the case for the implementation of SAP. Our benchmarking with other Australian utilities suggest opex is under the average and that capex is higher than the average, which we also observed in 2011.

Sydney Water Corporation has undertaken extensive planning and investigation with some of the world's leading IT consultancies as well as acquiring skills in house in order to identify and assess the options and their relative costs. Ultimately, the selection of a 'Best of Breed' versus an ERP solution is a function of the business strategy and resilience as enabled by the IT strategy and the procurement process that supports this decision.

The business case for the replacement of the billing system is primarily driven by the risks of an IT failure, while the business case for the wider ERP implementation is driven by efficiencies and enablers to the whole business. We have identified this in our report³ where there is a risk that existing assets are being decommissioned and replaced before the end of their asset life, and recommended adjustments are made. This relates to the CMS in the next price path, potentially Maximo in the subsequent price path.

There is no one single factor that determines which system is better than the other, rather the system that is implemented must be the one that most effectively and efficiently supports the business strategy. In the UK, SAP is used extensively in the water industry. Of the eight water utilities where it is used, Anglian Water, Southern Water and Thames Water have or are implementing the SAP CRM and Billing components while the other companies integrate with different solutions. In Australia, Sydney Water Corporation will be the first water utility to implement a SAP solution but it is used extensively by other companies.

Overall, the work done on the billing and customer relationship management components has been extensive; this is reflected in the robust cost build-up. Our review of the costs associated with the wider ERP implementation identified that the certainty of estimates relates to the stages of development of this project; that is, some costs towards the end of the price path are less certain. One of the benefits of the IPART regulatory process is that the prudence and efficiency of investments are assessed both before investment and also at the next Price Determination. There is therefore a strong incentive on Sydney Water to manage the implementation successfully and demonstrate its prudence and efficiency at the next price review.

We are not aware of any program to use digital or smart meters by Sydney Water.

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