

# Review of capital and operating expenditure plans of SA Water - 2013/14 to 2015/16 price determination

Final Report



Prepared for Essential  
Services Commission of South  
Australia  
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# Executive Summary

## Introduction

Following a series of reforms, the Essential Services Commission of South Australia (ESCoSA) has been appointed as the independent economic regulator for the water industry in South Australia. It is currently undertaking a review of SA Water's revenues from water and wastewater services for the period 1 July 2013 to 30 June 2016. Cardno in association with Atkins have been appointed by ESCoSA to determine the prudent and efficient level of capital expenditure and operating expenditure required by SA Water over this review period. The recommendations of this report will inform the conclusions of ESCoSA. The scope for this review includes the following elements set by ESCoSA:

### Capital expenditure

- ▶ A review of SA Water's planning and asset management capability.
- ▶ A view of planned capital expenditure on a 'whole of system' basis, taking account of a long-term planning horizon.
- ▶ An engineering judgement as to the requirement for the proposed projects/programs.
- ▶ A view on the timing and deliverability of the proposed projects/programs.
- ▶ A view on the options considered in developing the projects/programs, including identification of any further options that should be considered.
- ▶ A comparison of costs/unit costs of the planned project/programs versus similar projects in other jurisdictions.
- ▶ Where a project deferral is recommended, a re-phasing of expenditure should be provided.
- ▶ An appropriately supported view on the reasonableness of SA Water's assumptions on cost escalation/efficiency on capital costs across the price determination period (e.g. wages growth, productivity assumptions, materials costs).
- ▶ Any further relevant considerations.

### Review of operating expenditure

ESCoSA requires advice on SA Water's operating expenditure plans, including the following:

- ▶ A review of the efficiency of SA Water's proposed operating expenditure, including both directly attributed costs and allocated costs for regulated services and excluded services.
- ▶ Identification and analysis of SA Water's potential for cost reductions/efficiency gains.
- ▶ Identification and analysis of any areas of operations where planned expenditure is considered inadequate.
- ▶ A view on the reasonableness of SA Water's attribution of costs between regulated, excluded and unregulated services, identifying any adjustments as necessary.
- ▶ A review of the operating, maintenance, and administrative costs related to Adelaide Desalination Plant.
- ▶ An appropriately supported view on the reasonableness of SA Water's assumptions on cost escalation/efficiency on operating costs across the price determination period (e.g. wages growth, productivity assumptions, materials costs).
- ▶ Any further relevant considerations.

## SA Water

SA Water is wholly owned by the Government of South Australia, established by the *South Australian Water Corporation Act 1994*. SA Water provides water and wastewater services to approximately 1.5 million customers via over 700,000 connection points across both metropolitan Adelaide and country South Australia. SA Water<sup>1</sup> owns assets with a replacement cost of more than \$13 billion, including:

- ▶ More than 26,500km of water mains.
- ▶ Approximately 8,700km of sewer mains.
- ▶ 30 water treatment plants.
- ▶ 23 wastewater treatment plants.

SA Water's operations are primarily governed by the *South Australian Water Corporation Act 1994* and the *Public Corporations Act 1993*. The *Water Industry Act 2012* came into force on 1 July 2012, replacing a number of other pieces of legislation that previously provided SA Water with its powers to operate and maintain its infrastructure and charge for these services.

SA Water, like all water utilities, faces challenges in delivering its service efficiently and effectively, due to the particular circumstances of its operating environment. The table below details the challenges and opportunities that SA Water has identified and detailed in its Strategic Plan 2012 – 2016.

### SA Water's challenges and opportunities<sup>2</sup>

Challenges / Opportunities	Descriptions
Safety	SA Water currently has a reasonable record in regard to safety, due to targeted organisational safety programs. However, this record needs to be improved, never compromised and driven by all employees and contractors.
Demand and pricing	Water restrictions and changes in water use patterns have seen a significant fall in water consumption over the past decade, which has negatively affected revenue generation. With significant investment in water security infrastructure in recent years, water prices have also risen sharply. Further research will enable SA Water to understand better the balance between prices and service standards expected by customers.
Asset reliability	SA Water has an extensive portfolio of physical and natural assets, which includes a mix of ageing assets and brand new, high-cost capital investments. Appropriate lifecycle planning, management and maintenance will ensure continuity in supply and quality while maintaining the best value for customers.
Changing demographics	The South Australian population, as well as SA Water's customer demographics, are changing. The population is both increasing and ageing, while also consolidating onto smaller land holdings. SA Water needs to gain a greater appreciation of what this means for domestic water use and the customer's ability to pay.
Regulatory environment	The introduction of independent economic regulation from 1 July 2013 reinforces the objective to be prudent and efficient. SA Water must also ensure that all existing regulatory requirements (in terms of the environment, health and water) are maintained.
Competition	It is likely that over time SA Water will face pressure from new industry participants. This may come either in the form of third party access to SA Water's infrastructure or the provision of water services to smaller groups of customers from independent sources like small desalination plants.
Changing workforce	SA Water's workforce includes many employees reaching retirement age. We are also experiencing competition from rapidly expanding industries (like mining) for certain key skills. SA Water needs to remain competitive as an employer of choice in order to maintain business operations effectively.

<sup>1</sup> Web sourced from SA Water homepage (<http://www.sawater.com.au/SAWater/AboutUs/AboutSAWater/Proudly+South+Australian.htm>) as of 27 September 2012.

<sup>2</sup> Sourced from SA Water Strategic Plan 2012-2016

Challenges / Opportunities	Descriptions
Innovation	The source of many of SA Water's past successes has been innovation. While innovation is a means, rather than an end in itself, SA Water will always be looking for ways to improve in all areas. Innovation will be the key to responding proactively to many of the challenges and opportunities identified within the Strategic Plan.
Changing climate	The climate is changing. Over time, temperatures are expected to increase and rainfall reduce (although rainfall will most likely be more intense when it does occur). Also, due to market factors, energy prices will rise. SA Water must be prepared for climate change, in terms of water security (which may also be affected by the future Murray-Darling Basin Plan) and exposure to the energy market while managing the associated impacts on customers.
Network capability	Projections show a significant increase in Adelaide's population over the next 30 years. Many outer urban areas will expand and there will also be a greater focus on infill housing in the metropolitan area. SA Water needs to ensure that networks can cater for this growth.
Water quality	South Australia has always faced water quality challenges due to poor quality source water. In order to reduce risks to customers, SA Water needs to continue to enhance detection and treatment processes in accordance with legal frameworks.

Throughout our review, we have considered these challenges and opportunities to the extent that they impact on SA Water's expenditure. We believe that a well-run and efficient business will always look to mitigate the impact of changed circumstances and new challenges so that full costs are not passed on to customers. Equally, a well-run and efficient business should recognise opportunities for efficiencies through, for example, improved work practices and adopting new technologies.

## Methodology

The Cardno-Atkins methodology for determining the efficient level of capital and operating expenditure required by SA Water is based on the hypothesis of an efficient 'frontier' organisation competing in an open market to deliver services to customers. Under this framework, efficiency gains made by the frontier company are referred to as continuing efficiency, with catch-up applied to companies that are behind the frontier company on the assumption that they have greater scope to make improvements. We have compared the business processes and systems and outcomes of SA Water against this standard of the frontier business and assessed the level of catch-up and continuing efficiency gains that may be achieved by the organisation.

Before applying efficiency gains, we have adjusted SA Water's expenditure proposals in the following areas:

- ▶ Rebasing of SA Water's expenditure profiles where required to achieve a common price base.
- ▶ Removal of items of expenditure that are determined to be unjustified in the regulatory period.
- ▶ Adjustment to the timing of items of expenditure where there is sufficient evidence that the timing proposed by SA Water is unrealistic.
- ▶ Adjustment of any top down factors applied to expenditure categories where we believe that the factors applied by SA Water are unreasonable (for example cost contingencies and real escalation factors).

Following these adjustments, continuing and catch-up efficiency factors are applied to arrive at our determined level of prudent and efficient operating and capital expenditure.

## Benchmarking

To inform our opinion of SA Water's performance and efficiency, we have benchmarked the organisation against other water utilities drawing on the comparative information published by the National Water Commission in its National Performance Reports for Urban Water Utilities.

We recognise the limitations of benchmarking resulting from the varied circumstances of each utility, particularly the scope of their operations and their varying size and hence their differing ability to achieve economies of scale. Therefore, we have only made high level observations on the basis of this data. The metrics presented and the observations drawn from each are summarised in the table below. The benchmark graphs are included in Section 2.5.

#### Observations from benchmarking of SA Water against other major utilities

Benchmark metric	Observation
Population receiving water supply	SA Water is amongst a group of five water utilities across Australia (Water Corporation-Perth, Queensland Urban Utilities, Yarra Valley Water and South East Water) that serve between 1-2 million customers.
Water main breaks per 100km of water mains	For its Adelaide operations, SA Water has fewer than 20 water main breaks per 100km of mains. This is amongst the lower main break rates in the sample and suggests that SA Water's water mains are performing well
Sewerage main breaks and chokes per 100km of main	For its Adelaide operations, SA Water reports around 50 sewer main breaks and chokes per 100km of mains. This is amongst the highest break/choke rates in the sample and suggests that performance of SA Water's sewer mains may be improved.
Water losses	SA Water's rate of real losses is around the mid-range for the sample.
Water operating costs per property	SA Water has amongst the lowest operating costs for the water service amongst major utilities.
Sewerage operating costs per property	SA Water has the lowest operating costs for the sewerage service amongst major utilities, a position it has consistently held. Taken with the above result for water operating costs, SA Water has the lowest operating cost per property amongst the major utilities.
Average annual residential water supplied per property in 2010/11	In 2010/11, SA Water (Adelaide only) was amongst four utilities providing more than 150kL per annum per property. The other five utilities in the sample all supplied less than 150kL per property in the year.
Sewage collected per property in 2010/11	SA Water's Adelaide operations have the lowest volume of sewage collected per property amongst the major utilities. This is likely due to a combination of SA Water's sewers being in comparatively good condition compared with other major utilities and the relatively dry climate both of which lead to decreased inflow and infiltration in the network.
Percentage growth in total connected properties – sewerage	Growth in properties connected for sewerage has been amongst the lowest in the sample, lying between 1-1.5% from 2005/06 to 2010/11.
Percentage growth in total connected properties – water supply	Growth in properties connected for water has been amongst the lowest in the sample, lying between 1-1.5% from 2005/06 to 2010/11 although showing an increasing trend. This observation and that above for sewerage properties growth suggests that SA Water has not had to accommodate high growth in its operating area over the last 5 years. However, there will inevitably be localised growth 'hot spots' which have grown rapidly in this time.
Water quality complaints	SA Water has amongst the lowest levels of water quality complaints recorded for major utilities.
Sewerage capital expenditure per property	Capital expenditure per property on the sewerage service has increased in recent years from a low base. SA Water's recent level of capital expenditure on the sewerage service is now mid-range for major utilities
Water capital expenditure per property	Capital expenditure per property for the water service is dominated by the construction of the Adelaide desalination plant.

## Governance, budgeting and cost allocation

Our understanding is that SA Water's annual budgeting cycle reflects a well-established budget on budget approach with a formal quarterly review monitoring progress. There appears to be a mature set of thresholds for approvals for both capital and operating expenditure. Indeed, for a company the size of SA Water, these

thresholds may be viewed as relatively low implying a significant degree of state control on projects and procurement. We comment on this further in the context of capital expenditure in Section 6.4.

It is our experience that a budget based bottom-up approach to planning will have a tendency to over-state future requirements in that, often, the assumption made is that the current year, or in this case the base year, has little or no headroom to accommodate additional costs. In addition we have not observed in our discussions with SA Water a risk based analysis to forecasting future operating expenditure requirements. Where there are clear reductions in operating expenditure arising from changing obligations, for example in relation to the cessation of drought expenditure, or changing operational requirements arising from the ADP and associated projects, then we recognise that the Company has reflected these in its forecasts.

SA Water has commissioned KPMG to undertake a review of its cost allocation methodology. From what we observed in our review, and based on the assurance provided in the KPMG report, we do not believe there are significant issues associated with the way in which costs are allocated between the direct control, excluded and non-regulated service areas

## Service demand

SA Water does not currently have formal service standards to meet. However, as part of the introduction of economic regulation, service standards are being introduced in a staged manner. For an initial time (1 January 2013 to 30 June 2013) prior to the first regulatory period, ESCoSA requires SA Water to use its 'best endeavours' to maintain service standards in line with its historical performance. These historical performance levels are set out in Section 4.1.

We have benchmarked a number of SA Water's important service standards against the standards (or performance) of three Victorian water businesses. For only one of the service standards compared (response time to sewage overflows within a dwelling) does SA Water have a stricter performance target (or achieved performance) than the comparator agencies. This suggests that the level of service provided by SA Water is in general lower than that in Victorian water businesses. The Victorian water businesses have been subjected to regulatory oversight for a longer period of time than SA Water.

Given that SA Water is likely to have to maintain its current service standards in the first regulatory period, and that these service standards are somewhat lower than that in comparison water utilities, we believe that there is little justification for expenditure over that already being incurred to meet these service standards. SA Water confirmed that it has not proposed additional expenditure driven by service standards.

We believe that the demand planning undertaken by SA Water is satisfactory for its purposes. We note that following the adjustments recommended by us, less than 10% of capital expenditure has a primary driver of growth.

## Strategic asset management

SA Water has the systems and people in place to carry out asset management in line with industry best practice. However, we believe that the maturity of the asset management function is such that it cannot yet be inferred that fully effective asset management is taking place. Much data is still to be gathered. The availability of the broader dataset will allow greater focus in expenditure allocation. We do not believe that SA Water can justify significant increases in asset management and particular asset maintenance expenditure at this time. However, we do accept that there needs to be an increase in the effort, and therefore cost, of gathering information from which future asset management decisions can be based.

## Capital planning processes

We found that while SA Water has well developed processes for capital development and delivery, and particularly for governance of capital expenditure, opportunity exists to improve the rigour with which SA

Water identifies and tests needs early in the capital planning process. This may be addressed in part by improving the coverage of data held in Maximo. We also believe that there are opportunities to improve SA Water's cost estimating processes and to make capital prioritisation/screening part of business as usual practices.

We believe that the following opportunities exist for SA Water to gain efficiencies in its capital planning processes:

- ▶ The taking back of the asset management functions for metropolitan assets which will allow SA Water to better understand its assets and their needs for renewal and replacement. We recognise that this process has commenced with the advent of the new Metro Adelaide Service Delivery Contract from 1 July 2011.
- ▶ Improving the depth of asset information held in Maximo, to allow SA Water to undertake more quickly, and more fully, appraisal of needs identified for further investigation.
- ▶ More rigorous treatment of cost contingencies including setting out specific guidelines for their incorporation in cost estimates, monitoring them at a program level, and moving to a risk based approach to estimating contingencies.
- ▶ Adopting a higher level, portfolio approach to managing and delivering the capital works program. This may identify opportunities to achieve the outcomes desired from the capital works program at a lower cost. We appreciate that SA Water is already moving in this direction.

We believe that the capital authorisation framework SA Water operates under is likely to generate inefficiencies. We recognise that changing this framework is largely out of SA Water's control. However, we believe that the following changes to this capital authorisation framework would lead to more efficient operation for SA Water:

- ▶ Complete confidentiality of capital cost estimates when referred to the State Government for approval.
- ▶ Referral for Full Financial Approval (FFA) after detailed design. This will remove any potential for estimates at concept design to be overestimated to allow for risks yet to be identified.
- ▶ Transferring more responsibility for capital expenditure approval from the State Government to the SA Water executive and Board through a streamlined process and higher levels of delegation.

## Recommended prudent and efficient operating expenditure

Our recommended level of prudent and efficient capital expenditure for SA Water for the regulatory period has been developed in line with our methodology as follows:

- ▶ **Adjustment of the timing of items of expenditure where there is sufficient evidence that the timing proposed by SA Water is unrealistic.**

In our review of capital expenditure we are recommending that the Aldinga WWTP project be deferred. Thus, we have made a downward adjustment to the operating expenditure associated with this scheme of some \$0.4m per annum.

- ▶ **Adjustment of any top down factors applied to expenditure categories where we believe that the factors applied by SA Water is unreasonable.**

We recommend that the cost escalator assumptions related to labour, materials and contracted services be deleted. We do not take issue with the conclusions of the Evans and Peck Report related to operating cost escalators but, in our view, and based upon the experience we have seen elsewhere in the UK and for example, the regulatory framework in NSW, as administered by IPART, such escalators adjusted for CPI are viewed as wholly business risk issues. We think that real cost

pressures related to labour, materials and contracted services will reflect the effective and prudent management by SA Water of its approach to procurement.

We are not recommending a specific adjustment to the electricity cost assumptions. We note that procurement of electricity for the Plan Period from June 2013 is at the early stages of approval. There will be uncertainty in relation to future electricity cost escalators given the volatility of the energy market. We have noted that the Company actively seeks to manage its electricity costs both operationally and in relation to tariffs. For the Adelaide Desalination Plant project it has entered into a 20 year agreement with a supplier that provides for a level of certainty that is unusual in an industry in which electricity makes up a significant proportion of the cost base.

► **Efficiency**

As set out in Section 7.3, we propose continuing efficiency factors of 1%, 2% and 2% over the three year regulatory period.

The following table details our recommended prudent and efficient operating expenditure following the application of the adjustments and efficiency factors outlined above.

**Recommended prudent and efficient operating expenditure**

\$M March 2012	2013/14	2014/15	2015/16
<b>Proposed operating expenditure</b>	483.5	469.4	465.8
<b>Expenditure adjustment</b>			
SA Water advice	-2.7	-1.5	-0.7
Deferral of Aldinga WWTP	-0.4	-0.4	-0.4
Cost escalator adjustment	-4.1	-6.5	-9.4
Total - Adjusted proposed operating expenditure	476.3	461.0	455.3
<b>Efficiency adjustment</b>			
Continuing efficiency	1.00%	2.00%	2.00%
Total cumulative efficiency	1.00%	2.98%	4.92%
Efficiency adjustment	-4.8	-13.7	-22.4
<b>Recommended efficient operating expenditure</b>	471.5	447.3	432.9
<b>Variance (recommended - proposed)</b>	-12.0	-22.1	-32.9
<b>Variance (%)</b>	-2.5%	-4.7%	-7.1%

**Recommended prudent and efficient capital expenditure**

Our recommended level of prudent and efficient operating expenditure for SA Water for the regulatory period has been developed in line with our methodology as follows:

► **Adjustments for better information provided by SA Water**

SA Water advised us of two areas that impact on its original submission and that we have taken into account in reaching our recommended level of capital expenditure:

1. It has already committed to around \$50M worth of capital expenditure. However, this expenditure is expressed in outturn prices. We have adjusted these costs to the common price base of March 2012, reducing the proposed capital expenditure by \$2.3M.

2. Since the time of finalising its submission, SA Water has continued to develop its capital expenditure projects. As a result, the proposed costs for some projects have now changed. While there is significant variance for some individual projects, the overall impact of this 'High level adjustment' is a reduction in proposed capital expenditure of \$1.8M.

▶ **Adjustment of the timing of items of expenditure where there is sufficient evidence that the timing proposed by SA Water is unrealistic.**

We found insufficient evidence to support the proposed timing of the upgrade to the Murray Bridge WWTP and recommend that this expenditure be deferred beyond the regulatory period. \$107M of expenditure had been included in the regulatory period for this project. We have made allowance for only some investigation costs (\$1.75M).

SA Water submitted at our review that the proposed capital works to Aldinga WWTP should be deferred following an updated review of inflow volumes. We have therefore removed the capital expenditure relating to these works from the recommend expenditure (\$34.8M) but we have made allowance for only some investigation costs (\$1.75M).

We found that the contingencies allowed for the Hendon Queensbury PS upgrade were excessive given that the solution is well developed. We recommend that the contingencies be halved, reducing the allowed expenditure by \$0.7M

SA Water has proposed expenditure for M&E plant renewal at treatment plants that is three times greater than historic levels. We cannot see that this is justified given current performance and recommend that this expenditure be reduced by 10% (\$5.3M).

SA Water has proposed expenditure for the regulatory period on M&E plant renewal –networks four times higher than historic levels. We cannot see that this is justified given current performance and recommend that this expenditure be reduced by 20% (\$9.04M).

SA Water has proposed expenditure for the regulatory period on structures renewal –networks three times higher than historic levels. We cannot see that this is justified given current performance and recommend that this expenditure be reduced by 10% (\$2.8M).

▶ **Adjustment of any top down factors applied to expenditure categories where we believe that the factors applied by SA Water are unreasonable.**

As set out in Section 8.3, we recommend that no real cost escalation be applied to SA Water's proposed capital expenditure

▶ **Efficiency**

As set out in Section 8.5, we propose that SA Water's proposed capital expenditure be subject to a continuing efficiency target of 0.5% per annum and a catch-up efficiency target of 0.6% per annum.

The following table details our recommended prudent and efficient capital expenditure following the application of the adjustments and efficiency factors outlined above.

**Recommended prudent and efficient capital expenditure**

\$M March 2012	2013/14	2014/15	2015/16	Total
<b>Proposed capital expenditure</b>	342.5	348.9	412.3	1103.6
<b>Adjust committed projects back to \$Mar12 price base</b>	-1.9	-0.4	-0.1	-2.3
<b>SA Water High Level adjustment to project costs</b>	-0.7	8.3	-9.4	-1.8
<b>Expenditure adjustment</b>				
Deferral of Murray Bridge WWTP	-7.8	-19.0	-78.8	-105.5
Deferral of Aldinga WWTP	-1.0	-14.8	-17.3	-33.0
Reduced contingency on Hendon Upgrade	-0.7	0.0	0.0	-0.7
Reduced M&E Plant Renewal – Treatment Plants (10%)	-1.3	-1.8	-2.2	-5.3
Reduced M&E Plant Renewals – Networks (20%)	-3.2	-3.6	-2.3	-9.0
Reduced Structures Renewal – Networks (10%)	-1.0	-0.9	-0.9	-2.8
<b>Total - Adjusted proposed capital expenditure</b>	<b>324.9</b>	<b>316.8</b>	<b>301.4</b>	<b>943.2</b>
<b>Efficiency adjustment</b>				
Continuing efficiency	0.50%	0.50%	0.50%	
Catch-up efficiency	0.60%	0.60%	0.60%	
<b>Total cumulative efficiency (compounded)</b>	<b>1.10%</b>	<b>2.19%</b>	<b>3.26%</b>	
Committed capital expenditure	30.3	17.4	0.6	48.3
Adjusted capital expenditure net of committed capital expenditure	294.6	299.5	300.8	894.9
Efficiency adjustment	-3.2	-6.6	-9.8	-19.6
<b>Recommended efficient capital expenditure</b>	<b>321.7</b>	<b>310.3</b>	<b>291.6</b>	<b>923.6</b>
<b>Variance (recommended - proposed)</b>	<b>-20.8</b>	<b>-38.6</b>	<b>-120.7</b>	<b>-180.1</b>
<b>Variance (%)</b>	<b>-6.1%</b>	<b>-11.1%</b>	<b>-29.3%</b>	<b>-16.3%</b>

## Glossary

Term	Definition
ABS	Australian Bureau of Statistics
AC	Asbestos cement
ADP	Adelaide Desalination Plant
ADWG	Australian Drinking Water Guidelines
BOD	Biochemical Oxygen Demand
CEO	Chief Executive Officer
CI	Cast iron
CPI	Consumer Price Index
CPMM	Corporate Project Management Methodology
DICL	Ductile iron concrete lined
ESCoSA	Essential Services Commission of South Australia
FFA	Full Financial Approval
FMECA	Failure modes, effects and criticality
FTE	Full Time Equivalent
GIS	Geographical Information System
GRV	Gross replacement value
IS	Information Services
KPI	Key Performance Indicator
MSCL	Mild steel concrete lined
NPR	National Performance Report
NSIS	North-South Interconnection System
NWC	National Water Commission
NWI	National Water Initiative
O&M	Operations & Maintenance
OH&S	Occupational Health & Safety
PAS 55	Publically Available Standard on Asset Management
PE	Polyethylene
PMF	Probable Maximum Flood
PMP	Project Management and Procurement

Term	Definition
PVC	Poly vinyl chloride
PWC	Public Works Committee
PWQ	Pending Work Queue
RBP	Regulatory Business Proposal
RPI	Retail Price Index
SA	South Australia
SA Water	South Australian Water Corporation
SS	Suspended solids
SCADA	System Control and Data Acquisition
STP	Sewage Treatment Plant
TN	Total Nitrogen
WSAA	Water Services Association of Australia
WDV	Written down value
WTP	Water Treatment Plant
WWTP	Wastewater treatment plant

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APPENDIX A Capital expenditure project review summaries

# 1 Introduction

## 1.1 Overview

The Essential Services Commission of South Australia (ESCoSA) is the independent economic regulator of essential services in South Australia. In undertaking its regulatory functions, the Commission's primary objective is the "protection of the long-term interests of South Australian consumers with respect to the price, quality and reliability of essential services".

In 2009, the Government of South Australia announced reforms to the water sector in a plan entitled "*Water for Good: a plan to ensure our water future to 2050*"<sup>3</sup>. Action 70 of *Water for Good* states that the Government will:

*Appoint ESCoSA as the independent economic regulator for monopoly supplies of urban and regional water and wastewater services in South Australia. This will apply to SA Water's potable water and wastewater services in the first instances.*

To deliver this objective, the South Australian Government has put in place the Water Industry Act 2012<sup>4</sup>. Under the Act, the water industry became a regulated industry for the purposes of the Essential Services Commission Act from 1 July 2012 and therefore subject to the regulatory powers of the Essential Services Commission.

In November 2011, the Commission released its proposed approach to regulation of SA Water. Some of the intention of this document was superseded by a draft Pricing Order released by the State Government on 22 June 2012. Amongst other things, the Order sets out the following requirements for the Commission to follow in relation to the first regulatory period:

- ▶ To adopt a regulatory period of 1 July 2013 to 30 June 2016.
- ▶ To comply with the National Water Initiative (NWI) pricing principles (other than the Principles for Recovering the Costs of Water Planning and Management Activities).
- ▶ To adopt a revenue cap or average revenue cap as the form of price regulation for SA Water's drinking water and sewerage services.
- ▶ To adopt a specified initial regulated asset base.
- ▶ To treat identified non-commercial activities, externalities and water and planning management charges in a specified manner.

The Commission subsequently released its final statement of approach in July 2012. This document sets out how the allowable revenue for SA Water will be determined. An important part of determining the allowable revenue is to subject the businesses' operating and capital expenditure forecasts to review so that only prudent and efficient costs are included in the calculation of the revenue requirement. This review of operating and capital costs is the purpose of this assignment.

## 1.2 Scope of this report

Cardno in association with Atkins were appointed by ESCoSA to determine the prudent and efficient level of capital expenditure and operating expenditure required by SA Water over the period 1 July 2013 to 30 June 2016. For both the capital and operating expenditure assessments, where it is recommended that SA Water's proposed expenditure is not prudent and efficient, recommendation is to be made to the Commission as to what a prudent and efficient level of expenditure is believed to be.

<sup>3</sup> Water for Good – <http://www.waterforgood.sa.gov.au>

<sup>4</sup> Water Industry Act 2012 - <http://www.legislation.sa.gov.au/lz/c/a/water%20industry%20act%202012/current/2012.10.un.pdf>

The specific scope set by the Commission is reproduced as follows:

### 1.2.1 Review of capital expenditure

ESCoSA requires advice on SA Water's capital expenditure plans, specifically:

- ▶ A review of SA Water's planning and asset management capability.
- ▶ A view of planned capital expenditure on a 'whole of system' basis, taking account of a long-term planning horizon.
- ▶ An engineering judgement as to the requirement for the proposed projects/programs.
- ▶ A view on the timing and deliverability of the proposed projects/programs.
- ▶ A view on the options considered in developing the projects/programs, including identification of any further options that should be considered.
- ▶ A comparison of costs/unit costs of the planned project/programs versus similar projects in other jurisdictions.
- ▶ Where a project deferral is recommended, a re-phasing of expenditure should be provided.
- ▶ An appropriately supported view on the reasonableness of SA Water's assumptions on cost escalation/efficiency on capital costs across the price determination period (e.g. wages growth, productivity assumptions, materials costs).
- ▶ Any further relevant considerations.

### 1.2.2 Review of operating expenditure

ESCoSA requires advice on SA Water's operating expenditure plans, including the following:

- ▶ A review of the efficiency of SA Water's proposed operating expenditure, including both directly attributed costs and allocated costs for regulated services and excluded services.
- ▶ Identification and analysis of SA Water's potential for cost reductions/efficiency gains.
- ▶ Identification and analysis of any areas of operations where planned expenditure is considered inadequate.
- ▶ A view on the reasonableness of SA Water's attribution of costs between regulated, excluded and unregulated services, identifying any adjustments as necessary.
- ▶ A review of the operating, maintenance, and administrative costs related to Adelaide Desalination Plant.
- ▶ An appropriately supported view on the reasonableness of SA Water's assumptions on cost escalation/efficiency on operating costs across the price determination period (e.g. wages growth, productivity assumptions, materials costs).
- ▶ Any further relevant considerations.

## 1.3 Overview of SA Water

The South Australian Water Corporation (SA Water) is a government enterprise, wholly owned by the Government of South Australia, established by the *South Australian Water Corporation Act 1994*. Prior to this time, water and sewerage services were provided by the State Engineering and Water Supply Department.

SA Water provides water and wastewater services to approximately 1.5 million customers via over 700,000 connection points across both metropolitan Adelaide and country South Australia. SA Water<sup>5</sup> owns assets with a replacement cost of more than \$13 billion, including:

- ▶ More than 26,500km of water mains.
- ▶ Approximately 8,700km of sewer mains.
- ▶ 30 water treatment plants.
- ▶ 23 wastewater treatment plants.

Table 1-1 lists key information relating to SA Water's assets and operations.

**Table 1-1 SA Water key statistics<sup>6</sup>**

<b>Assets</b>	<b>Metropolitan</b>	<b>Country</b>	<b>Total</b>
Length of water mains (km)	9,020	17,532	26,552
Length of sewers (km)	7,252	1,451	8,703
Length of recycled water mains (km)	127	9	136
Water treatment plants	6	24	30
Wastewater treatment plants	4	19	23
<b>Accounts</b>	<b>Metropolitan</b>	<b>Country</b>	<b>Total</b>
Accounts billed			776,172
Estimated population served - Water	1,140,000	417,000	1,557,000
Estimated population served - Wastewater	1,076,000	163,000	1,239,000
<b>Demand</b>	<b>Metropolitan</b>	<b>Country</b>	<b>Total</b>
Average volume water delivered state wide for past five years (ML)	140,484	78,626	219,110
Average residential consumption per household (kL)			164.3
Highest daily consumption recorded in 24 hours to 8am (ML) – metro only	758		
Average residential consumption per household (kL/year)	170.6	144.6	
<b>Water sources</b>	<b>2010/11</b>		
Total water supplied (ML)	196,666		
% provided by River Murray	46%		
% provided by surface water	48%		
% provided by ground water	6%		
% provided by sea water	<0.1%		

## 1.4 Regulatory environment

SA Water's operations are primarily governed by the *South Australian Water Corporation Act 1994* and the *Public Corporations Act 1993*. The *Water Industry Act 2012* came into force from 1 July 2012, replacing a number of other pieces of legislation that previously provided SA Water with the powers to operate and maintain its infrastructure and charge for these services.

The key legislation guiding SA Water are summarised in Table 1-2.

<sup>5</sup> Web sourced from SA Water homepage (<http://www.sawater.com.au/SAWater/AboutUs/AboutSAWater/Proudly+South+Australian.htm>) as of 27 September 2012.

<sup>6</sup> Sourced from SA Water Corporation Annual Report 2010/11

**Table 1-2 Legislative framework**

Legislation	Description
South Australian Water Corporation Act 1994	This Act establishes the SA Water Corporation and makes it subject to the <i>Public Corporations Act 1993</i> . SA Water's primary functions, as set out in the Act, include: <ul style="list-style-type: none"> <li>▶ Supply of water by means of reticulated systems;</li> <li>▶ Storage, treatment and supply of bulk water; and</li> <li>▶ Removal and treatment of wastewater by means of sewerage systems.</li> </ul>
Public Corporations Act 1993	This Act requires SA Water to operate as a commercial entity in accordance with a charter, performance statement or other direction issued by the Minister.
Water Industry Act 2012*	The Water Industry Act regulates the South Australian water industry, including appointing the ESCoSA as economic regulator, licensing retail service providers, and ensuring appropriate technical standards for water and sewerage infrastructure and plumbing.
Waterworks Act 1932*	The Waterworks Act empowers the Corporation to construct and operate water supply systems and to charge for the provision of this service. SA Water supplies potable water throughout the State pursuant to the provisions of this Act.
Sewerage Act 1929*	This Act empowers the Corporation to construct and operate sewerage systems. Sewerage services provided by SA Water cover metropolitan Adelaide and 17 country centres.
Metropolitan Drainage Act 1935	The Metropolitan Drainage Act provides for flood mitigation works on the River Torrens, Sturt River, and the Brownhill and Keswick Creeks.
Rates and Land Tax Remission Act 1986	The Rates and Land Tax Remission Act provides for rates concessions for various rates to be granted to eligible pensioners. The remission scheme is funded by the Government but administered by SA Water.

\*The Water Industry Act will be fully operational from 1 January 2013, at which time the Waterworks Act 1932, Sewerage Act 1929 and the Water Conservation Act 1936 will be repealed and no longer apply.

SA Water's operations are also subject to regulation and oversight by a number of entities who are conferred powers under different items of legislation. The main entities involved in regulating the South Australian water sector are detailed in Table 1-3. A number of these other bodies set standards, with which SA Water must comply in delivering services to consumers.

**Table 1-3 Entities involved in the regulation of the water industry<sup>7</sup>**

Regulators	Overview of role within the water industry	Relevant legislation
<b>Regulators</b>		
Department of Environment, Water and Natural Resources	Regulates state water resources, and other natural resource management matters	Natural Resources Management Act 2003
SA Health	Regulates health aspects relating to the provision of drinking water supplies.	Safe Drinking Water Act 2011
Office of the Technical Regulator	Technical regulator responsible for safety and technical matters.	Water Industry Act 2012
Environmental Protection Authority	Regulates the environmental impact of water businesses.	Environmental Protection Act 1993
Treasurer	Sets application and issue licence fees for water industry entities, issue Ministerial directions (billing)	Water Industry Act 2012

<sup>7</sup> Extracts from the Economic Regulation of SA Water's Revenues – Statement of Approach paper by ESCoSA, July 2012 (<http://www.escosa.sa.gov.au/projects/162/economic-regulation-of-the-south-australian-water-industry.aspx#stage-720=&stage-list=7>)

Regulators	Overview of role within the water industry	Relevant legislation
	and meters), and Pricing Orders.	
Minister for Water	Administers the Water Industry Act, and responsible for non-regulatory instrument (e.g. schemes) and appointing water industry entities.	Water Industry Act 2012
Energy (and Water) Ombudsman	Handles complaints of customers of water licensees.	Water Industry Act 2012 Corporations Act 2001
<b>Other Agencies</b>		
Consumer and Business Services	Regulates the relationship between landlords and tenants in relation to the payment of rates and charges for water and sewerage services. BCS also regulates the professional conduct of plumbers.	Residential Tenancies Act 1995 Plumbers, Gasfitters and Electricians Act 1995
Department for Communities and Social Inclusion	Sets hardship and concession policy	Water Industry Act 2012

Under the regulatory environment in South Australia, ESCoSA's role is limited to the economic regulation of SA Water. Environmental, public health and affordability standards are set by other bodies. Therefore, in determining the prudent and efficient expenditure requirements of SA Water, consideration must be given to the requirements set by these other bodies. ESCoSA has sought to set customer service standards for the forthcoming regulatory period that are consistent with historical performance.

## 1.5 Review methodology

The Cardno-Atkins methodology for determining the efficient level of capital and operating expenditure required by SA Water is based on the hypothesis of an efficient 'frontier' organisation competing in an open market to deliver services to customers. Under this framework, efficiency gains made by the frontier company are referred to as continuing efficiency, with catch-up applied to companies that are behind the frontier company, on the assumption that that they have greater scope to make improvements. We have compared the business processes and systems and outcomes of SA Water against this standard of the frontier business, and assessed the level of efficiency gains that may be achieved by the organisation.

Before applying efficiency gains, we have adjusted SA Water's expenditure proposals in the following areas:

- ▶ Adjustments to reflect better information being available.
- ▶ Rebasing of SA Water's expenditure profiles where required to achieve a common price base.
- ▶ Removal of items of expenditure that are determined to be unjustified in the regulatory period.
- ▶ Adjustment to the timing of items of expenditure where there is sufficient evidence that the timing proposed by SA Water is unrealistic.
- ▶ Adjustment of any top down factors applied to expenditure categories where we believe that the factors applied by SA Water are unreasonable (for example cost contingencies and real escalation factors).

Following these adjustments, continuing and catch-up efficiency factors are applied as appropriate to arrive at our determined level of prudent and efficient operating and capital expenditure.

Continuing efficiency is the scope for top performing or frontier companies to continue to improve their efficiency. It reflects the continuing efficiencies being gained across all major sectors through innovation and new technologies. The continuing improvement element of efficiency relates to the increased productivity derived from process innovation and new technology that all well performing businesses should achieve, including Frontier companies. This applies to a range of industry sectors.

Catch-up efficiency is the productivity gains that may be realised when an agency moves from its current position to that of the frontier utility. Our assessment of catch-up efficiency is based on a qualitative, process

based assessment of SA Water against leading practice for utilities in Australia and internationally. It is based on the professional judgement of our team formed from their broad and in-depth understanding of these processes across many utilities in Australia and internationally. Our assessment was based on identified improvements to processes and business opportunities. These improvements would generate efficiencies in future years to enable the agency to move towards the frontier utility.

## 1.6 Price base

ESCoSA required that SA Water submit for the purposes of this review its actual and estimated costs as follows:

- ▶ Nominal (money of the day) prices for all actual expenditure up to and including 2011/12.
- ▶ Real (constant dollar) prices at March 2012 values for all other expenditure<sup>8</sup>.

SA Water has followed this directive, other than for committed capital expenditure projects (c.\$50m), which have been stated in nominal dollars. This report presents proposed costs in the same price base of March 2012 as provided by SA Water unless otherwise noted.

ESCoSA requires us to comment on the escalation factors proposed by SA Water. We comment on the proposed escalation factors for operating costs in Section 7.3 and for capital costs in Section 8.3.

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<sup>8</sup> ESCoSA, Review of SA Water's Prices: 2013/14 – 2015/16 Guidance Paper, February 2012, p. 11.

## 2 Profile of SA Water

### 2.1 Strategic Management

SA Water has published a Strategic Plan for the period 2012 – 2016. This document sets out SA Water's purpose as:

*Delivering water and wastewater services in efficient, responsive, sustainable and accountable ways.*

The Strategic Plan also sets out four strategic priorities supported by strategies and initiatives. These are summarised in Table 2-1.

Table 2-1 SA Water's strategic priorities and key strategies<sup>9</sup>

Strategic Priorities	Statement of Intent	Key initiatives that support SA Water's strategies
Customers & Community	To achieve customer satisfaction by delivering the services they value, enhance our reputation within the community and build strategic relationships with our key stakeholders.	<ul style="list-style-type: none"> <li>▶ Customer service research program</li> <li>▶ Advisory Councils for residential and business consumers</li> <li>▶ Customer service charter detailing our commitments and expectations</li> <li>▶ 24/7 customer contact centre</li> <li>▶ Customer assist program for customers experiencing difficulties</li> <li>▶ Membership of Energy &amp; Water Ombudsman SA scheme</li> <li>▶ Communications and media relations</li> <li>▶ Education and community investment programs</li> <li>▶ Community engagement for major capital projects</li> <li>▶ Local Government liaison</li> <li>▶ Participation in industry networks and forums</li> </ul>
Quality & Delivery	To deliver water and wastewater services that are fit for purpose, cost effective and comply with regulatory requirements	<ul style="list-style-type: none"> <li>▶ Infrastructure operation</li> <li>▶ Drinking Water Quality Management System and water treatment</li> </ul>

<sup>9</sup> SA Water Strategic Plan 2012-2016.

Strategic Priorities	Statement of Intent	Key initiatives that support SA Water's strategies
		<ul style="list-style-type: none"> <li>▶ Sampling and analytical testing services</li> <li>▶ Water and wastewater incident notification</li> <li>▶ Trade waste audits and monitoring</li> <li>▶ 24/7 Operations Control Centre management</li> <li>▶ Emergency management planning</li> <li>▶ Land development and connections services</li> <li>▶ Joint Research Alliance</li> <li>▶ Environmental improvement programs</li> <li>▶ Sludge and biosolid management</li> <li>▶ Management of odour and noise at SA Water sites</li> <li>▶ Climate Change Sector Agreement delivery</li> <li>▶ Energy efficiency planning</li> <li>▶ River Murray Operations</li> <li>▶ Services to remote Aboriginal communities</li> <li>▶ Metropolitan drainage management Operating Cost per connection</li> </ul>
Business Success	To ensure long term financial success, with a safe, skilled and committed workforce demonstrating excellence in regulatory management and governance	<ul style="list-style-type: none"> <li>▶ Regulatory Business Proposal development</li> <li>▶ Review and establish network access regime</li> <li>▶ Strategic management framework implementation</li> <li>▶ Corporate risk management and internal audit</li> <li>▶ Corporate policy and legislative compliance framework</li> <li>▶ Information services, applications and infrastructure</li> <li>▶ Financial Governance, Commercial Management and</li> <li>▶ Treasury Services</li> </ul>

Strategic Priorities	Statement of Intent	Key initiatives that support SA Water's strategies
		<ul style="list-style-type: none"> <li>▶ Water and wastewater pricing structures</li> <li>▶ Procurement frameworks (including energy) to manage price risk</li> <li>▶ Growth of non-regulated services, including AWQC and the Berri (WET) Workshop</li> <li>▶ Employer branding and attraction</li> <li>▶ Leadership capability and skills development</li> <li>▶ Review of the performance management framework</li> <li>▶ Staff engagement survey and SA Water Values week</li> <li>▶ Staff diversity programs</li> <li>▶ Safety leadership programs</li> <li>▶ Workforce planning programs</li> <li>▶ Hazard Management planning for critical OHS risks</li> <li>▶ Health and wellbeing program for employees</li> <li>▶ Innovation framework development Regulatory Compliance (ESCoSA)</li> <li>▶ Systems Accreditation/Certification</li> <li>▶ Core Systems Availability</li> </ul>
Planning for the Future	To plan for a sustainable future through integrated water planning and stewardship of our physical and natural assets	<ul style="list-style-type: none"> <li>▶ Water resource and security portfolio strategy</li> <li>▶ Develop and maintain robust demand forecast model</li> <li>▶ Stormwater and wastewater planning</li> <li>▶ Long term plans for system capacity augmentation</li> <li>▶ 25 year risk based asset management plans</li> <li>▶ Asset condition monitoring strategy</li> <li>▶ Reliability centred maintenance plans to mitigate impact of asset failure</li> <li>▶ Land use and fire management programs for critical land holdings</li> </ul>

Strategic Priorities	Statement of Intent	Key initiatives that support SA Water’s strategies
		<ul style="list-style-type: none"> <li>▶ Portfolio management and capital prioritisation framework</li> <li>▶ Project Management and Procurement (PMP) contract for metropolitan capital project delivery</li> <li>▶ Deliver key growth projects for water and wastewater services</li> <li>▶ Facilities management services</li> </ul>

The initiatives detailed by SA Water represent a combination of activities that it is legally obliged to undertake and activities that it has more discretion over. For all activities undertaken by SA Water, the purpose of this review is to scrutinise the justification for undertaking the activity to confirm that there is a clear need for it. That is, that the expenditure is prudent. Where an activity is required by legislation or government direction, the need is generally readily identified. For other activities, the need may not be as readily identified. For activities deemed prudent, the purpose of this review is then to determine that SA Water undertakes for the least possible life cycle cost. That is, efficiently.

While inclusion of an activity in this strategic plan demonstrates commitment at the Board and Executive level to the activity, our review will seek to find further justification. Most importantly, we will attempt to determine to what extent activities are supported by customers. However, under the current regulatory arrangements, little of SA Water’s business activities have been tested by customer opinion. This provides a limit to the extent to which we are able to test the justification for expenditure.

## 2.2 Challenges and opportunities

SA Water, like all water utilities, faces challenges in delivering its service efficiently and effectively due to the particular circumstances of its operating environment. Table 2-2 details the challenges and opportunities that SA Water has identified and detailed in its Strategic Plan 2012 – 2016.

Table 2-2 SA Water's challenges and opportunities<sup>10</sup>

Challenges / Opportunities	Descriptions
Safety	SA Water currently has a reasonable record in regard to safety, due to targeted organisational safety programs. However, this record needs to be improved, never compromised and driven by all employees and contractors.
Demand and pricing	Water restrictions and changes in water use patterns have seen a significant fall in water consumption over the past decade, which has negatively affected revenue generation. With significant investment in water security infrastructure in recent years, water prices have also risen sharply. Further research will enable SA Water to understand better the balance between prices and service standards expected by customers.
Asset reliability	SA Water has an extensive portfolio of physical and natural assets, which includes a mix of ageing assets and brand new, high-cost capital investments. Appropriate lifecycle planning, management and maintenance will ensure continuity in supply and quality while maintaining the best value for customers.
Changing demographics	The South Australian population, as well as SA Water's customer demographics, are changing. The population is both increasing and ageing, while also consolidating onto smaller land holdings. SA Water needs to gain a greater appreciation of what this means for domestic water use and the customer's ability to pay.
Regulatory environment	The introduction of independent economic regulation from 1 July 2013 reinforces the objective to be prudent and efficient. SA Water must also ensure that all existing regulatory requirements (in terms of the environment, health and water) are maintained.
Competition	It is likely that over time SA Water will face pressure from new industry participants. This may come either in the form of third party access to SA Water's infrastructure or the provision of water services to smaller groups of customers from independent sources like small desalination plants.
Changing workforce	SA Water's workforce includes many employees reaching retirement age. We are also experiencing competition from rapidly expanding industries (like mining) for certain key skills. SA Water needs to remain competitive as an employer of choice in order to maintain business operations effectively.
Innovation	The source of many of SA Water's past successes has been innovation. While innovation is a means, rather than an end in itself, SA Water will always be looking for ways to improve in all areas. Innovation will be the key to responding proactively to many of the challenges and opportunities identified within the Strategic Plan.
Changing climate	The climate is changing. Over time, temperatures are expected to increase and rainfall reduce (although rainfall will most likely be more intense when it does occur). Also, due to market factors, energy prices will rise. SA Water must be prepared for climate change, in terms of water security (which may also be affected by the future Murray-Darling Basin Plan) and exposure to the energy market while managing the associated impacts on customers.
Network capability	Projections show a significant increase in Adelaide's population over the next 30 years. Many outer urban areas will expand and there will also be a greater focus on infill housing in the metropolitan area. SA Water needs to ensure that networks can cater for this growth.
Water quality	South Australia has always faced water quality challenges due to poor quality source water. In order to reduce risks to customers, SA Water needs to continue to enhance detection and treatment processes in accordance with legal frameworks.

Throughout our review, we have considered these challenges and opportunities to the extent that they impact on SA Water's expenditure. We believe that a well-run and efficient business will always look to mitigate the impact of changed circumstances and new challenges so that full costs are not passed on to

<sup>10</sup> Sourced from SA Water Strategic Plan 2012-2016

customers. Equally, a well-run and efficient business should recognise opportunities for efficiencies through for example, improved work practices and adopting new technologies.

## 2.3 Cost drivers

SA Water uses the following drivers for categorising expenditures within its future expenditure model:

Table 2-3 SA Water's cost drivers

Expenditures	Cost Drivers	Descriptions
Capital	Asset renewal	Projects driven by the need to renew existing infrastructure to maintain the reliability of the level of service to customers that is provided by that infrastructure. <i>Asset renewal breakdowns:</i> <ul style="list-style-type: none"> <li>▶ Pipe networks</li> <li>▶ Mechanical &amp; electrical</li> <li>▶ Structures</li> <li>▶ Others</li> </ul>
	External obligations	Expenditure required to meet external obligations principally related to water quality, environment and safety <i>External obligations breakdowns:</i> <ul style="list-style-type: none"> <li>▶ Safety</li> <li>▶ Water quality management</li> <li>▶ Environmental compliance</li> </ul>
	System growth	Projects that are required to accommodate growth in demand and ensure that the required standards of service are maintained and continue reliably to customers <i>System growth breakdowns:</i> <ul style="list-style-type: none"> <li>▶ Pipe networks</li> <li>▶ Treatment plants</li> </ul>
	Other	Expenditure necessary for provision of services attributable to other drivers, such as expenditure to extend systems that are used to monitor infrastructure <i>Other breakdowns:</i> <ul style="list-style-type: none"> <li>▶ SCADA control and extensions</li> <li>▶ System planning tools</li> <li>▶ Miscellaneous</li> </ul>
	Drought response	A series of initiatives driven by the need to secure the water supply for SA Water's customers
Operating	Capital expenditure program impacts	Whereby operating expenditure is influenced by capital investment (a prime example is the proposed operating expenditure associated with the ADP and NSIS)
	Asset renewal/operating requirements	Whereby operating expenditure is influenced by the maintenance and operating requirements of existing assets (a prime example is the proposed changes to operating expenditure associated with asset condition monitoring)
	Changes in demand	Whereby operating expenditure is influenced by changes in water use, growth in the number of customers services by SA water or the volume of wastewater to be processed by SA water (a prime example is the proposed changes to electricity consumption associated with pumping of water from the River Murray)
	Compliance with obligations	Whereby operating expenditure is influenced by externally imposed obligations (a prime example is the proposed changes to operating expenditure associated with the carbon pricing mechanism).

## 2.4 Asset base

SA Water provides water and sewerage services across the state of South Australia. Figure 2-1 shows the location of SA Water's major assets. The majority of SA Water's assets are located in the Adelaide metropolitan area. In regional areas, some local governments provide sewerage services.

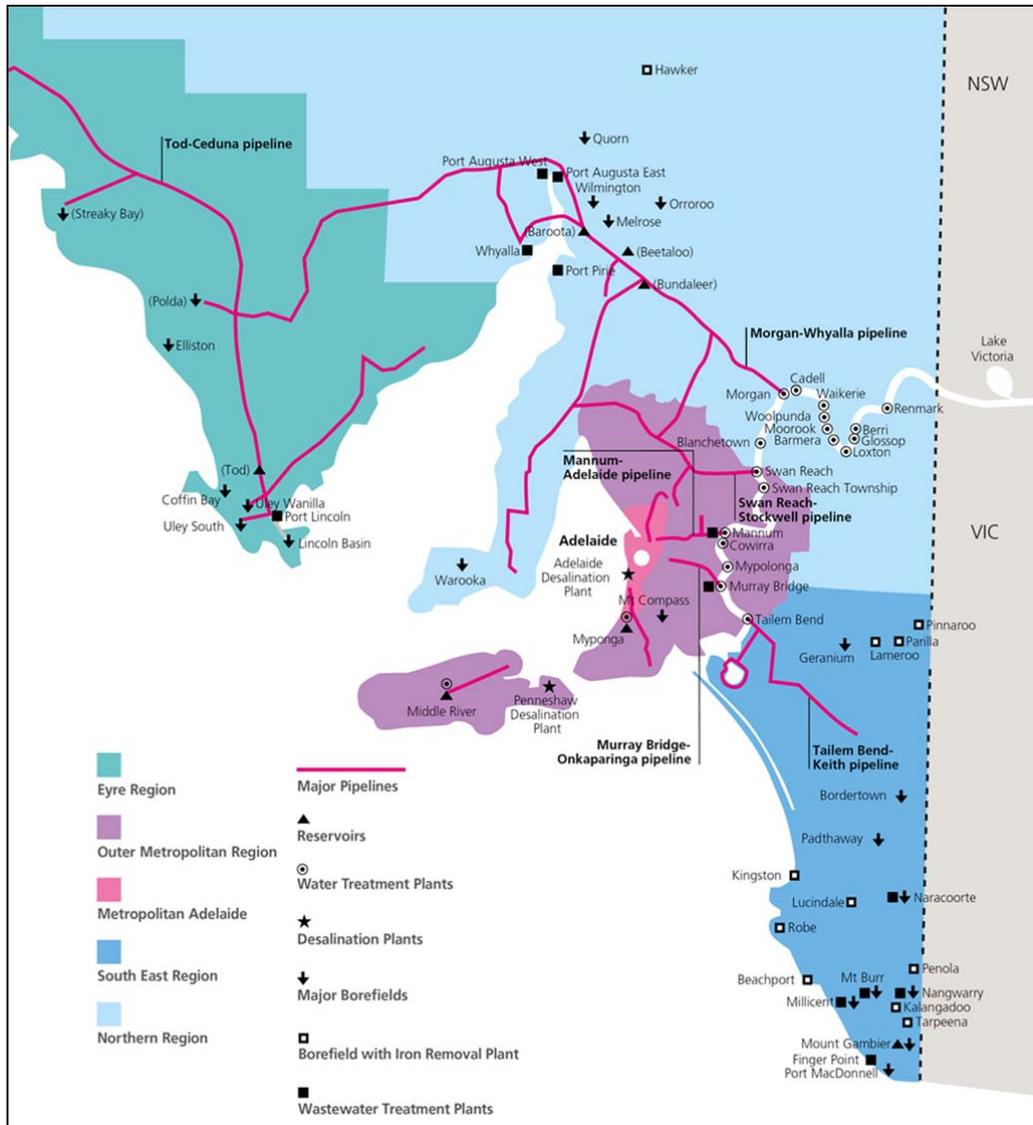


Figure 2-1 SA Water assets<sup>11</sup>

<sup>11</sup> Sourced from SA Water Regulatory Business Proposal  
Prepared for Essential Services Commission of South Australia  
Final Report

Table 2-4 provides a breakdown of the assets owned and operated by SA Water including replacement value.

Table 2-4 SA Water's infrastructure summary<sup>12</sup>

Asset class	Value			Total	Quantity	
	Gross replacement value (GRV)	Written down value (WDV)	% consumed (WDV/GRV)		Adelaide	Country
<b>Water</b>						
Water mains	4,552	2,611	43%	24,239 km	8,760 km	15,479 km
Major pipelines	2,673	1,594	40%	2,352 km	237 km	2,115 km
Water pump stations	478	210	56%	254	58	196
Water storage tanks	726	360	50%	514	149	365
Water treatment plants	995	570	43%	32	6	26
Large dams	1,177	579	51%	17	11	6
Bores and wells	38	24	37%	148	0	148
Connections (incl. Meters)	1018	673	34%	660,135	461,668	198,467
Water dosing stations	110	56	49%	80	9	71
Adelaide desalination plant	184	181	2%	1	1	1
Earth storages	109	53	51%	31	3	28
Leased water treatment plants	188	97	48%	10	0	10
<b>Wastewater</b>						
Wastewater mains	2,936	1,878	36%	8,712 km	7,276 km	1,436 km
Wastewater treatment plants	1,675	1021	39%	23	5	18
Wastewater pump stations	289	159	45%	584	355	229
Wastewater connections	1,077	579	46%	502,949	438,553	64,396
Leased wastewater treatment plants	27	23	15%	1	0	1
<b>Corporate and other</b>						
Land and buildings	432	389	10%			
Other	466	294	37%			
<b>Total</b>	<b>19,150</b>	<b>11,351</b>	<b>41%</b>			

SA Water is responsible for assets with replacement value of over \$19.1B. The asset categories with the highest replacement value are water mains (\$4.55B), wastewater mains (\$2.94B), major pipelines (\$2.67B) and wastewater treatment plants (\$1.68B). Based on this valuation data, 41% of the useful value across all of SA Water's assets has been consumed. This high-level measure shows that SA Water's assets are approaching 'middle age' as a whole. It is interesting to note that there is not a large variance in the spread of the proportion of value consumed by asset category with only three asset categories (water pump stations – 56%, large dams – 51% and earth storages – 51%) have more than half their useful value consumed.

<sup>12</sup> Provided by SA Water

This summary analysis suggests that there are no broad concerns over classes of SA Water's assets being near the end of their useful life. This is only true at a high level though and there will inevitably be individual assets requiring end of life replacement or rehabilitation.

## 2.5 Benchmarking

To inform our opinion of SA Water's performance and efficiency, we have benchmarked the organisation against other water utilities drawing on the comparative information published by the National Water Commission in its National Performance Reports for Urban Water Utilities. SA Water falls into the 'major utility' category, being those that have greater than 100,000 customers.

We recognise the limitations of benchmarking resulting from the varied circumstances of each utility, particularly the scope of their operations and their varying size and hence their differing ability to achieve economies of scale. Therefore, we have only made high level observations on the basis of this data. SA Water is a vertically integrated utility and therefore is best compared to Water Corporation, ACTEW and Hunter Water. The major utilities in Queensland, New South Wales and Victoria typically have the bulk supply and distribution-retail functions separated.

The metrics presented and the observations drawn from each is summarised in Table 2-5.

**Table 2-5 Observations from benchmarking of SA Water against other major utilities**

Figure	Benchmark metric	Observation
2-2	Population receiving water supply	SA Water is amongst a group of five water utilities across Australia (Water Corporation - Perth, Queensland Urban Utilities, Yarra Valley Water and South East Water) that serve between 1-2 million customers.
2-3	Water main breaks per 100km of water mains	For its Adelaide operations, SA Water has fewer than 20 water main breaks per 100km of mains. This is amongst the lower main break rates in the sample and suggests that SA Water's water mains are performing well
2-4	Sewerage main breaks and chokes per 100km of main	For its Adelaide operations, SA Water reports around 50 sewer main breaks and chokes per 100km of mains. This is amongst the highest break/choke rates in the sample and suggests that performance of SA Water's sewer mains may be improved.
2-5	Water losses	SA Water's rate of real losses is around the mid-range for the sample.
2-6	Water operating costs per property	SA Water has amongst the lowest operating costs for the water service amongst major utilities.
2-7	Sewerage operating costs per property	SA Water has the lowest operating costs for the sewerage service amongst major utilities, a position it has consistently held. Taken with the above result for water operating costs, SA Water has the lowest operating cost per property amongst the major utilities.
2-8	Average annual residential water supplied per property in 2010/11	In 2010/11, SA Water (Adelaide only) was amongst four utilities providing more than 150kL per annum per property. The other five utilities in the sample all supplied less than 150kL per property in the year.
2-9	Sewage collected per property in 2010/11	SA Water's Adelaide operations have the lowest volume of sewage collected per property amongst the major utilities. This is likely due to a combination of sewers being in comparatively good condition compared with other major utilities and the relatively dry climate, both of which lead to decreased inflow and infiltration in the network.
2-10	Percentage growth in total connected properties – sewerage	Growth in properties connected for sewerage has been amongst the lowest in the sample, lying between 1-1.5% from 2005/06 to 2010/11.
2-11	Percentage growth in total connected properties – water supply	Growth in properties connected for water has been amongst the lowest in the sample, lying between 1-1.5% from 2005/06 to 2010/11 although showing an increasing trend. This observation and that above for sewerage properties growth suggests that SA Water has not had to accommodate high growth in its operating area over the last 5 years. However, there will inevitably be localised growth 'hot spots' which have grown rapidly in this time.

Figure	Benchmark metric	Observation
2-12	Water quality complaints	SA Water has amongst the lowest levels of water quality complaints recorded for major utilities.
2-13	Sewerage capital expenditure per property	Capital expenditure per property on the sewerage service has increased in recent years from a low base. SA Water's recent level of capital expenditure on the sewerage service is now mid-range for major utilities
2-14	Water capital expenditure per property	Capital expenditure per property for the water service is dominated by the construction of the Adelaide desalination plant.

The graphs for each benchmark metric are shown following.

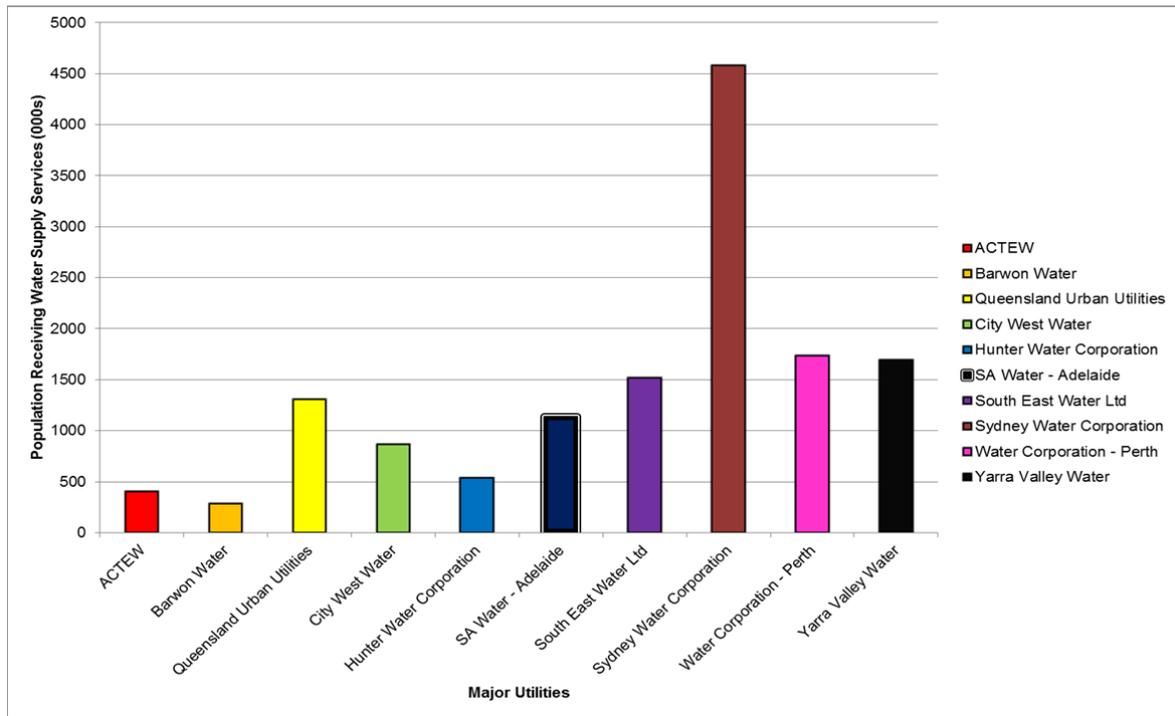


Figure 2-2 Population receiving water supply services in 2010-11

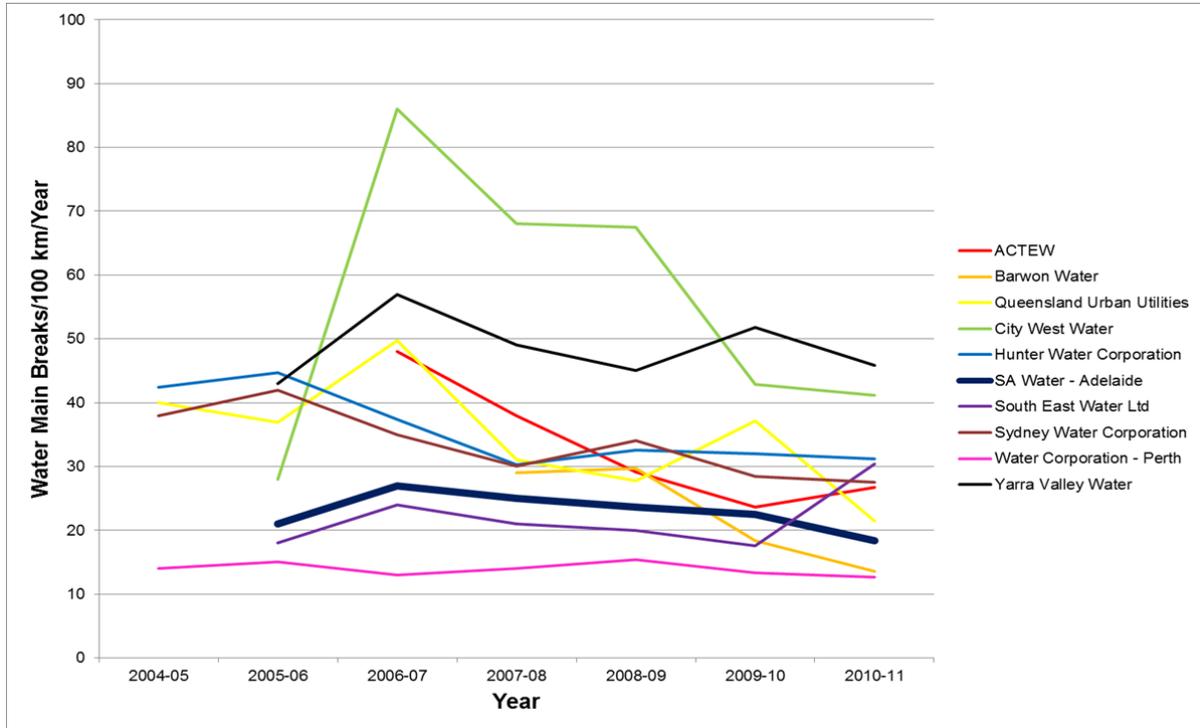


Figure 2-3 Water main breaks per 100 km

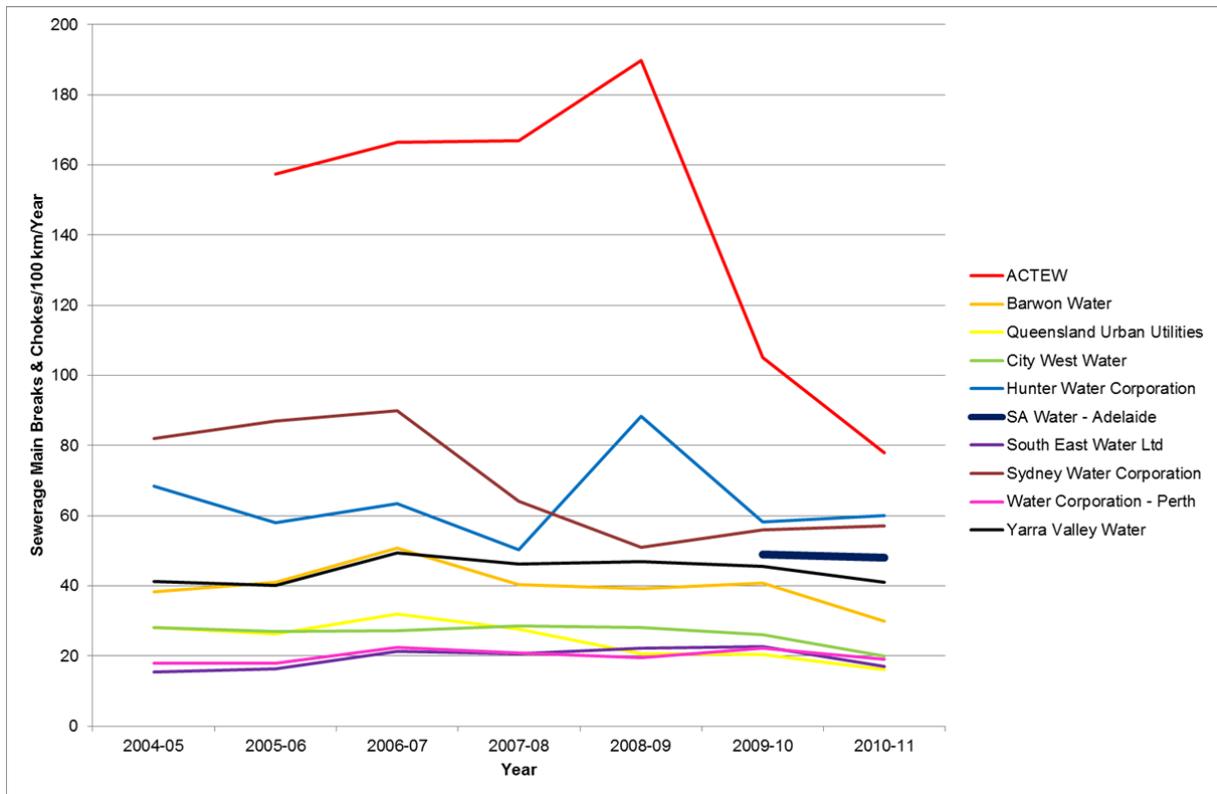


Figure 2-4 Sewerage main breaks and chokes per 100 km

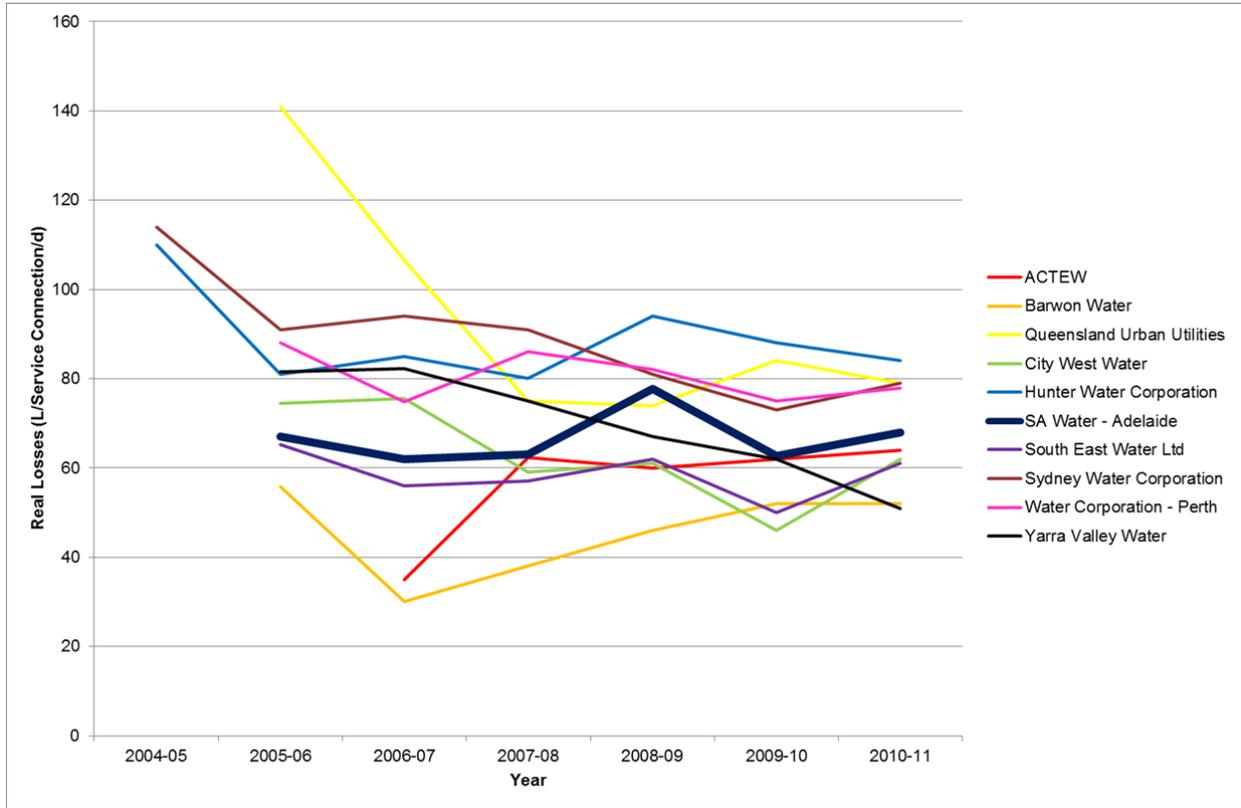


Figure 2-5 Water losses

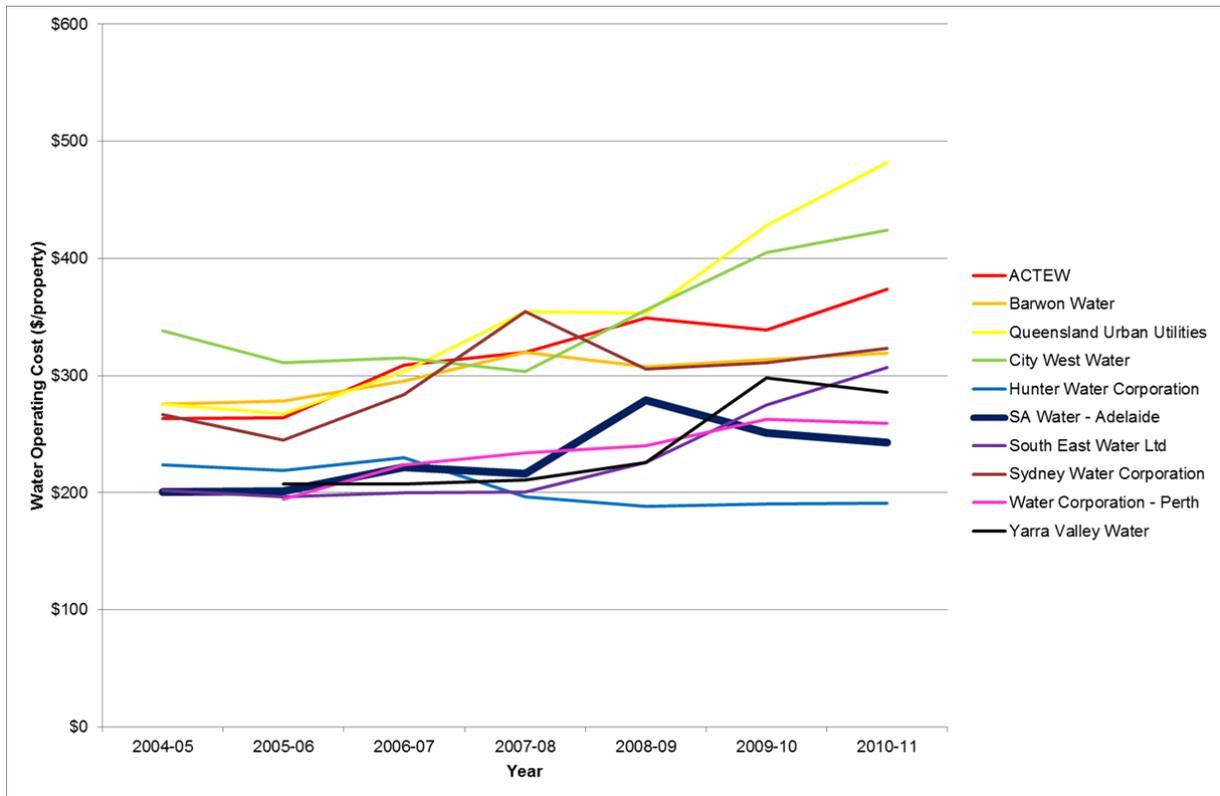


Figure 2-6 Water operating costs per property

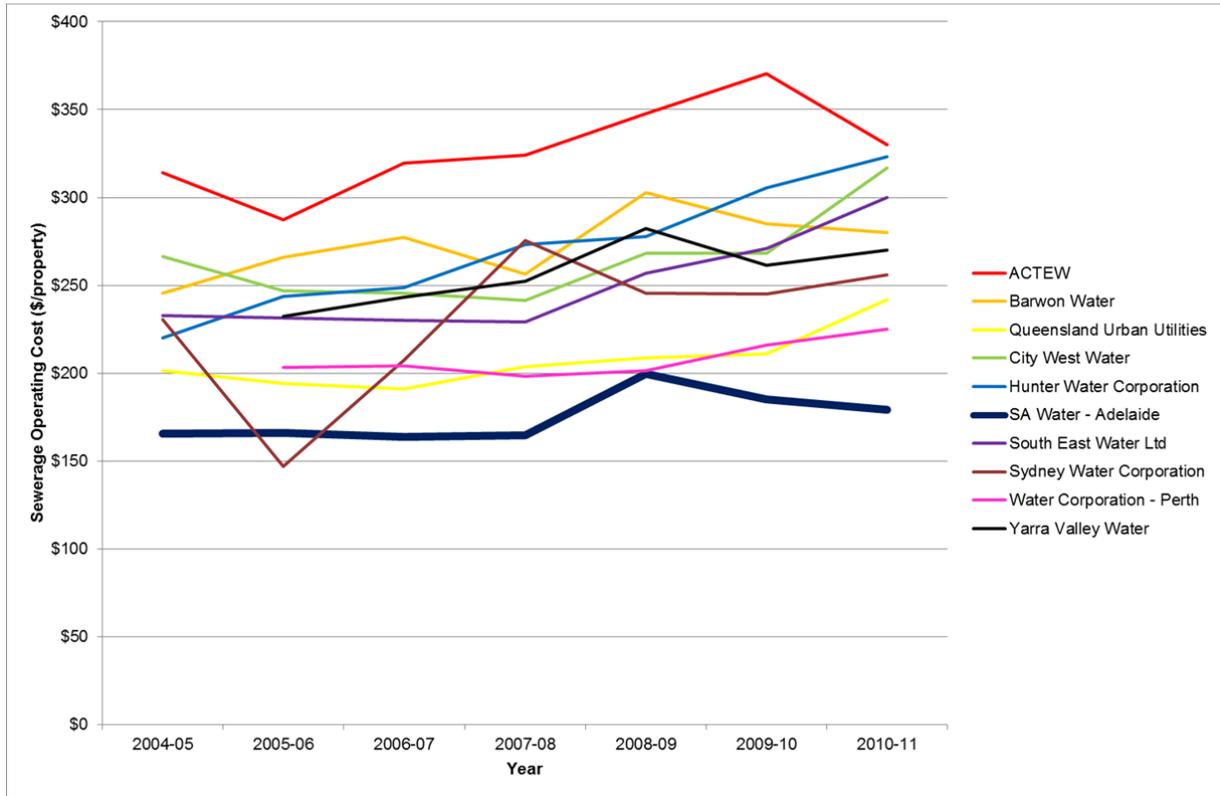


Figure 2-7 Sewerage operating costs per property

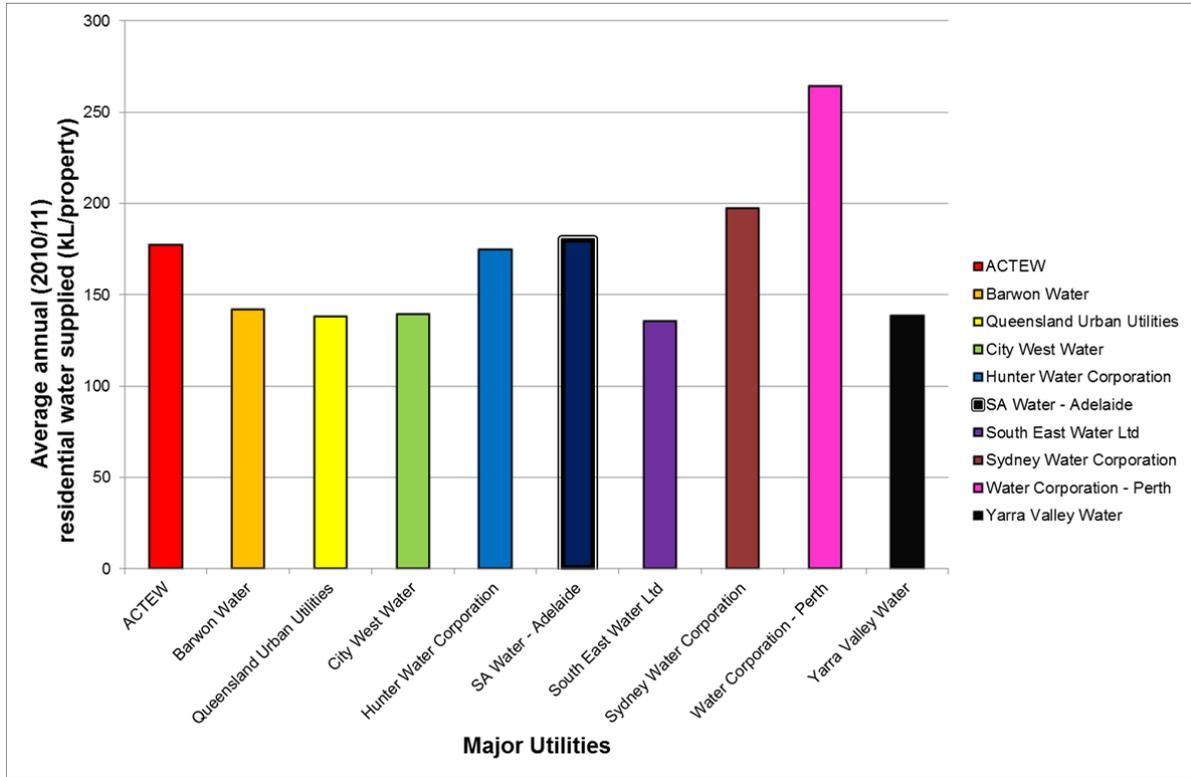


Figure 2-8 Average annual residential water supplied per property in 2010/11

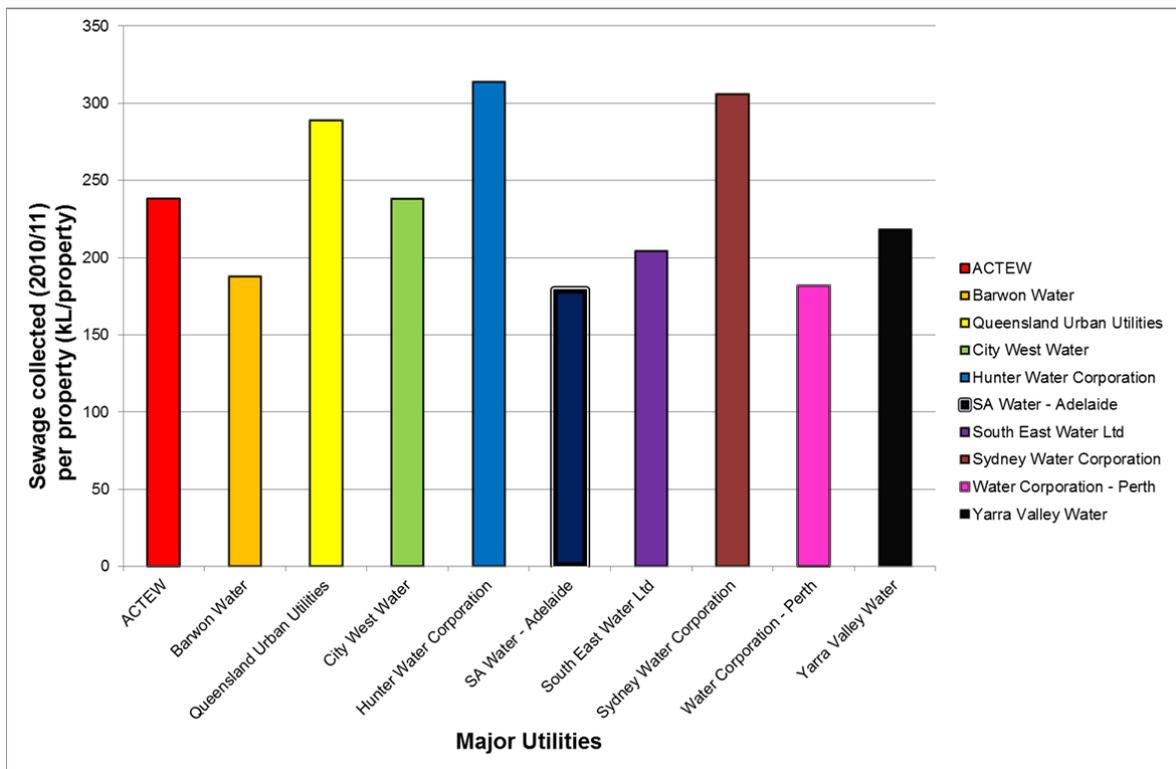


Figure 2-9 Sewage collected per property in 2010/11

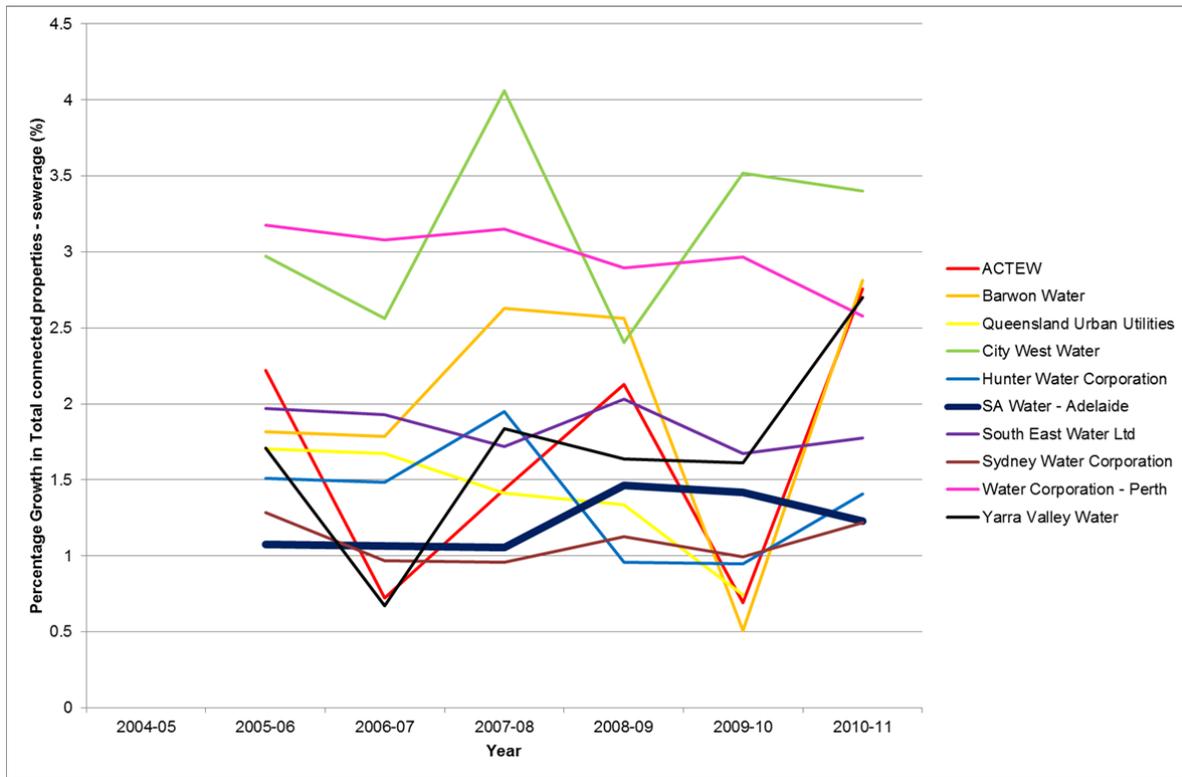


Figure 2-10 Percentage growth in total connected properties – sewerage

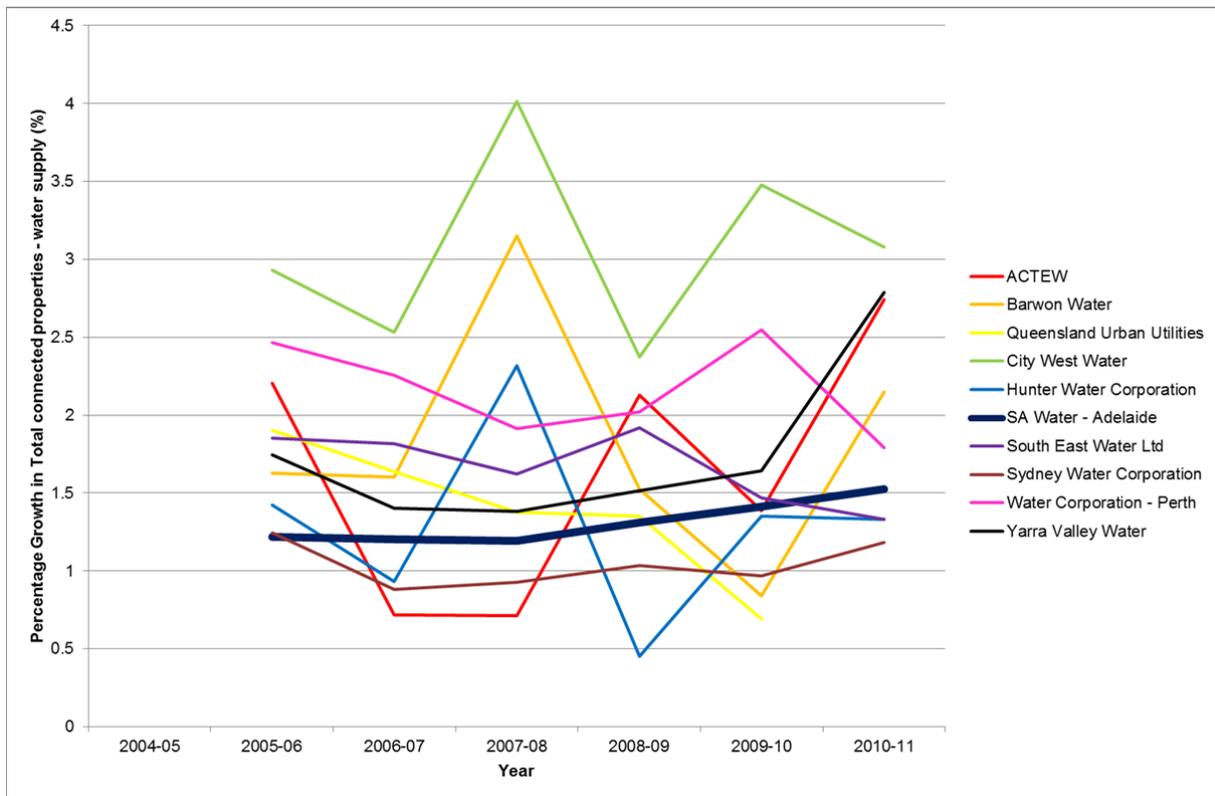


Figure 2-11 Percentage growth in total connected properties – water supply

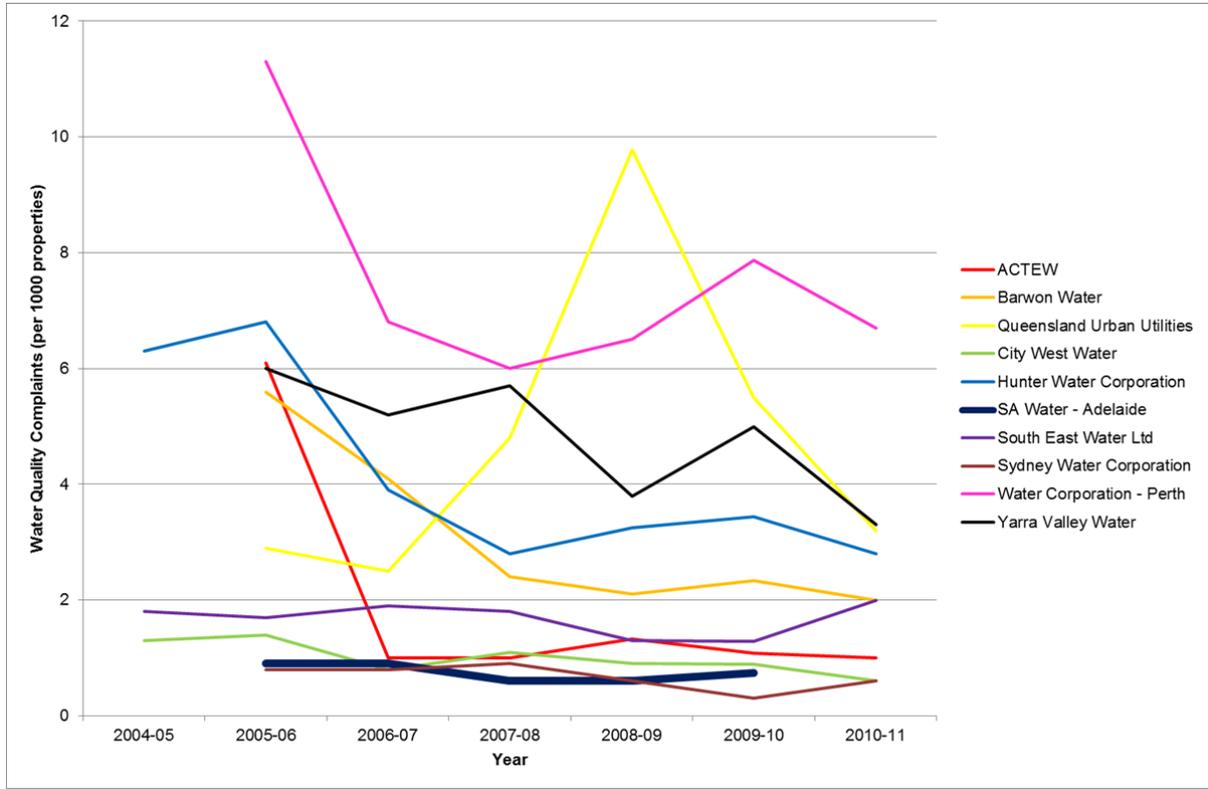


Figure 2-12 Water quality complaints

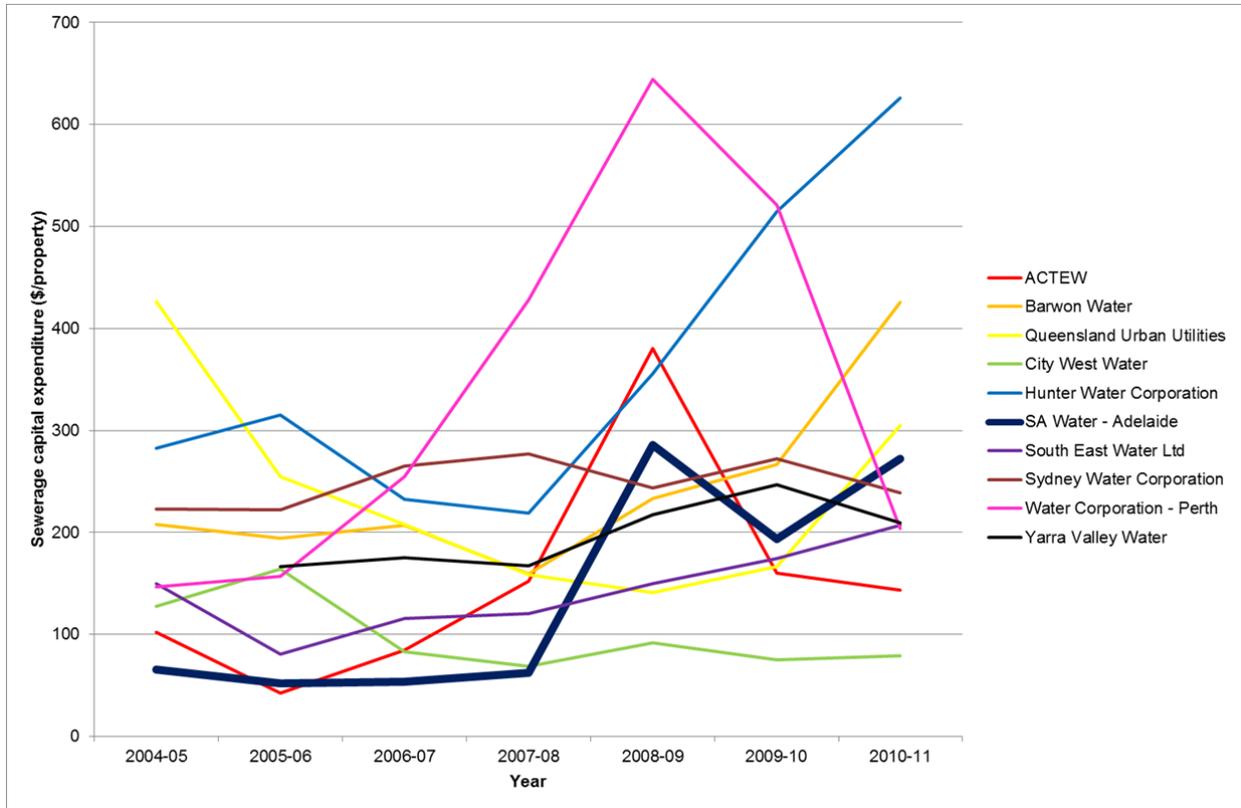


Figure 2-13 Sewerage capital expenditure per property

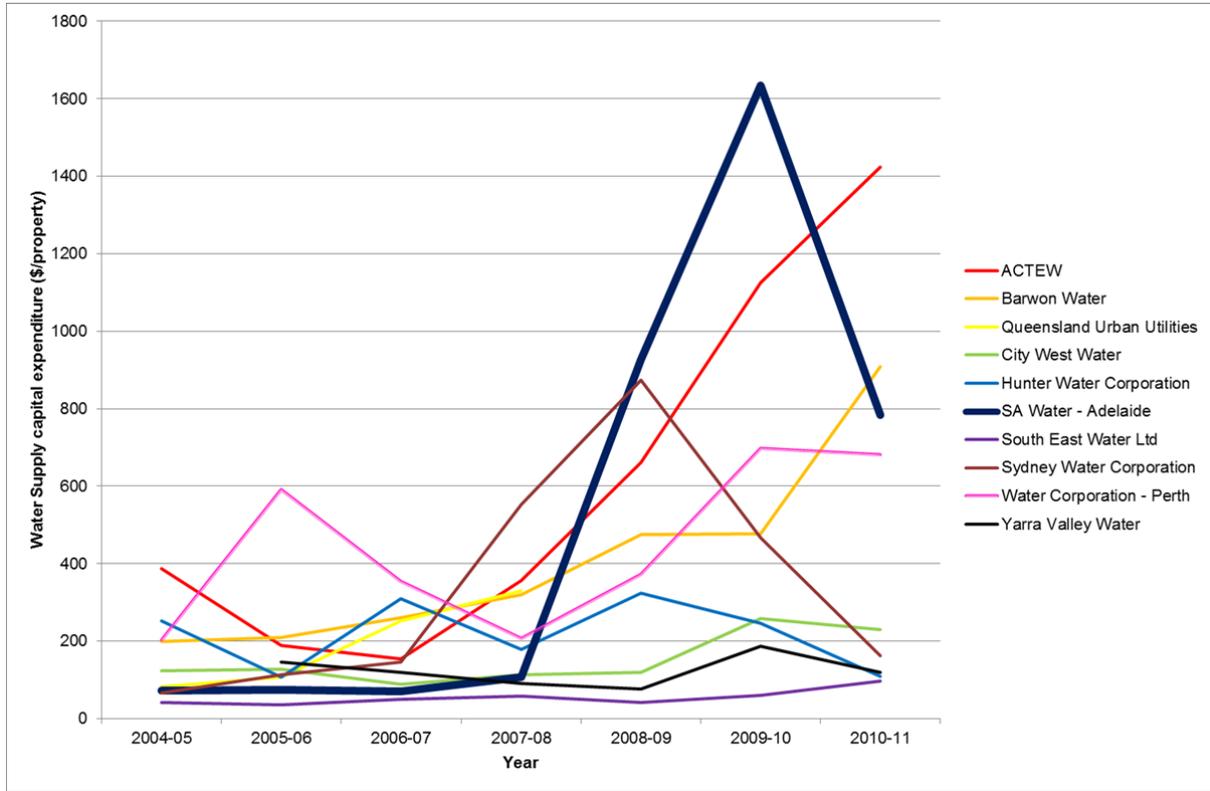


Figure 2-14 Water supply capital expenditure per property

### 3 Governance, budgeting and cost allocation

#### 3.1 Governance arrangements

SA Water in its Proposal summarises the current organisational and governance framework, operating within a legislative and budget setting process prescribed by the South Australian Government. We noted that annual overall budgets are approved at State level within the context of a 20 year financial plan to secure a sustainable financial framework whilst maintaining service standards to comply with the Water Retail Code, environmental and other legislative requirements including health and safety.

Figure 3-1 details SA Water’s governance and reporting structure. SA Water’s board is appointed by the relevant State Government minister and comprises six non-executive directors as well as the Chief Executive Officer. The Board has three standing committees – Audit Committee, Asset Management Committee and the Human Resources Committee

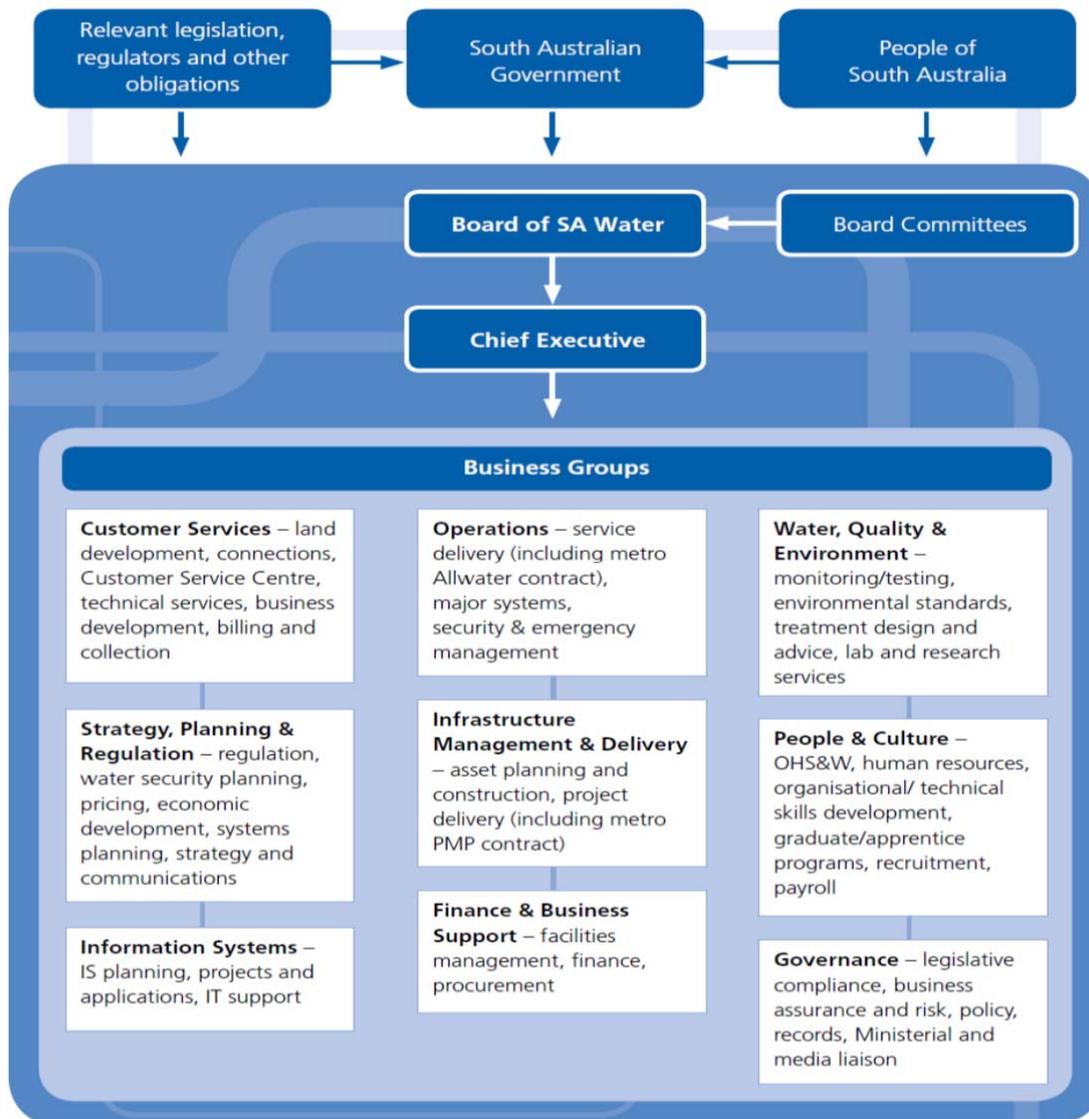


Figure 3-1 Governance and reporting structure<sup>13</sup>

<sup>13</sup> Figure extracted from SA Water Regulatory Business Proposal  
Prepared for Essential Services Commission of South Australia  
Final Report

A key part of the governance framework is the corporate risk register, monitored and reported on a regular basis primarily through the Audit Committee of the Board, particularly in relation to financial reporting, risk management and internal control. We have noted that a Deloitte report recommended that a revised risk management governance model be considered to improve delineations of responsibility and clear communication of the roles and responsibilities in managing the risks SA Water faces. In addition, Deloitte found that the governing bodies (Board, Audit Committee, and Senior Management Team) do not have appropriate transparency and visibility of risk, and risk management practices, to discharge their responsibility in the target maturity state, and recommended that further development of the risk management framework, key policies, and reporting processes, as part of the current review of the framework, was required.

SA Water provides a risk related framework for its Regulatory Proposal through its analysis of key challenges. The understanding of risk and the related mitigation options are a key part of the planning process. Our interpretation is that underpinning SA Water’s proposals for the three year plan period is the assumption that current levels of risk will continue to apply in the future subject to adjustments related to complying with legislative requirements.

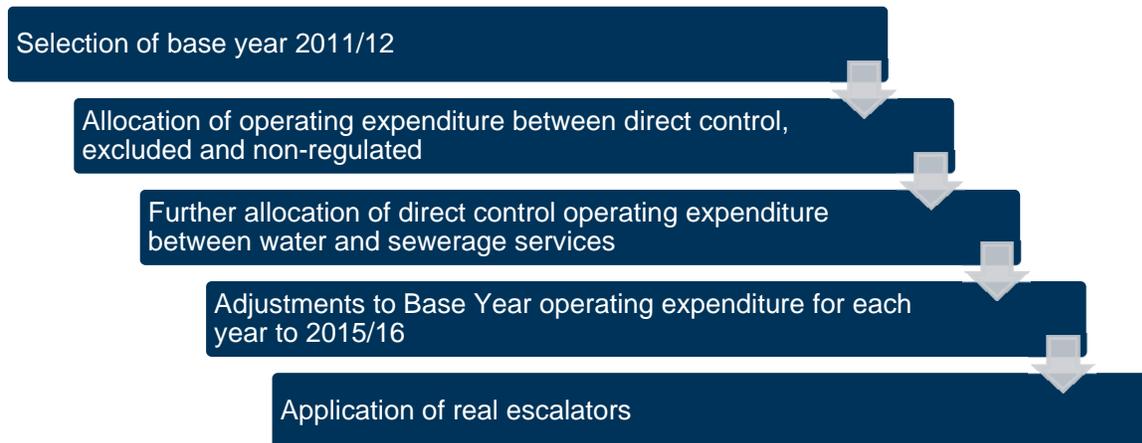
We are not aware if the State Government or the Board has applied high level efficiency targets in the annual budgeting cycle. It is our experience that, in the United Kingdom, it is not uncommon for the Board of a water company in accepting the efficiency challenges of the Regulator, to seek additional efficiencies in the quest for outperformance and the incentives arising. In Australia, the Boards of some water utilities also set efficiency targets for the organisation to achieve.

### 3.2 Budget development

Our understanding is that the annual budgeting cycle reflects a well-established budget on budget approach with a formal quarterly review monitoring progress. There appears to be a mature set of thresholds for approvals for both capital and operating expenditure. Indeed, for a company the size of SA Water, these thresholds may be viewed as relatively low, implying a significant degree of state control on projects and procurement. We comment on this further in the context of capital expenditure in Section 6.4. One of the key issues for a water company with often long lead in times to projects is the short term nature of the budget setting and regulatory processes. The current three year period for which SA Water is submitting its proposal is relatively short; in the UK it is currently five years and in some states in Australia it is four or five years.

### 3.3 Operating expenditure development methodology

The Company’s methodology for developing its operating expenditure forecasts is summarised in Section 7.4 of its Proposal and is depicted in Figure 3-2.



**Figure 3-2 Operating expenditure development methodology**

We comment upon each element of the methodology below. However, it can be viewed as a development of the annual budgeting cycle on the traditional ‘budget on budget’, that is current year budgets are used to build up the next year’s budget. In the context of an initial regulatory submission and the annual budgetary cycle embedded within the Company, this approach is perhaps not surprising.

We have noted that the Company has sought independent review and assurance on a number of key elements of its operating expenditure forecasts, and in the defining of the cost escalators, and future energy costs. We think independent review and assurance is a key part of the governance process in developing the Plan. However, we also note the degree to which the Proposal largely relies on the comfort provided by the consultants’ reports, although we do refer in the sections below to areas of uncertainty and recommendations which the consultant reports highlight.

It is our experience that a budget based bottom-up approach to planning will have a tendency to over-state future requirements in that often the assumption made is that the current year, or in this case the base year, has little or no headroom to accommodate additional costs. In addition, we have not observed in our discussions with SA Water a risk based analysis to forecasting future operating expenditure requirements. Where there are clear reductions in operating expenditure arising from changing obligations, for example in relation to the cessation of drought expenditure, or changing operational requirements arising from the ADP and associated projects, then we recognise that the Company has reflected these in its forecasts.

We have noted that in the Draft Deloitte Report, ‘Risk Management Maturity Assessment’, April 2011, that a high priority recommendation was:

*The risk management processes and procedures need to be consistently embedded across all business units. This includes use of consistent risk assessment processes, risk data collection and collation, risk reporting and inclusion of risk data in business unit strategic planning. These requirements need to be clearly articulated by the Board and the SMT to enable increased transparency and visibility into the organisation’s risk management practices.*

For the purposes of this proposal, the Company appears to have assumed a status quo position, in that additional requirements are viewed as necessitating additional cost, rather than looking at relative priorities and risks in relation to current and future needs. This observation also corresponds to our view noted above that SA Water’s approach to formulating operating expenditure fails to recognise the extent that new obligations will be able to be accommodated within the headroom of existing operations. Similarly, when planning for undertaking new activities, we have found that SA Water has a tendency to consider the costs associated with the new activity only, rather than the likely benefits also. It is our view that SA Water should address these issues in its forward planning for operating expenditure.

### 3.4 Cost allocation

This regulatory review applies only to SA Water’s direct control services. The classification of service areas into each of the three categories is summarised in Table 3-1.

Table 3-1 Regulatory classification of key services provided by SA Water<sup>14</sup>

Direct control services	Excluded services	Non-regulated services
<ul style="list-style-type: none"> <li>▶ Sale and supply of water; and</li> <li>▶ Sale and supply of sewerage services</li> </ul>	<ul style="list-style-type: none"> <li>▶ Standard and non-standard connection services;</li> <li>▶ Miscellaneous minor services;</li> <li>▶ Annual sewerage and recycled water audit services;</li> <li>▶ Easement extinguishment</li> </ul>	<ul style="list-style-type: none"> <li>▶ Laboratory services provided on a commercial basis;</li> <li>▶ Project management services provided on a commercial basis;</li> <li>▶ Water transportation services provided to third parties;</li> <li>▶ Operation and maintenance of</li> </ul>

<sup>14</sup> Sourced from SA Water Regulatory Business Proposal

Direct control services	Excluded services	Non-regulated services
	<p>services;</p> <ul style="list-style-type: none"> <li>▶ Fire plug flow testing services; and</li> <li>▶ Network analysis services</li> </ul>	<p>the River Murray lock system;</p> <ul style="list-style-type: none"> <li>▶ Soil and sand testing services;</li> <li>▶ Emergency functional services; and</li> <li>▶ Metropolitan floodwaters drainage administration</li> </ul>

We are required to comment on the reasonableness of SA Water’s methodology for allocation of costs between direct control services, excluded services and non-regulated services. This methodology is outlined in SA Water’s regulatory submission.

SA Water has commissioned KPMG to undertake a review of its cost allocation methodology. From what we observed in our review, and based on the assurance provided in the KPMG report, we do not believe there are significant issues associated with the way in which costs are allocated between the direct control, excluded and non-regulated service areas.

## 4 Service demand

### 4.1 Service standards

As stated in Section 1.4, SA Water is subject to regulation by a number of agencies, and has been for some time. Some of these agencies have well developed standards, with which SA Water must comply in operating its business. For example, SA Health set standards for drinking water quality, whilst the Environmental Protection Authority sets standards for effluent discharges.

As part of the introduction of economic regulation, service standards are being introduced to SA Water in a staged manner. For an initial time (1 January 2013 to 30 June 2013) prior to the first regulatory period, ESCoSA requires SA Water to use its 'best endeavours' to meet service standards that are in line with, and no worse, than its historical performance.

For the first regulatory period, the service standards applicable to SA Water are set out in the Water Retail Code. This code was published on 16 November 2012 which was after SA Water had prepared its regulatory submission and after our review commenced. SA Water has based its regulatory submission on the draft version of the Water Retail Code and has also been in consultation with ESCoSA regarding the Code for over twelve months.

Therefore, while there was uncertainty over the final detail of the service standards to apply to SA Water, ESCoSA has made it clear that future performance should not be less than existing performance<sup>15</sup>.

For the purposes of our review, service standards are important as they represent a form of 'contract' between SA Water and its customers. It specifies what customers should expect of the business and also what is required to do. Consequently, activities required to meet these service standards will meet the test for prudence as there is a clear need for them to be undertaken. We have based our review on the service standards that are to apply to SA Water from the period from 1 January 2013 to 30 June 2013 in the understanding that the service standards for the first regulatory period are likely to be very similar to these and that the Commission will require that SA Water's use its best endeavours so that its performance is not less than this. These service standards are reproduced in Table 4-1.

Of note, all standards set at 100% have been altered to 99% and some slight wording of a few standards have also changed.

Table 4-1 Service standards to apply to SA Water 1 January 2013 to 30 June 2013<sup>16</sup>

Service Standard	Proposed Target
<b>1. Telephone responsiveness</b>	
Percentage of telephone calls answered within 30 seconds	85%
<b>2. Complaint responsiveness</b>	
Percentage of written complaints that do not require investigation responded to within 10 business days	95%
Percentage of complaints where an investigation is required responded to within 20 business days	95%
<b>3. Drinking water quality complaint responsiveness</b>	
Percentage of Priority 1 complaints responded to within 1 hour (Adelaide metropolitan and regional)	99%
Percentage of Priority 2 complaints attended:	95%

<sup>15</sup> Although by the time of the second regulatory period the Commission has made clear that it anticipates that willingness to pay and other investigations should have taken place that may allow performance to be lessened in trade off for reduced costs.

<sup>16</sup> Sourced from the Economic Regulation of the South Australian Water Industry - Final Advice June 2012 by ESCoSA

Service Standard	Proposed Target
<ul style="list-style-type: none"> <li>▶ within 2 hours (Adelaide metropolitan and regional)</li> </ul>	99%
<ul style="list-style-type: none"> <li>▶ within 12 hours (Adelaide metropolitan and regional)</li> </ul>	99%
Percentage of Priority 3 complaints where further action is required and the customer is contacted within 2 hours to negotiate attendance within 24 hours (Adelaide metropolitan and regional)	99%
<b>4. Timeliness of connection</b>	
Percentage of new standard water connections installed, within 25 business days of application processed and fees received	95%
Percentage of new non-standard water connections installed, within 35 business days of application processed and fees received	95%
Percentage of new standard sewer connections installed, within 30 business days of application processed and fees received	95%
Percentage of new non-standard sewer connections installed, within 50 business days of application processed and fees received	95%
<b>5. Timeliness of processing trade waste applications</b>	
Percentage of trade waste applications processed within 10 business days	99%
<b>6. Timeliness of attendance at water breaks, bursts &amp; leaks</b>	
Percentage of Priority 1 complaints attended within 1 hour:	
<ul style="list-style-type: none"> <li>▶ Adelaide metropolitan</li> </ul>	99%
<ul style="list-style-type: none"> <li>▶ regional</li> </ul>	95%
Percentage of Priority 1 complaints attended within 2 hour:	99%
<ul style="list-style-type: none"> <li>▶ regional</li> </ul>	
Percentage of Priority 2 complaints attended within 5 hours (Adelaide metropolitan and regional)	95%
Percentage of Priority 2 complaints attended within 12 hours (Adelaide metropolitan and regional)	99%
<b>7. Timeliness of water service restoration</b>	
Percentage of Category 1 events restored within 5 hours:	
<ul style="list-style-type: none"> <li>▶ Adelaide metropolitan</li> </ul>	99%
<ul style="list-style-type: none"> <li>▶ regional</li> </ul>	95%
Percentage of Category 1 events restored within 12 hours:	99%
<ul style="list-style-type: none"> <li>▶ regional</li> </ul>	
Percentage of Category 2 events restored within 5 hours:	
<ul style="list-style-type: none"> <li>▶ Adelaide metropolitan</li> </ul>	99%
<ul style="list-style-type: none"> <li>▶ regional</li> </ul>	95%
Percentage of Category 2 events restored within 18 hours:	99%
<ul style="list-style-type: none"> <li>▶ regional</li> </ul>	
Percentage of Category 3 events restored within 12 hours (Adelaide metropolitan and regional)	99%
<b>8. Timeliness of sewerage service restoration</b>	
Percentage of Category 1 events restored within 5 hours (Adelaide metropolitan and regional)	99%
Percentage of Category 2 events restored within 5 hours (Adelaide metropolitan and regional)	95%
Percentage of Category 2 events restored within 18 hours (Adelaide metropolitan and regional)	99%

Service Standard	Proposed Target
Percentage of Category 3 events restored within 12 hours (Adelaide metropolitan and regional)	95%
Percentage of Category 3 events restored within 24 hours (Adelaide metropolitan and regional)	99%
Percentage of partial loss events restored within 18 hours (Adelaide metropolitan and regional)	95%
Percentage of partial loss events restored within 36 hours (Adelaide metropolitan and regional)	99%
<b>9. Timeliness of sewerage overflow attendance</b>	
Percentage of inside building overflows attended within 1 hour (Adelaide metropolitan and regional)	99%
Percentage of outside building overflows attended within 2 hours (Adelaide metropolitan and regional)	99%
Percentage of external overflows attended within 4 hours (Adelaide metropolitan and regional)	99%
<b>10. Timeliness of sewerage overflow clean up</b>	
Percentage of inside building clean ups completed within 4 hours following restoration of service (Adelaide metropolitan and regional)	99%
Percentage of outside building (on property) clean ups completed within 6 hours following restoration of service (Adelaide metropolitan and regional)	95%
Percentage of outside building (on property) clean ups completed within 15 hours following restoration of service (Adelaide metropolitan and regional)	99%
Percentage of external (e.g. road or footpath) clean ups completed within 8 hours following restoration of service (Adelaide metropolitan and regional)	95%
Percentage of external (e.g. road or footpath) clean ups completed within 15 hours following restoration of service (Adelaide metropolitan and regional)	99%

We observe that these service standards are mostly focused on the timeliness of response of SA Water to a service incident. It is our experience that service standards will also include targets relating to the frequency with which service events occur. This creates a focus for the utility to avoid the incident in the first place. We recommend that the Commission consider introducing service standards of this nature in future.

We have benchmarked a number of SA Water's important service standards against the standards (or performance) of three Victorian water businesses. The businesses selected include a large metropolitan business and two smaller businesses including a regional business. Victorian water businesses have been selected as these businesses specify service standard targets that are approved by the Essential Service Commission (of Victoria). The Victorian water businesses' approved service targets and Guaranteed Service Levels are published in the Essential Service Commission's Customer Service Code. Therefore, the applicable standards are publically available and transparent.

The comparison is shown in Table 4-2.

**Table 4-2 Comparison of Sample of Key Performance Indicators Targets**

KPI	Service Provider	2012/13 Target
Customer Contact Services – Answer Rate	SA Water	85% of calls answered within 30 secs in FY
	Yarra Valley Water	86% of calls answered within 30 secs in FY
	Barwon Water	95% of calls answered within 30 secs in FY
	North East	95% of calls answered within 30 secs in FY
Attendance at Burst or Leaking Water Pipes Response metrics for Priority 1 events	SA Water	100% responded to within 1 hour for metropolitan customers
	Yarra Valley Water	Average response of 26 minutes
	Barwon Water	Average response of 35 minutes

KPI	Service Provider	2012/13 Target
Attendance at Burst or Leaking Water Pipes Response metrics for Priority 2 events	North East	Average response of 50 minutes
	SA Water	95% responded to within 5 hours for metropolitan customers
	Yarra Valley Water	Average response of 38 minutes
	Barwon Water	Average response of 68 minutes
Sewerage Overflows to Dwellings Response Time	North East	Average response of 120 minutes
	SA Water	100% responded to within an hour for metropolitan customers
	Yarra Valley Water	Guaranteed Service Level Payment of \$1,000 for not containing an internal sewer spill within an hour
	Barwon Water	Average response time for sewer spills of 80 minutes
Sewerage Service Restoration Time	North East	Average response time for sewer spills of 30 minutes
	SA Water	100% of restored within 5 hours
	Yarra Valley Water	Average restoration time of 249 minutes
	Barwon Water	Average restoration time of 250 minutes
	North East	Average restoration time of 160 minutes

For only one of the service standards considered (response time to sewage overflows within a dwelling) does SA Water have a stricter performance target (or achieved performance) than the comparator agencies. This suggests that the level of service provided by SA Water may in general be lower than that in Victorian water businesses. The Victorian water businesses have been subjected to regulatory oversight for a longer period of time than SA Water.

Given that SA Water is likely to have to maintain its current service standards in the first regulatory period, and that these service standards are somewhat lower than that in comparison water utilities, we believe that there is little justification for expenditure over that already being incurred to meet these service standards. SA Water confirmed that it has not proposed additional expenditure driven by service standards.

## 4.2 Growth and demand

The scope for our review does not require us to assess SA Water's approach to demand forecasting specifically as this is being reviewed by a different consultant. However, we have considered demand forecasting to the extent that growth is the driver for the operating and capital expenditure proposed by SA Water. Demand forecasting has two broadly important functions, firstly, determining likely sales volumes and hence business revenue; and secondly, determining when the capacity of existing infrastructure will be exceeded. It is this second aspect of demand forecasting that we have considered.

SA Water has identified \$243M of capital expenditure in the review period as having a primary driver of growth. This accounts for 22.1% of the total capital expenditure over the three years. Of this total, \$142M, or 58% of the total expenditure is contributed by upgrades to two wastewater treatment plants – Murray Bridge and Aldinga. As will be outlined in Section 8.4, we believe that both these projects should be deferred beyond the regulatory period. Making this adjustment, there remains only \$101M of capital expenditure in the regulatory period relating to growth. This amounts to around only 10% of all expenditure and demonstrates that growth is not a large driver of expenditure for SA Water at this time.

With the construction of the Adelaide Desalination Plant, no water supply augmentation is proposed in the regulatory period. Excluding the expenditure on the Murray Bridge and Aldinga treatment plants, there

remains only \$24M of expenditure on wastewater treatment plant augmentation. The largest component of growth driven expenditure is for networks which totals just over \$77M in the three years.

SA Water has an ongoing program to complete and update "Long Term Plans" for water security in each of its operating regions. It has recently completed a Long Term Plan for the Eyre Region. As part of Plan development, SA Water obtains relevant information on future growth in population and industry from sources including local councils, the Australian Bureau of Statistics and the State Government. A hydraulic model is constructed as part of planning process. SA Water tests different growth scenarios (low, medium, high) to determine likely future infrastructure requirements.

For the Adelaide metropolitan region, demand planning is undertaken on an ongoing basis as needs are identified. SA Water maintains a network of pressure loggers and flow meters in the Adelaide network which provide data for use in modelling.

The State Government influences the pattern of development in that it has a target of meeting 70% of future growth through infill development. The State Government also has policies to promote development in regional centres such as Mt Barker and Murray Bridge which SA Water is required to respond to. A shortcoming in the land development process in South Australia is that land release is not as coordinated as in other jurisdictions. This is very likely to lead to sub-optimal provision of infrastructure to new developments as SA Water and other service providers are unable to provide new infrastructure coordinated and staged to the extent possible compared to if land releases were more controlled. As this is likely to be a source of inefficient costs to customers, we recommend that this issue be reviewed by ESCoSA where possible.

We believe that the demand planning undertaken by SA Water is satisfactory for its purposes.

## 5 Strategic asset management

### 5.1 Asset management framework

In August 2012, SA Water prepared a “High Level Asset Management system” document to replace previous related documents. This document was reviewed by the Manager Asset Management and the Manager Regulation and considers the Corporate Perspective, the Asset Management System Architecture and Asset Management Documentation. At a more detailed level, it considers Asset Management Policy; Asset Management Strategy, Planning and Decision Making; Assets Lifecycle Delivery; Risk & Review; Asset Information; People, Skills & Processes. This is in line with an organisation seeking accreditation with the Publicly Available Standard on Asset Management (PAS 55) or alignment with the coming International Standards for Asset Management, ISO 55000.

SA Water has management in responsible positions that are aware of the importance of asset management to the organisation and the elements that need to be in place. While the company purports in its asset management planning activity to cover a 25-year horizon with a higher degree of detail and certainty in the early years, the historical position of the company has been significantly influenced by the one year budgetary timeframe when it was a state-run rather than state-owned entity. This has led to the planning of renewal and refurbishment work being on the basis of the focus of effort being on the resolution of existing, known, larger problems, together with unknown but predictable smaller problems, dealt with by budgetary allowance, in line with previous expenditure.

The allocation of expenditure to renewal and refurbishment on this basis is not necessarily going to be wrong. However, there must be doubts whether the budgetary process would be repeatable and would yield the same results if different people were managing it. From our meetings with asset management managers from SA Water, we concluded that the key staff were competent, and this perception was reinforced by the acknowledgement that all of the ingredients for best practice asset management were not yet in place, and that a significant data gathering exercise had already commenced, and was included in the future capital and operating cost projections.

While we believe there is scope for improvement, SA Water has clearly been aware of developments in asset management and is considerably ahead of where we have seen other water utilities so soon after evolving from council or government bodies. There seems to be a good understanding of the need to develop documented asset management processes and procedures, needs cases, optioneering and risk management.

With a maturing asset stock and the rate of growth being small compared to the existing asset base, SA Water can now be described as an asset management organisation. The effectiveness of the company will be judged on its ability to efficiently allocate resources while maintaining an acceptable service to its customers. The company has integrated its asset management activity with other business planning functions.

Asset Management functions are carried out by the Asset Management Business Unit, which is part of the Infrastructure Management & Delivery Group. The head of the Infrastructure Management & Delivery Group reports directly to the Chief Executive. The organisational set up of SA Water is typical of PAS55 type structures we have seen elsewhere in Australia, the Middle East and in the UK water industry. However, we note that the structure and acknowledgement of PAS55 do not themselves guarantee that efficient and effective asset management is taking place. Indeed, the only UK water company in the PR09 Price Review by Ofwat to have PAS55 accreditation was adjudged to have the worst asset management systems in support of its business plan, and it was heavily financially penalised as a result. The real test of the asset management capabilities of SA Water will be how it makes use of the improvements in process and data collation over the coming regulatory period.

An area where we have some concerns is that there appears to be only rudimentary linkage between the management of the assets and the perceptions of the customer. A particular area where this is apparent is on the matter of water quality. We note from CS032 – Customer Satisfaction Research 2012 (pages 9-10) that:

*“The incidence among households of encountering any problems in the last twelve months in relation to their mains water supply was as follows:*

- ▶ Changes in mains water pressures (yes – 18%, up from 14% in 2011; no – 82%, down from 85% in 2011)
- ▶ Water pressure too low (yes – 17%, up from 14% in 2011; no – 82%, down from 86% in 2011)
- ▶ Discoloured or dirty looking water (yes – 14%, up from 12% in 2011; no – 85%, down from 88% in 2011)
- ▶ Any unusual odour (yes – 14%, unchanged from 2011; no – 86%, up slightly from 85% in 2011)
- ▶ Cloudy water (yes – 13%, down from 15% in 2011; no – 86%, up slightly from 85% in 2011)
- ▶ Any unusual or unpleasant taste of the water (yes – 12%, down slightly from 13% in 2011; no – 79%, down slightly from 80% in 2011)
- ▶ Interruption to supply with water not coming out of the taps (yes – 8%, unchanged from 2011; no – 92%, unchanged from 2011)
- ▶ Water pressure too high (yes – 4%, unchanged from 2011; no – 96%, unchanged from 2011)”

This would indicate that a significant proportion of SA Water customers believe that they have received unsatisfactory water quality in the last year, although from the data above, it is impossible to infer an overall level of dissatisfaction as single respondents may be included in more than one problem area. We also note that 77% of the respondents to the 2012 customer satisfaction research were aged 50+. Intuitively you would expect that this older age bracket would have got used to poor water quality and that the real situation might be even worse than the figures indicate.

In section 3.3.1 of its Regulatory Business Proposal, SA Water indicates that it “is committed to provide drinking water it knows is safe and complies with relevant quality standards”. It goes on to refer to its internationally recognised excellence in water quality management as reflected in the dramatic decrease in complaints since the 1990s. The customer satisfaction survey indicates less favourable (by a factor of over 100) water quality data than might be inferred from the under 0.015% complaint level in metropolitan Adelaide for the past 10 years.

We note that in terms of customer complaints, SA Water performs very well when compared with other utilities in Australia (see Section 2.5). We know from experience elsewhere that the level of complaints can give false low indications of customer dissatisfaction due to customers becoming resigned to and accepting of a poor service. We note that the importance of customer perception is at the heart of the development of the PR14 business plans in England and Wales. Indeed there is a formal regulatory requirement to establish a Customer Challenge Group to represent the full customer base and the many stakeholders, and Ofwat has made it clear from the onset that it will not be receptive to any business plans that cannot demonstrate the challenge from and support of the Customer Challenge Groups. Further to our discussion in Section 4.1 on service standards, we see this as an area where SA Water can improve over the forthcoming regulatory periods.

## 5.2 Risk management

SA Water has put much effort into risk management at a company and individual project level. As this approach has been relatively recently adopted, we believe that a simple traffic light approach with a matrix of likelihood and consequence is appropriate. There is not the breadth and depth of information available to take a more sophisticated probabilistic or monetarised approach.

The asset management planning has not yet evolved to a FMECA (failure modes effects and criticality analysis). This will become more possible with the improvements to data gathering and analysis proposed.

We believe that SA Water is on the whole risk averse despite some evidence that it has undertaken expenditure to address identified risks at a slower rate than we would have expected to see at other organisations. This is the understandably preferred position of most water companies, especially where there is uncertainty about the condition and performance of the asset stock. However, we believe that with a shift towards being a more customer focused organisation, there will be greater emphasis on the 'willingness to pay' of the customers and the real impact of asset failures needs to be fully understood and balanced with the impact on bills.

The company has well developed governance in place, with an Audit Committee that has been delegated responsibility for the Risk Management Policy and Framework, which formally establishes the process of assessing the business risks and opportunities, as well as developing and implementing strategies to transfer, manage and/or mitigate risks. The policy is consistent with ISO 31000.

We were told that SA Water's risk management framework is compliant with SA Government directions in risk management and involves review of every capital expenditure program and the individual projects and project portfolios within each program.

### 5.3 Asset Information Systems

The biggest and potentially most important existing source of above ground asset information in terms of condition and performance, is the knowledge of the asset managers and operators. This should not be undervalued. While there will always need to be checks and processes in place to prevent the fulfilment of profligate "wish lists", this rich vein of information should be used to ensure that evidence based asset information is calibrated against reality and used in context.

An approach widely used in the UK water industry during the 1990s to determine the scale of capital investment requirements against the prevalent backdrop of sparse or unreliable data, was the use of Bayesian models. These models used what data there was available together with the informed opinions of operations and asset management staff to create a model which was "improved" as better information became available. Although the margin of error at a component level was relatively high, the aggregated and compounded uncertainty at program level was more acceptable. This approach was useful as an indicator of the scale of capital programs needed, but fell out of favour as the economic regulators required increasing levels of detail on the elements of programs rather than just the scale. It may be prudent for SA Water to adopt some form of combined qualitative and quantitative approach to asset management planning until a more complete dataset is available.

Ofwat recognised the need to spend money on data gathering and analysis in the early years after privatisation, but expected this data to be available and used as time went by. This greater regulatory imperative was also driven by the "unexpected" high levels of efficiency (and thereby profit in the privatised water industry model) that was achieved by companies deferring spend after reassessing the balance of risk between customer and company. The further stages of this evolution of the UK water industry approach to asset management was the "arbitrary" slashing of budget proposals by the regulator followed by the evolution of an agreed (between companies and regulators) method of tackling the development of asset management plans which was used as the basis of assessing the validity of the plans.

We believe that the scale of increase in expenditure in asset renewal cannot be justified at this stage. There are certainly indications that there has previously been under investment in asset replacement, but a step increase in expenditure brings with it concerns about the mobilisation of design and construction, as well as the ability to appropriately target expenditure at a much higher level at such short notice.

For above ground assets there are known problems to be resolved and it is possible to target specific remedial work, but the level of knowledge on performance and condition is variable across the asset base.

For the underground assets, there is greater knowledge of the condition and performance of the assets in terms of mains (break dates and location) and sewers (blockages and collapses dates and locations). If used with the GIS and job management systems, the data is there to understand the performance of the assets, its impact on customers and to justify (or otherwise) the promotion of mains renewal schemes.

There are now systems in place which are used to automate asset management activities and provide consistent decision support analysis. SA Water has three main asset registers for infrastructure assets. Two are used for operational, planning and strategic purposes; they are the geographic information system (GIS) and Maximo 7. The third is used for financial asset valuation purposes and is the corporate Fixed Assets Register (FAR). The key asset information systems within SA Water are summarised in Table 5-1.

**Table 5-1 SA Water's asset information system**

System	Functionality
Corporate Geographic Information System (GIS)	<ul style="list-style-type: none"> <li>▶ Spatial information repository for use in asset management, operations and customer enquiries</li> <li>▶ Supports a number of core applications, upstream and downstream applications including: AquaMAP (based on the ESRI eView product) and MaximoMAP (the GIS component of Maximo)</li> </ul>
Maximo	<ul style="list-style-type: none"> <li>▶ Manage the maintenance and operation of SA Water's network assets</li> <li>▶ Data store for non-pipe assets such as treatment plants and headworks (pipe assets and minor fittings are stored in the GIS)</li> <li>▶ Provides information needed to (i) generate long and short-term asset plans; (ii) plan and schedule preventive, reactive and condition-based maintenance; (iii) optimise resource utilisation; (iv) measure key customer and operational charter performance indicators.</li> </ul>
Fixed Asset Register (FAR)	<ul style="list-style-type: none"> <li>▶ Performs the valuation and depreciation calculations for all assets except major plant, minor plant and the following major infrastructure asset groups (i.e. Major Dams, Wastewater Treatment Plants, Water Treatment Plants)</li> </ul>
Customer Services Information System (CSIS)	<ul style="list-style-type: none"> <li>▶ Manages the billing for water and wastewater products and services</li> <li>▶ Supports core business functions (i.e. Customers and Property Maintenance, Meters, Customer Applications, Billing, Receipting, Recovery, Financial Controls, Conveyancing and Adjustments, Pending Work Queue (PWQ), Audit Controls and Reports)</li> </ul>

*Source: SA Water Regulatory Business Proposal*

Maximo 7 has recently been introduced to regional operations and to the Allwater contractor for metropolitan areas. As part of this rollout new asset hierarchies and failure codes have been introduced that have been designed to provide better information to the asset management team.

## 5.4 Conclusions

With the possible exception of the ADP, there is no real indication that assets are underutilised or potentially "stranded". The ADP was built as a response to a drought, which we have been told was a 1 in 150 year event. The drought came to an end and SA Water and its customers survived a time of system stress without (before) the ADP being available.

While we understand the political expedience of constructing large desalination plants in all of the state capitals, the economic merits of doing so may be less straight forward. That being said, the ADP may lend itself to the implementation of an asset management planning approach which responds to the customer survey information that is available.

The water from the ADP (particularly over the commissioning period) will reduce the criticality of some of the water treatment and pumping assets, thereby making it possible to take them out of service for refurbishment

or upgrade without the additional cost that is often associated with maintaining operability of critical plant to provide continuity of supply.

There may also be scope to improve the aesthetic quality of the water supplied through blending and/or the improved treatment of Murray River water. The utilisation of the ADP goes beyond the scope of the current review, but should be part of any coherent strategy going forward.

SA Water has the systems and people in place to carry out asset management in line with industry best practice. However, we believe that the maturity of the asset management function is such that it cannot yet be inferred that fully effective asset management is taking place. Much data is still to be gathered. The availability of the broader dataset will allow greater focus in expenditure allocation. We do not believe that SA Water can justify significant increases in asset management and particular asset maintenance expenditure at this time. However, we do accept that there needs to be an increase in the effort, and therefore cost, of gathering information from which future asset management decisions can be based.

## 6 Capital planning processes

### 6.1 Investment identification, appraisal and development

SA Water has in place a 'Project Management and Procurement' (PMP) contract for its metropolitan operating area. This contract is an alliance with engineering consultants KBR and includes in its scope project management, procurement and construction management services for capital projects with value between \$0.5M and \$11M. For projects of value greater than \$11M, SA Water may use this contract or may go to open market.

Expenditure identification and initial planning is not undertaken in the PMP contract, this is an SA Water responsibility. SA Water develops a project brief which is then passed over to the PMP alliance to develop and take through to completion. SA Water maintains a governance role throughout the development of capital project and, as a partner in the alliance, also contributes to project delivery.

The project briefs that are passed on to the PMP alliances are authored by SA Water's Asset Management team. The Asset Management team identifies needs from sources including asset management plans, condition and performance monitoring, understanding of changed obligations and demand planning. Asset Management for SA Water's metropolitan assets was previously a function under the now ceased O&M contract with United Water. SA Water found that this asset management function was not undertaken to its satisfaction by United Water. Consequently, it has brought the asset management function back in-house. We believe that SA Water has the potential to realise efficiencies through now being better able to understand its assets and the need for replacement and renewal of them. SA Water took back this asset management function for metropolitan assets on 1 July 2011.

SA Water informed us that the information in project briefs is obtained from numerous sources as it builds a picture of the need that has been identified. SA Water recognises that the depth of information in its asset management information system, Maximo, needs to be improved and is working in this area. Specifically, Maximo needs to be the single source of information to the business on asset attributes, criticality, condition and performance. We believe that SA Water will gain efficiencies in its capital expenditure through improving Maximo, as it will be able to undertake more quickly and more fully appraisal of needs identified for further investigation.

We believe that SA Water's processes for identifying and developing capital projects is sound, noting that the initial stages of the process which are undertaken by SA Water's asset management team are still maturing. The PMP alliance for capital delivery appears to be bedded down. We have identified that SA Water may gain efficiencies through:

- ▶ It's taking back of the asset management functions for metropolitan assets which will allow it to better understand its assets and their need for renewal and replacement.
- ▶ Improving the depth of asset information held in Maximo, to allow it undertake more quickly, and more fully, appraisal of needs identified for further investigation.

### 6.2 Cost estimating

SA Water uses a number of different approaches to estimate costs for its capital projects. These approaches include:

- ▶ Contract rates for mains renewal and rehabilitation activities.
- ▶ Historical costs for programs of work.
- ▶ External cost estimators for large projects.

SA Water has a formal cost estimating guideline that establishes the terminology and processes to be consistently applied in developing cost estimates.

We found in our review of a sample of capital expenditure projects (Section 8.4) that, for regular work activities, SA Water has good understanding and control over capital costs. However, we found that for larger one-off projects, and in particular where external cost estimators had been used, that the treatment of project costs, and the unit rates used, was less consistent.

We believe that this inconsistency is in part attributable to the fact that SA Water does not maintain capital cost databases across its whole range of work activities. Historical costs are only kept for ongoing programs of work. We believe that maintaining comprehensive internal cost databases will enable SA Water to identify scope for cost reductions through setting of realistic cost estimates early in the approval process that will drive alternative solutions or alternative procurement/delivery mechanisms.

We also found in our review of capital expenditure projects that project cost contingencies were treated inconsistently between projects. The cost estimating guideline only suggests that the contingencies applied should be variable 'dependant on (the) level of information' available. We also found that, generally, contingencies did not reduce in magnitude as projects became more developed. We believe that SA Water can gain efficiencies in its capital expenditure through a more rigorous treatment of cost contingencies. Contingencies should be monitored at a program level. We recommend that SA Water investigate quantifying and managing cost contingencies on a risk basis and include more detailed guidance on this area in its cost estimating guideline.

### 6.3 Capital expenditure prioritisation

SA Water has refined its capital expenditure program in the submission development process, reducing the planned level of expenditure from an initial annual total of between \$600M to \$750M to the submitted program which averages less than \$400M per year across the review period. The scaling back of the capital expenditure program was undertaken based on the uncontrolled risk associated with each project associated with deferring all or part of the proposed works. The risk assessment and prioritisation included the following:

- ▶ Calculation of uncontrolled risk for each project based on the likelihood and consequence associated with the most likely hazard from deferring all or part of the project. The calculation of risk was in line with SA Water's corporate risk framework which is based on ISO 31000. This was achieved through a workshop of technical staff. All expenditure items except those with Full Financial Approval (FFA) were reviewed.
- ▶ Banding of projects into four categories based on risk level at the same workshop. SA Water uses a numerical scale to score risk from 1 (Rare x Insignificant) to 25 (Almost Certain x Catastrophic).
- ▶ Review of the risk assessment and banding by senior management.
- ▶ Review of the risk assessment and banding by a sub-committee of the Board.
- ▶ Adoption of a risk score of >9 as the cut off for acceptance of risk. This equates to the unlikely occurrence of a major consequence.
- ▶ Approval by the Board of the prioritised capital works program.

The exceptions to the above process were expenditure related to Information Services, which went through a separate prioritisation; and expenditure to address health and safety risks. The Board required all expenditure relating to health and safety which scored a likelihood rating above 'unlikely' to be approved.

We believe that this risk prioritisation process is sound. The following features are positive elements of the process:

- ▶ Alignment with corporate risk framework.
- ▶ Risk assessment based on a reasonable 'proposition' that may be deferral of all or part of the project. This allows greater definition in the risk assessment compared to processes that only allow for 'all or nothing'.

- ▶ Transparency of risk scoring (SA Water has provided schedules of the consequence area, likelihood, consequence and risk score for each item).
- ▶ Workshop process for risk scoring allowing input from a range of technical areas.
- ▶ Involvement in the Board through its sub-committee in the prioritisation process to allow them to shape the process. This is important, as it provides greater awareness to the board of the costs and benefits of the capital works program, prior to them being asked to approve the program.
- ▶ Articulation of risk appetite that is able to be related to the likelihood and consequence of an unacceptable event, as well as the specific directive relating to health and safety expenditure.

While we commend SA Water on the above aspects of the prioritisation undertaken, we believe that the fact that initial capital expenditure program development was significantly larger than that proposed demonstrates that the mitigation of risk associated with undertaking capital works is not sufficiently considered in the earlier stages capital planning process. This is likely due to risk assessment for prioritisation not yet being part of business as usual for the organisation. We recommend that SA Water revise its capital planning processes so that the risk addressed by the expenditure is considered as early as possible. This will assist in screening proposed projects so that attention may be focused on those that address the highest business risks. We recommend that SA Water establish a criticality rating for its assets (by asset class or by individual asset depending on the circumstances) to assist with this initiative.

In addition to the whole of program prioritisation described above, SA Water undertakes prioritisation within its program of works. For example, we reviewed programs related to health and safety (pump station access, chlorine storage and tank access) where SA Water had identified the risks it needs to address across its asset portfolio and then embarked on a staged program of works over 5-10 years to address them. Works within the program were prioritised on risk factors specific to the nature of the risk. This approach has led the organisation to accept the risk of an incident while the improvement and rectification works were taking place. We believe that in some instances, SA Water would have been justified to progress the expenditure at a faster rate. The fact that SA Water chose to adopt a more conservative rectification program is very likely to have led to a lower total cost across the period of the program, i.e. a more efficient outcome.

SA Water states in its submission that it has completed portfolio optimisation for capital expenditure related to information services. However, we saw limited evidence that optimisation of expenditure across the whole program of works has taken place at this time. For example, we believe that the opportunities presented by the Adelaide Desalination Plant being operational for two years for proving purposes had not been fully identified. These opportunities may include, for example, undertaking major maintenance on water supply assets that will have reduced operation when desalinated water is available. We believe that there is potential for SA Water to gain efficiencies over time by taking a higher level, portfolio approach across its capital works program. This may identify opportunities to achieve the outcomes desired from the capital works program at a lower cost. We appreciate that SA Water is already moving in this direction.

## 6.4 Capital expenditure governance and procurement

SA Water has very well developed processes for approval of capital expenditure through the project lifecycle. These are set out in its Corporate Project Management Methodology (CPMM). The processes apply to both capital expenditure projects progressed through the PMP alliance and those progressed internally by SA Water. The majority of capital expenditure in the metropolitan area is delivered through the PMP alliance. As noted previously, the PMP alliance contract covers procurement and construction management services for capital projects with value between \$0.5M and \$11M. Projects with value of less than \$0.5M in the metropolitan area are typically delivered by SA Water's metropolitan operations and maintenance contractor (Allwater). Projects with value greater than \$11M are delivered either by the PMP alliance or SA Water, following an evaluation process to determine the most appropriate route.

A high level process map for the CPMM is shown in Figure 6-1. The methodology has four phases: Initiate, Develop, Deliver and Close. The red boxes indicate approval and endorsement steps. This function is undertaken by SA Water. Non-financial approvals are typically undertaken by the SA Water project sponsor

who is generally from the Asset Management team. We note that there are twelve approval/endorsement steps in total, which is more than for similar organisations. Streamlining these approval steps may deliver efficiencies by requiring less time input from the Asset Management Team.

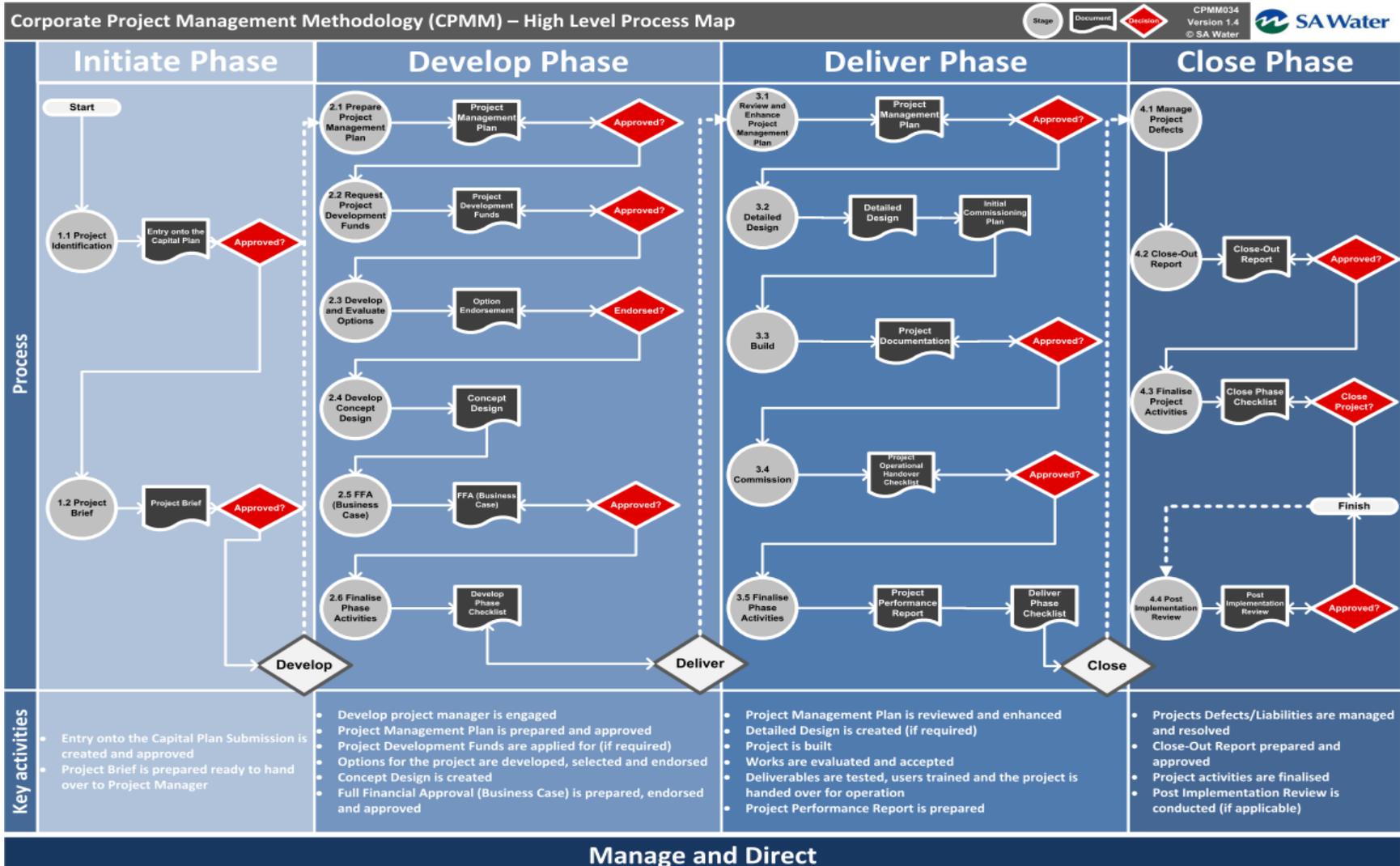


Figure 6-1 SA Water's Corporate Project Management Methodology

Financial approval occurs at four stages as outlined in SA Water’s Capital Expenditure Approval Procedure (CG 037). These are:

1. Entry onto the capital plan.
2. Project Development Funds.
3. Option Endorsement.
4. Full Financial Approval.

Approval of finances at each stage provides the funding to move to the next stage. Approval of finances is undertaken in accordance with SA Water’s *Delegations of Financial and Procurement Authority Policy* and *Delegations of Financial and Procurement Authority Register*. As a State owned corporation, SA Water must follow the delegation levels set by the State Government<sup>17</sup>. This occurs at the FFA stage. These authority levels are shown in Table 6-1.

**Table 6-1 South Australia State Government delegation of authority levels**

Purchase or contract consideration	To be approved by
<\$1.1M	<ul style="list-style-type: none"> <li>▶ Cabinet, or</li> <li>▶ the Minister, or</li> <li>▶ the Chief Executive or governing authority, or</li> <li>▶ an employee nominated by the Chief Executive Office or governing authority</li> <li>▶ or an employee nominated by an authorised employee</li> </ul>
\$1.1M to \$11M	<ul style="list-style-type: none"> <li>▶ Cabinet, or</li> <li>▶ the Minister, or</li> <li>▶ an employee nominated by the Minister in writing</li> </ul>
>\$11M	▶ Cabinet

In addition to the above authority levels set by the State, SA Water’s Board has delegation to approve projects of value up to \$4M. Under these authorities and delegations, the State Government can be involved in approving any project with value greater than \$1.1M. This equates to 0.1% of SA Water’s forward capital program. In addition to the above, projects may be referred to a cross-party Public Works Committee of the State Government for review.

We believe that this framework for expenditure delegation restricts the ability of SA Water to act on a commercial basis, as it is required to do under the *Public Corporations Act 1993*. This occurs in two ways. Firstly, we observe that commercial organisations do not have this level of shareholder involvement in its expenditure plans. This impedes the ability of the executive and Board to make independent business decisions. Secondly, the effort required by SA Water to prepare submissions to the Government creates costs and time delays that other commercial organisations do not face. We also note that the authorisation levels are generally lower than that for other public sector organisations across Australia.

We are also concerned that authorisation occurs at FFA stage in project development. As shown in Figure 6-1, this occurs after concept design is complete but before detailed design is commenced. It is our experience that project costs can change significantly as detailed design is progressed, through better

<sup>17</sup> Treasurer’s Instruction 8, Financial Authorisation. Department of Treasury and Finance. Reissued: 28 March 2012 Effective: 14 January 2011. Available at: [http://www.treasury.sa.gov.au/df/financial\\_management/financial\\_and\\_economic\\_documents/treasurers\\_instructions.jsp](http://www.treasury.sa.gov.au/df/financial_management/financial_and_economic_documents/treasurers_instructions.jsp)

information regarding ground conditions, environmental approvals, etc. Under the State Government procurement approval process, any changes to the expenditure previously authorised requires the variance to be approved by the original approval body. That is, if a project was originally approved by Cabinet, any extra funding required over the approval amount must then also be approved by Cabinet, regardless of the amount by which the variance exceeds the original approval.

We note that in its *Review of Project Delivery* report submitted with its regulatory submission that SA Water notes that its expenditure on its largest 20 projects over the period 2006/07 to 2011/12 period was within 2% of the approved estimates. We consider that while it is possible that this demonstrates that SA Water is very good at estimating project costs, it is more likely, when considered with the above observations, that requirement on SA Water to gain approval for whole of project funding at the concept design stage leads to the organisation putting forward cost estimates that are sufficiently conservative to not be exceeded. This initial cost estimate, which is not based on complete information, may then become self-fulfilling.

Further, we note that the requirement on SA Water to gain State Government approval for many of its projects then leads to SA Water's cost estimate being in the public domain. This occurs for example when the Public Works Committee publishes its reports on the capital expenditure proposed by SA Water which include the FFA estimate. These can be readily found online at this location:

<http://www.parliament.sa.gov.au/Committees/Pages/Committees.aspx?CTId=5&CId=177>.

We believe that publishing these FFA cost estimates is likely to restrict the competitiveness of the prices obtained by SA Water when it goes to open market as the market has already been informed of SA Water's own estimate of the cost. We believe that this is a violation of the 'Key Procurement Principles' set out in the State Government's 'Procurement Policy Framework'. In particular the requirement under the principle relating to 'Probity, Accountability and Transparency' that the 'confidentiality of all commercial information' be ensured. The initial cost estimate completed by SA Water is commercial information that is not being kept confidential under the current process.

We recognise that SA Water has limited ability to change the expenditure authorisation framework required of it by the State Government. However, we believe that significant benefits may be obtained by the organisation by challenging the State Government to reconsider this framework and make the following changes (in order of importance assessed by us):

- ▶ Complete confidentiality of capital cost estimates when referred to the State Government for approval.
- ▶ Referral for FFA after detailed design. This will remove any potential for estimates at concept design to be overestimated to allow for risks yet to be identified.
- ▶ Transferring more responsibility for capital expenditure approval from the State Government to SA Water executive and Board through a streamlined process and higher levels of delegation.

SA Water employs numerous procurement practices for capital expenditure as described in its regulatory submission. This includes its O&M contractor for minor works in the metropolitan area, panels and open tenders. We believe that SA Water's procurement practices are sound, noting the limitations imposed by the governance framework it operates in as discussed above.

## 6.5 Conclusions

We found that while SA Water has well developed processes for capital development and delivery, and particularly for governance of capital expenditure, opportunity exists to improve the rigour with which SA Water identifies and tests needs early in the capital planning process. This may be addressed in part by improving the coverage of data held in Maximo. We also believe that there are opportunities to improve SA Water's cost estimating processes and to make capital prioritisation /screening part of business as usual practices.

We believe that the following opportunities exist for SA Water to gain efficiencies in its capital planning processes:

- ▶ The taking back of the asset management functions for metropolitan assets which will allow SA Water to better understand its assets and their need for renewal and replacement.
- ▶ Improving the depth of asset information held in Maximo to allow SA Water to undertake more quickly, and more fully, appraisal of needs identified for further investigation.
- ▶ More rigorous treatment of cost contingencies, including setting out specific guidelines for their incorporation in cost estimates, monitoring them at a program level, and moving to a risk based approach to estimating contingencies.
- ▶ Adopting a higher level, portfolio approach to managing and delivering the capital works program. This may identify opportunities to achieve the outcomes desired from the capital works program at a lower cost. We appreciate that SA Water is already moving in this direction.

We believe that the capital authorisation framework SA Water operates under is likely to generate inefficiencies. We recognise that changing this framework is largely out of SA Water's control. However, we believe that the following changes to this capital authorisation framework would lead to more efficient operation for SA Water:

- ▶ Complete confidentiality of capital cost estimates when referred to the State Government for approval.
- ▶ Referral for FFA after detailed design. This will remove any potential for estimates at concept design to be overestimated to allow for risks yet to be identified.
- ▶ Transferring more responsibility for capital expenditure approval from the State Government to SA Water executive and Board through a streamlined process and higher levels of delegation.

## 7 Operating expenditure

### 7.1 The base year 2011/12

The Company has chosen 2011/12 as the base position from which its projections to 2015/16 are made. The SA Water rationale for choosing this base year is that the key criterion should, to the greatest extent possible, reflect the prudent and efficient operating expenditure expected to be incurred during the forthcoming regulatory period. We concur with this view.

We have analysed the base year with reference to the profile of expenditure in the previous four years and also as to whether there are atypical or exceptional items that are not reflective of the operating environment in the period covered by the Plan.

We recognise that the past five years has presented significant challenges to the Business in relation to managing the implications of the severe drought including the measures put in place in improving the resilience of the infrastructure to deal with such situations, primarily the ADP and the NSIS projects. In addition, the Company has addressed historical issues related to the operation and maintenance of its assets through the Allwater Alliance and the bringing in-house of the operation and maintenance of ten water treatment works along the Murray.

The breakdown of operating costs by the activity centres in the ESCoSA template for the base year is shown in Figure 7-1.

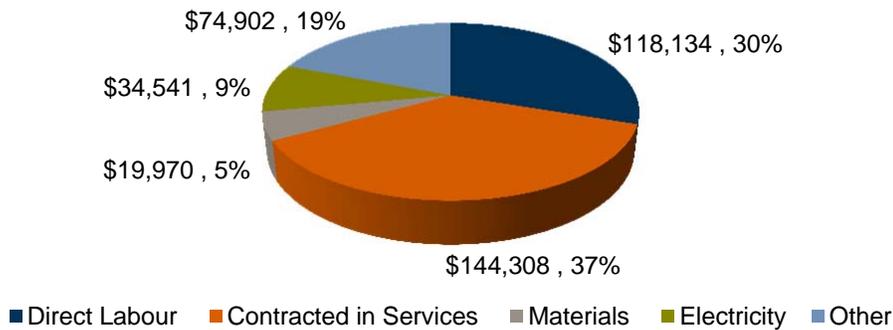


Figure 7-1 Operating expenditure in base year (2011/12) by activity (\$k)

By the end of the Plan period 2015/16 the breakdown of expenditure is forecast to be as shown Figure 7-2.

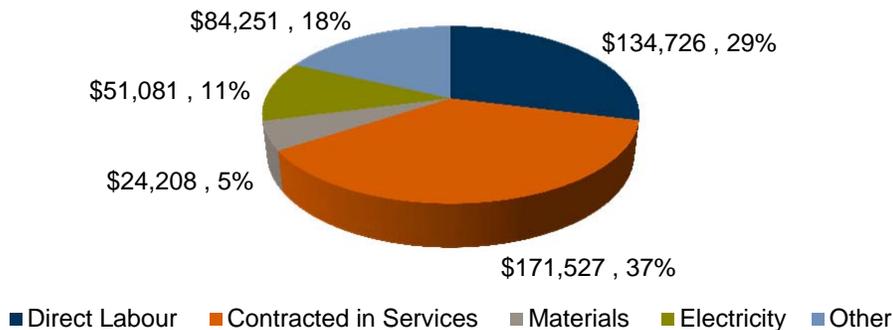


Figure 7-2 Operating expenditure in 2015/16 by activity (\$k)

Thus, there is no significant change in the make-up of operating expenditure compared to the base year; electricity shows a small increase, direct labour and other (which includes carbon tax, licence fees and regulatory costs) small decreases.

Table 7-1 compares the base year expenditure to the annual average expenditure in the four years 2007/08 to 2010/11. This analysis is based on the ESCoSA template cost allocations and is in cash terms, that is historic expenditure has not been inflated to base year prices.

**Table 7-1 Comparison of historic operating expenditure to base year expenditure**

Outturn prices	Average annual spend 2007/08 to 2010/11 \$k	Base year 2011/12 \$k	Variance base year to average historic spend %
Customer Services	36,008	31,567	- 12.3%
Infrastructure Management & Delivery	3,749	8,964	+ 139.1%
Operations	174,243	204,496	+ 17.4%
Water Quality and Environment	15,452	17,264	+ 11.7%
Head of Customer Services	1,230	1,657	+ 34.7%
Head of Asset Management	3,497	6,729	+ 92.4%
Head of Water Quality & Environment	1,557	427	- 72.6%
Finance & Business Support	19,798	24,957	+26.1%
Information Services	20,997	25,094	+19.5%
Corporate	18,610	22,250	+ 19.6%
People & Culture	10,119	11,385	+ 12.5%
Strategy Planning & Regulation	12,742	29,477	+ 131.3%
Governance Group	6,555	7,660	+ 16.9%
<b>Total</b>	<b>324,550</b>	<b>391,927</b>	<b>+ 20.8%</b>

The supporting documentation to the Proposal does not include a variance analysis of reasons why the base year differs from the historic spend. Thus, during our interview sessions we asked for explanations as to the reasons for these variations. The key reasons are summarised in Table 7-2. Within a number of the business units there are both upward and downward variances which to a degree balance each other.

**Table 7-2 Reasons for variance in base year operating expenditure compared to historic expenditure**

	Variance base year to average historic spend %	Key reasons for variance
Customer Services	- 12.3%	▶ Related to reduction in and cessation of drought management costs
Infrastructure Management & Delivery	+ 139.1%	▶ In-sourcing of metropolitan contract in 2010/11
Operations	+ 17.4%	▶ ADP costs are prime driver balanced to a degree by reduction in pumping and associated electricity elsewhere ▶ Implications of wastewater treatment enhancements

	Variance base year to average historic spend %	Key reasons for variance
Water Quality and Environment	+ 11.7%	<ul style="list-style-type: none"> <li>▶ Increases in environmental obligations</li> <li>▶ New arrangements were introduced whereby the costs of certain laboratory services are now reflected as direct water operating costs, rather than appearing as costs within the “laboratory services” expenditure category.</li> <li>▶ Enhanced prescribed burning program in accordance with a “Heads of Agency Agreement” between the Country Fire Service, SA Water, Department for the Environment, Water and Natural Resources, and Forestry SA, which specifies an annual target of 5% of high risk public land being subject to prescribed burning each year.</li> </ul>
Head of Customer Services	+ 34.7%	
Head of Asset Management	+ 92.4%	The key drivers of the upward movement were: <ul style="list-style-type: none"> <li>▶ Establishment of a Capital Project Management Office;</li> <li>▶ Establishment of enhanced contract management capabilities and contracting models; and</li> <li>▶ A change in the allocation of accommodation costs to the Infrastructure Management and Delivery group.</li> </ul>
Head of Water Quality & Environment	- 72.6%	The key reasons for the movement in costs within the Head of Water Quality & Environment expenditure category are: <ul style="list-style-type: none"> <li>▶ A reduction in maintenance costs due to relocation of the WQE workgroup from Bolivar to Victoria Square;</li> <li>▶ A reduction in external services and internal labour costs due to decreased water quality and River Murray monitoring activities (made possible due to ending of a severe drought);</li> <li>▶ Transfer of responsibility for procurement of Green Energy Certificates (Electricity) &amp; Carbon offsets to the Finance and Business Services unit, resulting in a reduction within this expenditure category;</li> <li>▶ A change in the costing of direct materials and consumables such that costs for these items are reflected within individual expenditure categories (e.g. Labs, Research), rather than being aggregated within the Head of Water Quality and Environment expenditure category; and</li> <li>▶ A change in the costing of investigations associated with climate change, such that these costs are aggregated within the Head of Water Quality &amp; Environment expenditure category.</li> </ul>
Finance & Business Support	+26.1%	<ul style="list-style-type: none"> <li>▶ Impact of centralisation of offices in Adelaide</li> </ul>
Information Services	+19.5%	<ul style="list-style-type: none"> <li>▶ Increase in staffing levels of some 19 FTEs in 2011/12</li> </ul>
Corporate	+ 19.6%	<ul style="list-style-type: none"> <li>▶ Various movements which broadly balance during the historic period.</li> </ul>
People & Culture	+ 12.5%	<ul style="list-style-type: none"> <li>▶ Increase in 11/12 related to enhanced program of graduate and apprentice training</li> </ul>
Strategy	+ 131.3%	<ul style="list-style-type: none"> <li>▶ Increase in 2011/12 reflects the introduction of Water Planning and</li> </ul>

	Variance base year to average historic spend %	Key reasons for variance
Planning & Regulation		Management Fees equating to approximately \$15.9m. ▶ ESCoSA licence fee
Governance Group	+ 16.9%	▶ An internal restructure where the Strategic Policy and Media group was established during 2011/12. Includes 6 staff transferred from the Stakeholder Relations group which no longer exists.
<b>Total</b>	<b>+ 20.8%</b>	

Based upon the explanations provided by the Company, we believe that the movements from historic to base year expenditure are justified in the context of their inclusion in the base year with adjustments being reflected in the Proposal for future years as appropriate. We were not made aware of any atypical or exceptional items that we would expect to be excluded from the base year costs. We discuss the efficiency of the base year below in Section 7.3.

## 7.2 Why is the future different from the past?

As noted above there have been significant movements in operating expenditure since 2007/08 reflected in the base year. Our interpretation of the Company Proposal is that it is predicated on the following:

- ▶ The base year operating expenditure reflects the prudent and efficient management of the business and thus no planning assumptions have been made with regard to on-going business efficiency although there are a number of variances during the plan period which reflect the dropping out of drought related expenditure under Customer Services and in the profile of operational expenditure related to the input of water from the ADP.
- ▶ The movement in operating expenditure arising from the in-sourcing of the 10 water treatment works along the Murray and in the implementation of the Allwater contract are reflected fully in the Proposal.
- ▶ The Proposal excludes investments in business efficiency that in effect are self-funding on a payback basis. Should such investment take place during the plan period then it will be reflected in the base at the next price review.
- ▶ The cost escalators related to labour, materials and contracted services have been applied consistent with the advice provided to the Company by Evans and Peck. Apart from the ADP, electricity cost escalators have been applied consistent with advice provided to the Company by Creative Energy Solutions using benchmarked forward wholesale and retail prices.
- ▶ The base year operating expenditure provides no headroom to accommodate increasing regulatory and operational requirements and thus these are shown as variances, generally upward pressures on costs.
- ▶ The operating expenditure consequences of capital are applied at the point at which beneficial use is achieved. The Company confirmed that such variances represent the incremental cost to the business from the current costs.
- ▶ The operating expenditure reflects the demand assumptions assumed in the Proposals.
- ▶ The ADP costs reflect the contractual requirements in respect of commissioning and proving as confirmed through a report by SKM.
- ▶ There are significant increases in 2012/13 from the base year, which are embedded within the plan proposal to 2015/16 but which fall outside the scope of the current price review period.

We have reviewed the variances to the base year and which form the basis of the summary analysis included in the Proposal. The variances identified by the Company are summarised in Table 7-3.

**Table 7-3 Summary of variances over regulatory period**

March 2012 Prices	Water Services				Sewerage Services			
	13/14 \$m	14/15 \$m	15/16 \$m	Total \$m	13/14 \$m	14/15 \$m	15/16 \$m	Total \$m
Asset renewal/operational requirements	6.6	9.3	11.2	27.1	5.8	5.4	5.6	16.8
Changes in demand	0.9	4.8	10.3	16.0	1.2	1.9	2.8	5.9
Comply with obligations	2.6	1.4	2.9	6.9	4.5	4.3	5.3	14.1
Other factors	1.1	1.1	1.1	3.3	1.1	1.0	1.1	3.2
Capital investment	11.8	10.5	8.4	30.7	2.0	2.4	2.6	7.0
<b>Total</b>	<b>23.0</b>	<b>27.1</b>	<b>33.9</b>	<b>84.0</b>	<b>14.6</b>	<b>15.0</b>	<b>17.4</b>	<b>47.0</b>
ADP Net	49.7	28.6	12.9	91.2				
Real Cost escalators	2.7	4.3	6.2	13.2	1.4	2.2	3.2	6.8

Source: SA Water Regulatory Business Proposal

The real cost escalators related to labour, materials and services have a significant net impact over the plan period as reflected in Table 7-4.

**Table 7-4 Real cost escalation assumptions**

Cumulative real cost escalator assumptions	2013/14	2014/15	2015/16
Labour	1.66%	3.38%	5.18%
Materials	- 2.22%	-3.84%	- 4.90%
Services	0.18%	0.45%	0.83%

With labour representing a significant element of the cost base in most cost centres the net impact by 2015/16 is an increase of \$9.4m as shown in Table 7-5.

**Table 7-5 Impact of real cost escalation of labour costs by year**

	Water Services				Sewerage Services			
	13/14 \$m	14/15 \$m	15/16 \$m	Total \$m	13/14 \$m	14/15 \$m	15/16 \$m	Total \$m
Impact of real cost escalation of labour costs	2.7	4.3	6.2	13.2	1.4	2.2	3.2	6.8

We discuss this further in the context of efficiency in Section 7.3.

Excluding the real cost escalators, Table 7-6 shows cost centres as defined on the ESCoSA template by the scale of variance.

**Table 7-6 Scale of variance in cost centre over regulatory period**

Reduction in costs by 2015/16	Costs unchanged	Increase in costs by 2015/16 less than \$1m	Increase in costs by 2015/16 greater than \$1m
Customer technical Services	Land Development & Connections	Customer Service Centre	Asset Management
Billing & Collection	Engineering	Infrastructure/Project Delivery	Water Operations
	Water Corrective Maintenance	Water Preventative Maintenance	Wastewater Operations
	Wastewater Corrective Maintenance	Wastewater Preventative Maintenance	Operations Support
	Treatment Management	Environmental Management	Operating Costs of ADP
	Land and Natural Assets	Laboratory Services	Accommodation
	Research	Procurement	Software and Application Support
	Head of Customer Services	Other Business & Finance Support	Other Information services
	Head of Asset Management	ICT Operations	Other Corporate
	Head of Water Quality	Head of People and Culture	
	Office of the CEO	OHWS & Support Services	
	Operational Taxes	Human Resources	
	Head of Strategy Planning & Regulation	Organisational Development	
	System Planning	External Affairs	
	Water Licence Management	Regulation	
	Drought Response Initiatives	Head of Governance	
	Insurance		

For those cost centres with a reduction in costs the reasons for the variance are detailed in Table 7-7.

**Table 7-7 Reasons for variance in cost centres showing reduction by 2015/16**

Cost Centre	Cost Saving Driver	2012/13 \$m	2013/14 \$m	2014/15 \$m	2015/16 \$m
<b>Customer Technical Services</b>	Transfer functions to Office of the technical Regulator	(0.868)	(1.735)	(1.735)	(1.735)
<b>Billing and Collection</b>	Additional resources to support customer hardship service	0.139	0.198	0.198	0.198
	Increase in Valuer General fees	0.051	0.104	0.159	0.216
	Cessation of H2ome rebate	(4.525)	(4.525)	(4.525)	(4.525)
	Cessation of standalone rainwater tank rebate	-	(1.646)	(2.479)	(2.479)
	<b>Total Billing and Collection</b>	<b>(4.335)</b>	<b>(5.869)</b>	<b>(6.647)</b>	<b>(6.590)</b>

For those cost centres with an increase in cost greater than \$1m by 2015/16 the reasons for variance are detailed in Table 7-8.

**Table 7-8 Reasons for variance in cost centres with an increase greater than \$1M by 2015/16**

Cost Centre	Additional Cost Driver	2012/13	2013/14	2014/15	2015/16
		\$m	\$m	\$m	\$m
<b>Asset Management</b>	Decommissioning of abandoned assets	-	1.0	1.0	1.0
	Transfer of functions to Office of Technical Regulator	(0.109)	(0.109)	(0.109)	(0.109)
	Operating expenditure associated with asset management labour	1.070	1.070	1.070	1.070
	Condition based inspection and assessment of assets	0.933	1.491	1.463	1.514
	<b>Total Asset Management</b>	<b>1.894</b>	<b>3.452</b>	<b>3.424</b>	<b>3.475</b>
<b>Water Operations</b>	Savings associated with insourcing of 10 water treatment plants	(1.585)	(2.866)	(2.866)	(2.866)
	Operating costs for the North – South Interconnection System	7.951	9.413	7.198	4.804
	Operating expenditure associated with insourcing of 10 water treatment plants	1.020	1.812	1.812	1.812
	Electricity costs to support water operations	(0.234)	0.931	4.717	10.188
	<b>Total Water Operations</b>	<b>7.151</b>	<b>9.289</b>	<b>10.860</b>	<b>13.937</b>
<b>Wastewater Operations</b>	Operating expenditure associated with process change - Bolivar	0.120	0.120	0.120	-
	Operating expenditure associated with upgrade of Bird-in-Hand WWTP	0.356	0.415	0.415	0.415
	Comply with wastewater discharge requirements at Murray Bridge	-	-	-	0.339
	Electricity costs to support wastewater operations	0.751	1.241	1.849	2.772
	Wastewater sludge management	-	-	-	0.301
	Comply with obligations relating to Bolivar DAFF plant	0.241	0.241	0.241	0.241
	Additional operating expenditure upgrade of Aldinga WWTP	-	0.388	0.388	0.388
<b>Total Wastewater Operations</b>	<b>1.468</b>	<b>2.405</b>	<b>3.013</b>	<b>4.456</b>	
<b>Operations Support</b>	Underground fuel tank removal	0.457	0.267	0.260	-
	Savings associated with insourcing of alarm monitoring	-	-	-	(0.151)
	Introduction of mandatory regional placements within graduate program	0.200	0.200	0.200	0.200
	Revise chlorine emergency management plans for selected sites	0.343	0.543	0.008	0.008
	OHS training and accreditation	0.412	0.362	0.362	0.362
	Upgrade & further development of asset monitoring & control systems	0.100	0.200	0.200	0.200
	Asbestos management	-	0.070	0.010	0.010
	<b>Allwater Alliance Costs</b>	<b>7.077</b>	<b>5.842</b>	<b>10.237</b>	<b>12.606</b>

Cost Centre	Additional Cost Driver	2012/13 \$m	2013/14 \$m	2014/15 \$m	2015/16 \$m
	<b>Total Operations Support</b>	<b>8.589</b>	<b>7.485</b>	<b>11.276</b>	<b>13.236</b>
<b>Operating Costs of ADP</b>	Operating costs of ADP	47.232	49.711	28.607	12.935
<b>Accommodation</b>	Consolidation of offices within the Adelaide CBD	1.015	1.494	1.494	1.494
<b>Software and Application Support</b>	Increase in software licences support fees	0.089	0.089	0.089	0.089
	Additional licences for Maximo 7 system	0.113	0.024	0.024	0.024
	Operating expenditure associated with IS labour not fully reflected in base	1.800	1.800	1.800	1.800
	<b>Total Software and Application Support</b>	<b>2.002</b>	<b>1.913</b>	<b>1.913</b>	<b>1.913</b>
<b>Other Information Services</b>	Operating expenditure associated with extended vendor support	0.032	(0.047)	0.032	(0.047)
	Additional operating expenditure associated with IS capital expenditure plan	0.278	1.165	2.475	2.945
	Operating expenditure IS licence costs due to purchase of additional software	-	0.143	0.249	0.195
	IS operating expenditure associated with upgrade of data storage	(0.023)	0.384	0.347	0.347
	<b>Total Other Information Services</b>	<b>0.287</b>	<b>1.645</b>	<b>3.103</b>	<b>3.440</b>
<b>Other Corporate</b>	Obligations under the carbon pricing mechanism	8.351	8.883	9.400	11.351
	Implementation of a single pay classification structure	0.242	0.242	0.242	0.242
	Change to capitalisation policy	0.237	0.489	0.757	1.040
	SA Water superannuation guarantee obligation	-	0.227	0.454	0.908
	<b>Total Other Corporate</b>	<b>8.829</b>	<b>9.841</b>	<b>10.853</b>	<b>13.541</b>

This analysis does not reflect the amendments submitted by SA Water to ESCoSA on 18 October 2012. These are shown in Table 7-9.

**Table 7-9 Amendments to operating expenditure submitted by SA Water**

Cost Driver	Attributed	2013/14 \$m	2014/15 \$m	2015/16 \$m
Operating expenditure associated with change to capitalisation policy	Water	- 0.328	- 0.507	- 0.697
Operating expenditure associated with change to capitalisation policy	Sewerage	- 0.161	- 0.250	- 0.343
Replacement of chains on tank scrapers	Sewerage	- 2.700	- 0.976	0.000
Electricity costs to support water operations	Water	0.526	0.282	0.389
Net Impact		- 2.663	- 1.451	- 0.651

In its Proposal, SA Water in Section 7.3 states that it:

*Proposes a relatively flat level of operating expenditure associated with delivery of its direct control sewerage services during the forthcoming regulatory control period and a declining level of operating expenditure associated with delivery of its direct control water services (which includes ADP related expenditure).*

We think this can be misinterpreted as our analysis shows an underlying increase in costs from the base year, as demonstrated in Table 7-10. This includes the adjustments advised on 18 October 2012 referred to above.

**Table 7-10 Total operating expenditure by year including net of ADP**

	2011/12	2012/13	2013/14	2014/15	2015/16
	\$m	\$m	\$m	\$m	\$m
Total operating expenditure	391.9	470.7	480.8	467.9	465.1
Total operating expenditure net of ADP	370.6	402.0	409.6	417.7	430.5

The variance in operating expenditure over the regulatory period compared with the base year is summarised in Table 7-11.

**Table 7-11 Variance in operating expenditure compared with base year**

Increase in costs from base year	2011/12	2012/13	2013/14	2014/15	2015/16
		% from base	% from base	% from base	% from base
Total operating expenditure		20.3%	22.7%	19.4%	18.7%
Total operating expenditure net of ADP		8.5%	10.5%	12.7%	16.2%

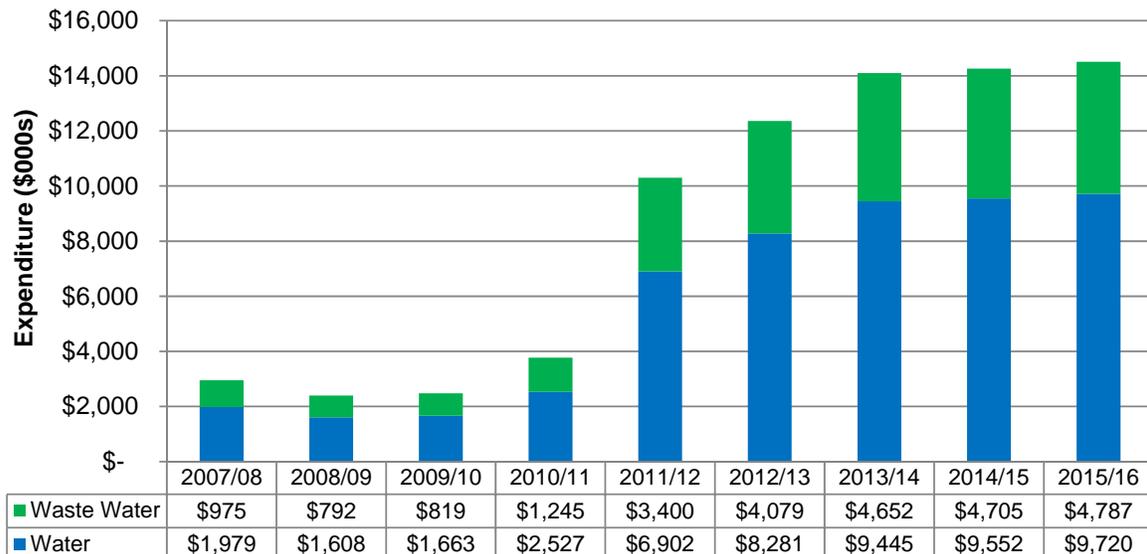
Whilst total operating expenditure including the ADP shows a decline in the increase from the base year Proposal Period, excluding the ADP provides a better reflection of underlying growth in the Company cost base.

We note the significant increase in costs between the base year and 2012/13, that is, the year before the three year period which is under review. These costs reflect in part new obligations, changes in operational regimes, the implications of the ADP and cost escalators including electricity.

We now consider in turn each of the cost centres which show a variance to the base year of greater than \$1M.

### 7.2.1 Asset Management

Figure 7-3 shows the trend in asset management costs from 2007/08 to 2015/16.



**Figure 7-3 Directly attributed costs – Asset management**

The significant rise in 2011/12 reflects the insourcing of the metropolitan contracts balanced by a reduction in Operations in the same year (See Figure 7-4).

The increases from the base year reflect the objectives of the Company to increase its asset management capability including an enhanced program of condition based inspection and assessment of assets. The understanding of the asset base is critical for the medium to long term planning for the effective and efficient utilisation of the assets and in respect of their maintenance and renewal. We would expect to see the results of this enhanced program reflected in the Company's next Regulatory Proposal. We have noted that the program of corrective and preventative maintenance broadly flat lines over the Plan Period indicating that the Company does not appear to be pre-empting the outcome of its increasing focus on asset management.

Provision is made in the Plan for \$1m per annum related to the decommissioning of assets. The Company currently estimates some 350+ assets that are currently abandoned that require further investigation. Its preliminary work shows a prioritised listing of the top 30 projects which pose the highest risk to SA Water over the next 4 years. A risk based approach to defining need has been applied but the costing appears to be preliminary estimates from which an average cost of some \$100,000 per site has been derived. Thus, over the Plan Period SA Water is planning to decommission 30 of its high risk sites. We are not aware if the estimates are net of any potential land value that may be realised or whether decommissioning of the assets may lead to savings elsewhere.

## 7.2.2 Water Operations

Figure 7-4 shows the trends in water operations costs.

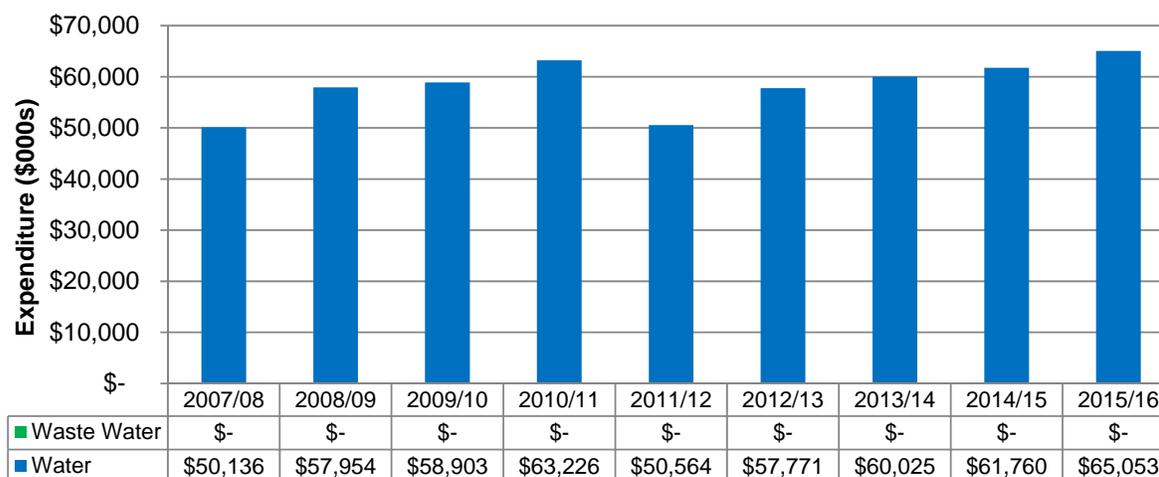


Figure 7-4 Directly attributed costs – Water operations

The reduction in 2011/12 reflects the insourcing of the metropolitan contracts balanced by the increases in asset management.

A key driver for cost increases from the base year relate to the operating costs for the North – South Interconnection System coming into effect in 2012/13. The NSIS project will primarily be used to transfer desalination water to various locations in the metropolitan network when customer demand in the southern metropolitan network is not sufficient to consume the entire output of desalination water. The costs relate to electricity costs to pump water through the network; and services costs comprising a range of costs including Control Room costs, IT costs and operations and maintenance costs.

The NSIS project is expected to be used to transfer desalinated water during the regulatory control period, thus costs decline from 2013-14 as the water production from the ADP is wound down, however, many of the necessary fixed service costs are assumed to remain.

The costs are summarised in Table 7-12.

**Table 7-12 Costs for NSIS**

March 2012 prices	2012/13 \$m	2013/14 \$m	2014/15 \$m	2015/16 \$m
Fixed Electricity	1.016	1.016	1.016	1.016
Variable Electricity	3.090	4.440	2.320	0.000
O&M	0.842	0.959	0.851	0.730
Labour	1.080	1.080	1.080	1.080
Control Room Operational Costs (SCADA, Comms.,Admin.)	1.300	1.300	1.300	1.300
Building Rental	0.600	0.600	0.600	0.600
<b>Total</b>	<b>7.928</b>	<b>9.395</b>	<b>7.167</b>	<b>4.726</b>

Source: SA Supporting Document OX0014-B

We note that whilst the electricity costs are shown as variable dependent on the input assumptions from the ADP that all other costs are assumed to be fixed. The Company explained that:

*The NSIS and the associated control room will remain in service at all times, regardless of ADP activity. There is no “dormant” period for the NSIS, so the “non-electricity” costs associated with operating the NSIS and the control room will not fluctuate significantly from year to year or season to season. The key variable cost component of operating the NSIS (electricity) will fluctuate as the volume of water distributed through the network changes. A key driver of such fluctuation will be the volume of water produced by the ADP.*

*The control room will provide monitoring and control capabilities for other parts of the metropolitan water network, but will not result in off-setting operating expenditure savings elsewhere. The personnel, systems and other resources currently employed in SA Water’s pre-existing control room are being relocated to the new control room, and will be augmented by additional personnel and systems required for monitoring and control of the NSIS.*

The second key cost driver relates to electricity costs. The forecast increases are net of adjustments related to the ADP project. The Company’s current contracts expire on 30 June 2013 and it is currently awaiting formal approval to move to procurement for future electricity.

SA Water has developed a series of models and assumptions to forecast electricity expenditure that includes all existing SA Water sites connected to the national electricity system. Components of SA Water’s retail electricity charges are separately forecast by applying published or independently modelled cost indexation provisions for each of these components. SA Water has relied on this model to forecast water electricity expenditure for the forthcoming regulatory control period.

SA Water negotiates contracts with electricity suppliers on price and forecast volume. Unit electricity prices are currently set under contract up to 30 June 2013. For future years, electricity unit prices have been based on external forecasts and published growth rates for ETSA Utilities and Electranet (network prices).

The unit price changes assumed within the Plan are shown in Table 7-13. Those for 2011/12 and 2012/13 reflect current contract rates

**Table 7-13 Movement in electricity prices**

\$MWh 2012 prices	2011/12	2012/13	2013/14	2014/15	2015/16
Major Pumping	36.96	36.93	37.35	38.38	41.44

\$MWh 2012 prices	2011/12	2012/13	2013/14	2014/15	2015/16
Large Sites	53.78	52.70	52.28	53.74	58.02
Small Sites	86.70	84.58	88.94	96.03	94.21

The profile of costs reflects in the initial period the input of water from the ADP and significant uplift in cost in the final two years relates to the reducing profile of input water from the ADP resulting in increased pumping from other sources.

There is uncertainty over the future of energy prices within the Proposal Period. The effectiveness of SA Water procurement of electricity will determine the degree to which the plan assumptions are exceeded or out-performed.

### 7.2.3 Wastewater Operations

Figure 7-5 shows the trend in wastewater operations costs.

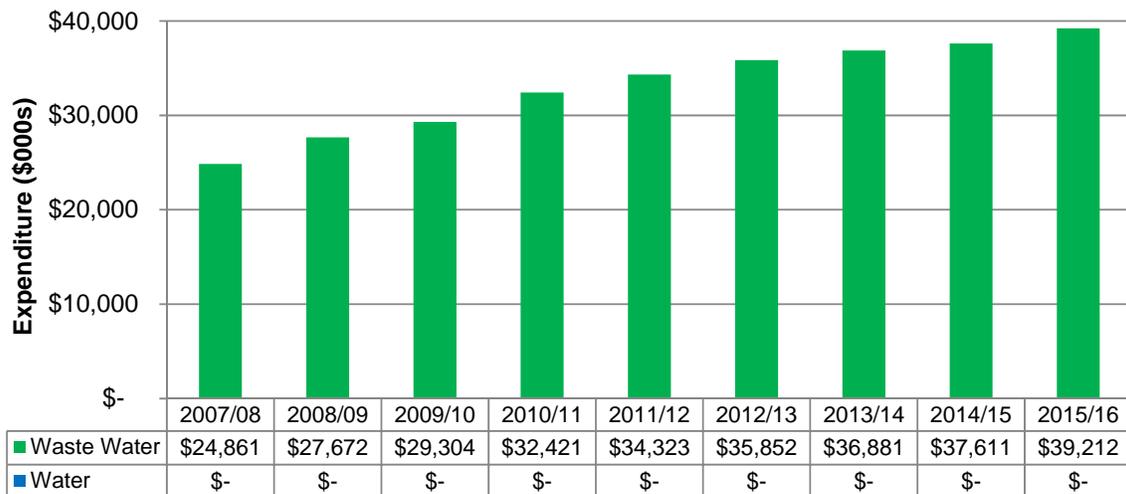


Figure 7-5 Directly attributed costs – Wastewater operations

There are two key cost drivers reflected in the increasing profile:

- ▶ Electricity costs – similar in principle to water operations.
- ▶ Process, sludge and other operational requirements – these largely relate to process and upgrade requirements at specific works.

In relation to the latter the increase in costs of \$0.388m per annum related to the upgrade of the Aldinga WWTP from 2013/14 should be deferred out of the Plan Period consistent with our proposed adjustment to the capital scheme described in Section 8.4.

### 7.2.4 Operations Support

Figure 7-6 shows the trend in operations support costs.

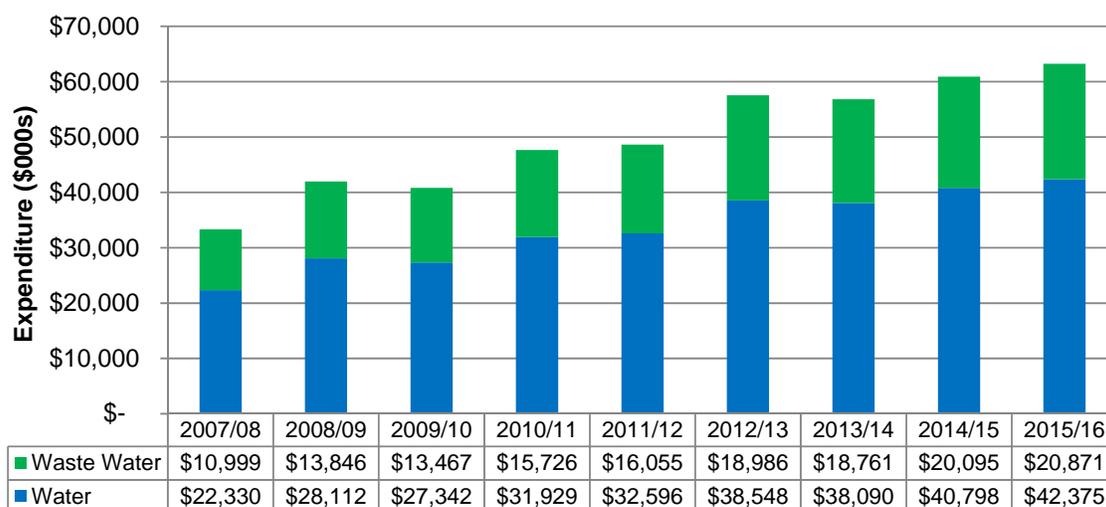


Figure 7-6 Directly attributed costs – Operations support

The key cost driver relates to the Allwater contract. The operation and maintenance activities of the metropolitan networks and treatment plants have been outsourced since 1996. In March 2011 SA Water entered into an Alliance contract for operation, management and maintenance of Adelaide's metropolitan water, sewerage and recycled water infrastructure.

The Allwater alliance contract commenced on 1 July 2011 for a term of 10 years. The Company told us that the alliance contract includes flexible mechanisms to alter and adjust the scope of services and delivery parameters and is managed through an extensive performance management regime covering all elements of operational service delivery.

The uplift in costs from base year reflects:

- ▶ The full year impact of the Allwater contract of some \$4.8m.
- ▶ A \$1m increase in preventative maintenance to allow for the fact that there was limited visibility over the level of preventative maintenance conducted by United Water in the later stages of that contract.
- ▶ The operating expenditure implications of the Christies Beach WWTP of some \$2.2m.
- ▶ A further \$1.3m has been provisioned for the O&M Services Fee reflecting increases in contract scope, budgetary and operational performance.
- ▶ A reduction of some \$2.2m related to the volumetric assumptions of water input from the ADP which drops out in the final two years of the Plan period consistent with water demand assumptions.

We noted the comfort provided to the Company as referred to in its proposal on page 133 by the Review undertaken by Ernst and Young related to the Metropolitan Operations and Maintenance Alliance Contract. (G1 Supplementary). In the context of a continuous improvement culture we think two of the recommendations in that Ernst and Young Report are relevant:

*The performance of the metropolitan O&M Alliance to date sets out the importance of an ongoing benchmarking of costs. Ernst & Young recommends this include a comparison back to costs under the long term service contract with United Water, against relevant, comparable costs from water utilities interstate and against SA Water's regional operations. This is recognised by SA Water and it was reported that KPIs are currently being developed.*

*It is recommended, as more data and information is collected over the next financial year, SA Water should challenge the robustness of the cost estimates. It is recognised that SA Water are currently*

*developing information management systems and identifying performance measures to capture this data.*

Thus, whilst the forecasts included in the Proposal for the Allwater contract represent current best estimates, the need to challenge the robustness of the estimates is a key recommendation in the E&Y Report.

### 7.2.5 Operating Costs of ADP

The graph below shows the trend in costs for the ADP.

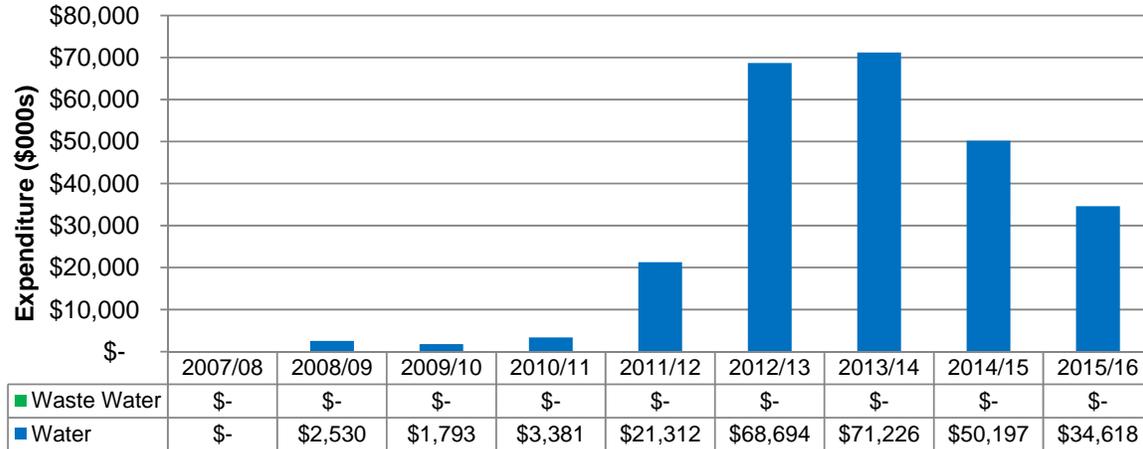


Figure 7-7 Directly attributed costs – ADP support

We have noted that the ADP operating costs have been independently reviewed by SKM who concluded that they reflect a prudent and efficient approach to the management and operation of the ADP. We are not in a position to review in detail the basis of the costings but in the light of the SKM confirmation that they do reflect the contractual requirements our assumption is that they reflect the Company's current best estimate.

The SKM review discusses options in relation to reducing the timescale of the proving period which they relate to levels of increasing risk in relation to the future operations of the plant. Given the significant investment in the ADP and the security of supply it provides in the context of future drought scenarios the proving strategy may be viewed as critical in future decisions relating to the role of the ADP in the future management of supply/demand in differing drought scenarios.

Electricity costs are a key element of the ADP forecast costs. The Company explained its approach to the procurement of ADP power consistent with the requirements of the permissions related to the plant in the context of renewable sources. We understand that contractual commitments are in place for 20 years independent of the procurement of electricity for the remainder of SA Water's operations. Thus, in the context of the Regulatory Proposal the issue is not one of unit cost but rather the volume of power consumed.

We considered whether the costs associated with the proving period might be considered as part of the capital requirements related to the commissioning of the plant. However, in the context of the SA Water capitalisation policy, and the beneficial use of ADP water input to the network during the proving period, the allocation of some of the costs to operating expenditure seems appropriate. We do think that there is a case for SA Water, in consultation with its financial auditors, to consider whether all elements currently allocated to operating expenditure are appropriately allocated, for example membrane replacement, which we understand have a useful life of five to seven years. In addition, there may be a case for the marginal cost increases arising during the proving period, that is the net increase in costs taking account of the reduced supply from the Murray sources during the period, be treated as part of the commissioning costs and allocated as capital.

SA Water told us that in developing its operating expenditure forecast it modelled the mix of water to be provided from different sources to service demand within the Greater Adelaide metropolitan area. An important aspect of this modelling involved development of a forecast of the water to be produced by the ADP during the regulatory period, with compensatory reductions in the volume of water to be provided from other sources (leading to operating expenditure savings).

Adjustments incorporated within SA Water's operating expenditure model that are materially influenced by the volume of water to be produced by the ADP are:

- ▶ Operating costs for the NSIS.
- ▶ Electricity costs to support water operations.
- ▶ Allwater alliance costs.

The forecast volume of water to be produced by the ADP which underpins this modelling is detailed in Table 7-14.

**Table 7-14 Forecast water production from ADP**

	2012/13	2013/14	2014/15	2015/16
Forecast ADP water production volume (GL)	61.82	64.77	34.41	-

We asked the Company if it could provide a "high level cost benefit analysis of the ADP" which SA Water has correctly interpreted to mean "a high level indication of the increases and decreases in operating expenditure arising elsewhere in SA Water's operating expenditure modelling as a result of operating the ADP". SA Water provided the following analysis by comparing:

1. The variations referenced above as incorporated within the RBP (which align with the forecast ADP water production volume, also referenced above).
2. Calculation of the same variations under a hypothetical scenario in which zero water is produced by the ADP between 2012/13 and 2015/16 – essentially, posing the question "what would these costs be if the ADP water wasn't produced?"

The Company told us that:

*The operating expenditure increases and decreases derived through this comparison represent the high level cost benefit of the ADP, and are summarised in the table below (reproduced as Table 7-15). Note that the amounts shown in the table are expressed as increases and decreases in operating expenditure arising elsewhere in SA Water's operating expenditure modelling as a result of operating the ADP, and therefore a negative dollar amount represents a cost saving or "avoided cost" attributable to ADP water production.*

**Table 7-15 Related operating expenditure due to operation of the ADP**

Variation Title	2012/13	2013/14	2014/15	2015/16
Operating costs for the North-South Interconnection System	+\$3.4M	+\$4.6M <sup>1</sup>	+\$2.4M	-
Electricity costs to support water operations	-\$4.3M	-\$3.5M	-\$2.7M	-
Allwater Alliance Costs	-\$6.4M	-\$7.4M	-\$3.2M	-
<b>Net operating expenditure saving (avoided cost) incorporated within SA Water's RBP modelling</b>	<b>-\$7.3M</b>	<b>-\$6.3M</b>	<b>-\$3.5M</b>	<b>-</b>

<sup>1</sup> NSIS operating expenditure moves in-line with the volume of ADP water produced (given the primary role of the NSIS, which is to distribute ADP water). Therefore, higher NSIS costs during years of ADP water production offset the cost savings incorporated elsewhere within SA Water's modelling.

We have noted that these net avoided costs have been reflected in the SA Water Regulatory Proposal.

### 7.2.6 Accommodation

Figure 7-8 details the trends in accommodation costs.

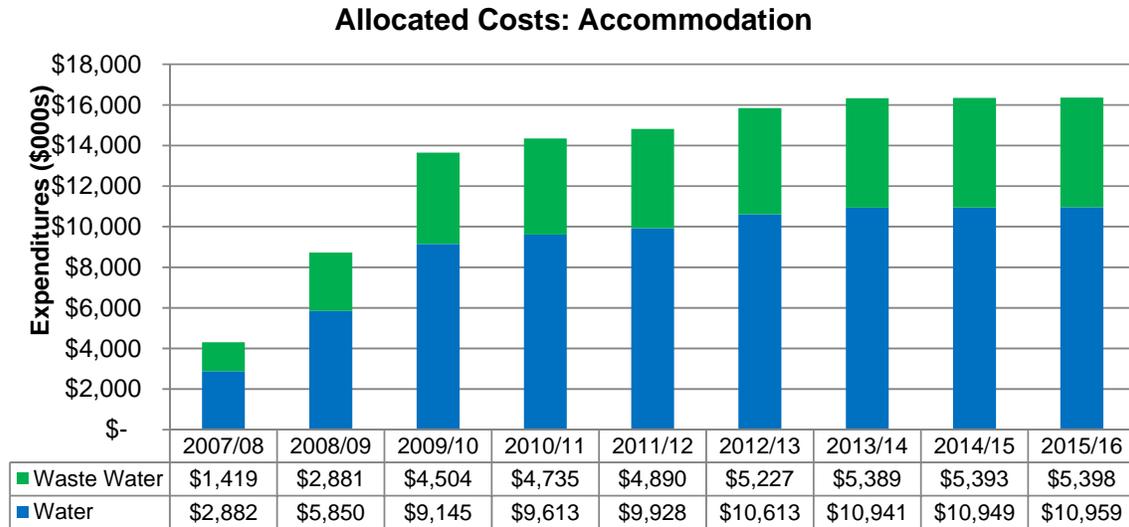


Figure 7-8 Allocated costs – Accommodation

SA Water's long term strategy is to consolidate its Adelaide leased accommodation to three sites. The justification for the strategy is that the consolidation of leases provides a NPV saving of \$2.6m compared to the option of remaining in the existing Adelaide leased accommodation.

The Company confirmed that if it was to remain in the existing Adelaide leased accommodation, the operating expenditure adjustment that would be required to base year costs would be substantially higher than the \$1.5M adjustment that is proposed, and therefore represents an example of savings and efficiencies incorporated within SA Water's Regulatory Business Proposal. We think that based upon the evidence provided to us that the decisions made in respect of consolidation of office accommodation makes sound business sense. However, the savings and efficiencies referred to by the Company are avoided future costs, there remains a net increase in the 2011/12 cost base.

### 7.2.7 Software and Applications Support

Figure 7-9 shows the trends in applications support.

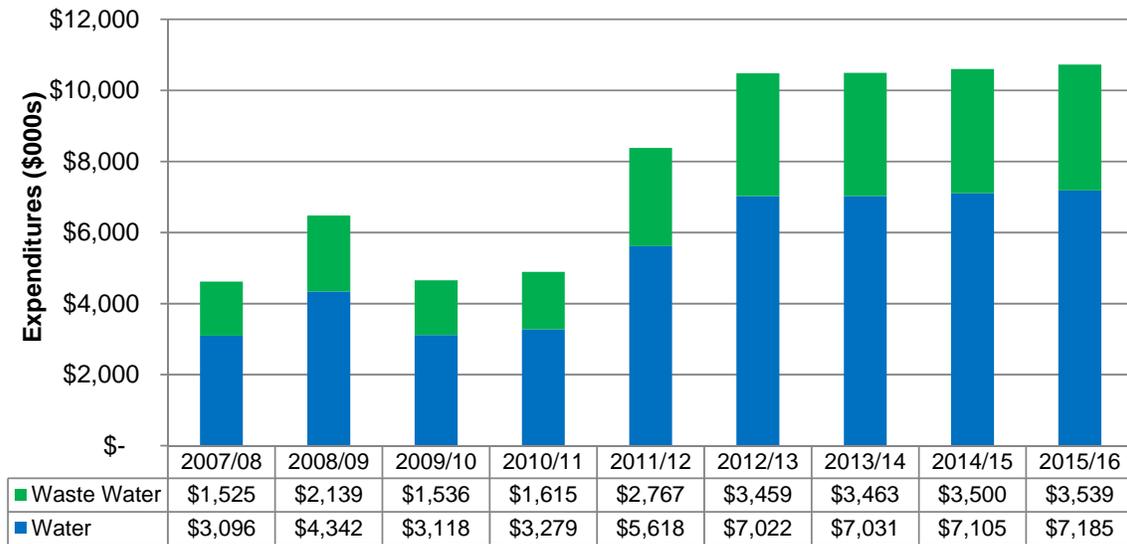


Figure 7-9 Allocated costs: Software and application support

The key driver for the uplift in costs is the operating expenditure associated with IS labour not fully reflected in the base year of some 19 full time equivalents. This represents the full year effect of decisions made in 2011/12 related to increased internal IS resources.

### 7.2.8 Other Information Services

Figure 7-10 shows the trends in other information services costs.

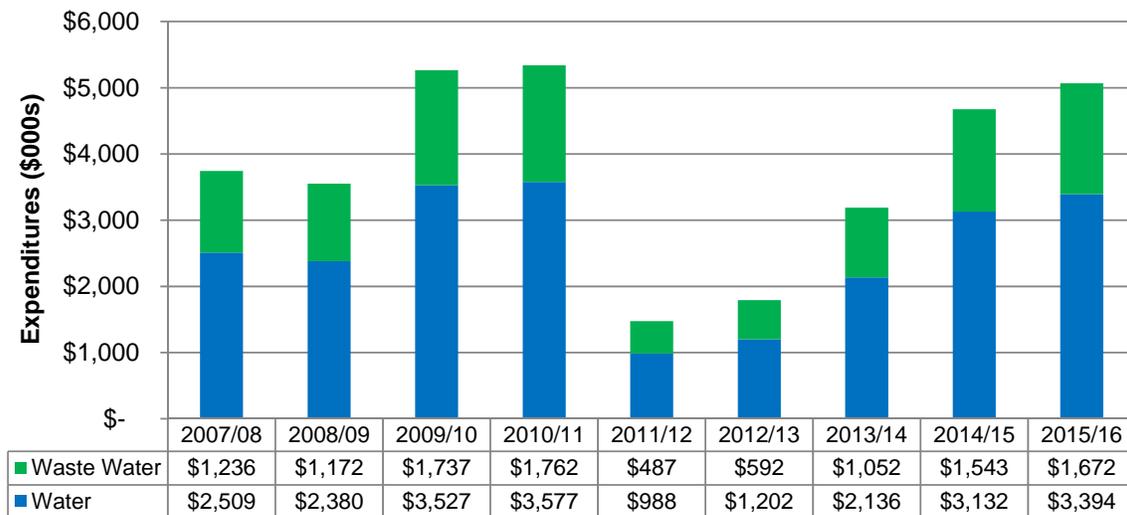


Figure 7-10 Allocated costs – Other information services

The main cost driver in the uplift is the operating expenditure consequences of the IS capital expenditure plan. The Company told us that the IT capital expenditure proposed within the RBP is limited to expenditure required to address Business Process Risk, Infrastructure Risk or Business Application Risk. Its view is that, in practical terms, the IT capital expenditure will primarily deliver technical upgrades of existing technology solutions that have reached the end of their useful lives in a “like-for-like” manner, and new functionality required to comply with emerging obligations (such as new reporting requirements associated with the

emerging regulatory framework associated with the introduction of economic regulation. We comment further on the implications of the proposed IS strategy in the section on efficiency below.

### 7.2.9 Other Corporate

Figure 7-11 shows the trends in cost for other corporate.

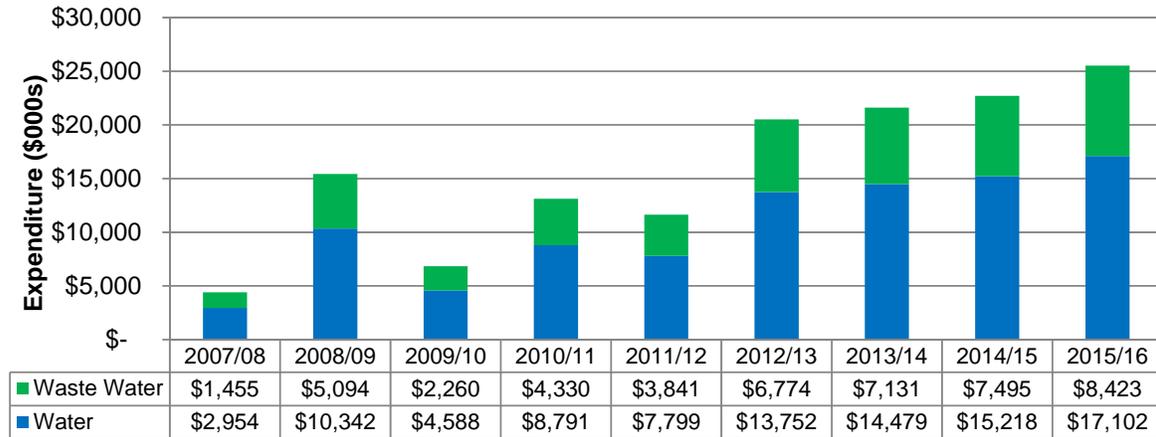


Figure 7-11 Allocated costs – Other corporate

The key driver for the uplift in costs relates to the carbon pricing mechanism which commenced in July 2012. The Company considers that based on the current legislated carbon price mechanism and assumed facility definitions, SA Water will have a direct liability for fugitive emissions of methane and nitrous oxide from its Bolivar wastewater facility. In addition, the Company proposed funding includes a requirement to purchase carbon permits and to fund the uplift to goods and services procured by SA Water to provide water and sewer services in South Australia.

SA Water has assumed a fixed price of \$23.00, \$24.15 and \$25.40 for permits for first three years (as per legislation refer "OX0047-E Clean Energy Act 2011") and an estimate provided by SKM for the final year of the regulatory period. We note that the prices are consistent with the Clean Energy Act 2011 page 130.

## 7.3 Operating cost escalation

In implementing its regulatory framework, ESCoSA has to decide whether to allow for increases in real costs over and above the level of consumer inflation allowed for in the CPI-x model. CPI, as a measure of general inflation, does not directly measure the cost of the inputs that SA Water will use to produce its services. However, a measure of general inflation such as CPI is typically used by regulators because it is calculated transparently by an independent organisation, is difficult for the regulated utility to manipulate and is freely available. Further, although input prices are typically quite volatile, over the medium and long term, they tend to follow the movement in general inflation.

If a regulated utility faces input costs higher than CPI during the regulatory period it may find itself in financial distress as it tries to deliver services while facing higher costs and fixed revenues. Conversely, where input costs are lower than CPI, the regulated utility will make extraordinary profits that it is not compelled to share with its customers.

The Company sought the advice of Evans and Peck<sup>18</sup> in relation to the most likely cost escalator rates and has subsequently incorporated these into its planning assumptions. We discuss the approach taken by Evans and Peck to determine these escalators in Section 8.3. Table 7-16 details the input cost escalation factors determined by this approach.

<sup>18</sup> Review of Indexation Rates for Operating Expenditure, Evans and Peck, June 2012

**Table 7-16 Forecast of real input cost escalation for operating expenditure**

	2012-13	2013-14	2014-15	2015-16
Internal labour (%)	1.66	1.69	1.74	1.77
Materials (%)	-2.22	-1.66	-1.10	-0.48
Contracted Services (%)	0.18	0.27	0.38	0.48

We note some \$20M net increase in operating costs in the three year plan period related to these cost escalators of labour, materials and contracted services. The Plan assumes that the Company will experience these cost increases. Clearly there are uncertainties in relation to whether these costs will be realised, in particular related to the Company management of these cost drivers through the effectiveness of its procurement and labour strategy.

The Plan assumes that the cost escalators are net of assumed CPI during the Plan Period. In the UK regulatory regime such cost pressures are assumed to be at the risk of the water company, the assumption being that the CPI (in the UK RPI) will cover the broader inflationary issues. This is also the case in other jurisdictions in Australia, for example in New South Wales, as administered by the Independent Pricing and Regulatory Tribunal.

We recommend that SA Water's cost real escalation assumptions related to labour, materials and contracted services not be allowed in its prudent and efficient level of operating expenditure. We do not take issue with the conclusions of the Evans and Peck Report related to operating cost escalators. However, we believe that there is insufficient justification for allowing an increase above CPI for the following reasons:

- ▶ We have agreed with SA Water's proposal to allow for cost increases relating to electricity over and above CPI. Electricity comprises one of SA Water's largest input costs risks so mitigating this uncertainty will reduce any pressure faced by the business due to increased costs in other areas.
- ▶ There is no evidence of the South Australian or Australian economy being in a state of high growth that could lead to the movement in the price of these inputs significantly exceeding their long term trend to broadly follow general inflation.
- ▶ Allowing real costs escalation above CPI would weaken the incentives inherent in CPI-x regulation to generate cost savings.

Considering the escalation factors in Table 7-16, the factors for materials are negative, i.e. suggesting cost decreases in the regulatory period. The other two trends are positive and therefore lead to increased forecasts for real costs in the period. This shows that the CPI-x methodology, which allows for a flat escalation rate, can be beneficial to the business in the areas where real cost decreases are forecast.

## 7.4 Efficiency

The concept of continuing and catch-up efficiency was developed under the UK regulatory model, based upon the principle that there is a frontier company which is the most efficient water company in the sample used for benchmarking. Efficiency gains at the frontier are referred to as continuing efficiency, with catch-up applied to companies that are behind the frontier company on the assumption that they have greater scope to make improvements.

The UK regulator, Ofwat, as part of its periodic review of prices in 2009, commissioned research from Reckon LLP<sup>19</sup> in respect of the scope for continuing efficiency and undertook econometric modelling in respect of catch-up efficiency. This report concluded that for the five year period to 2014/15:

<sup>19</sup> PR09 Scope for Efficiency Studies, Reckon LLP, October 2008

*We forecast a rate of growth of 0 per cent per year relative to the RPI, for both water and sewerage. This is under an assumption of no changes in the quantity and quality of outputs of the water and sewerage industries, and no changes in the amount and quality of capital.*

*We have made our forecast of 0 per cent per year on the view that the cost reductions relative to the RPI in the 1990s were brought about by privatisation and the development of incentive regulation, and that there will not be corresponding opportunities in the period from 2010 to 2015. A growth rate of 0 per cent does not imply no ongoing productivity improvements at the industry level; simply that productivity growth will be cancelled out by above-RPI increases in input prices.*

Ofwat, in its Final Determination, included in its price limits challenging assumptions of future efficiency savings over and above those achieved in the economy as a whole. It concluded that there was still scope for the best performing companies to make further real efficiency improvements and assumed a 0.25% per annum continuing efficiency for base operating expenditure and for enhancement operating expenditure one and a half that of base operating expenditure. For catch-up efficiency, based upon its econometric modelling, Ofwat assumed that a company will close 60% of the assessed efficiency gap to the frontier performance by 2014-15, with equal improvement steps in each year. Efficiency targets are also applied by economic regulators in different jurisdiction in Australia as detailed in Table 7-17.

**Table 7-17 Operating expenditure efficiency targets in other Australian jurisdictions**

Regulator	Regulated business	Year	Annual operating cost efficiency (average only)	Note
Independent Pricing and Regulatory Tribunal (New South Wales)	Sydney Water	2008	0.7%	
Independent Pricing and Regulatory Tribunal (New South Wales)	Sydney Water	2011	0.91%	
Economic Regulation Authority of Western Australia	Water Corporation	2012	2%	Decision is draft only. This has historically been a self-imposed efficiency target that the regulator has chosen not to exceed. However, it has previously only applied to 'base' expenditure. Following a rise in non-base expenditure, the efficiency target is proposed to now apply to all operating expenditure
Essential Services Commission of Victoria	All Victorian water businesses	2012	1%	Guidance note: "The Commission requires all businesses to achieve a minimum of 1 per cent per year productivity improvement on its baseline operating expenditure."

In its submission SA Water has detailed the evidence from three separate approaches to assessing its relative efficiency and observes that it consistently benchmarks favourably. This is despite the significant challenges inherent in SA Water's operating environment which lead to materially higher operating costs and the fact that SA Water is one of only three Australian water utilities serving more than 100,000 connections on a state-wide basis.

We have noted that the National Water Commission, National Performance Report 2010/11 for Urban Water Utilities shows South Australia (Adelaide) as having the lowest unit cost per property for combined water and sewerage activities at \$422 per property compared to a median of \$745.

The body of evidence that we have reviewed does show that on a relative basis SA Water is an efficient water and sewerage utility. However, SA Water also accepts in its Submission<sup>20</sup> that it agrees with ESCoSA's view that benchmarking provides a useful input for assessment of the prudence and efficiency of proposed expenditure, but that it does not in itself provide an adequate basis to establish efficient expenditure benchmarks.

Our understanding of the SA Water submission is that it has not assumed an on-going or catch-up efficiency factor in its proposed operating expenditure to 2015/16. It has identified adjustments to the base year, both ups and down, but these are related specifically to:

- ▶ Capital investment.
- ▶ Asset renewal and operating requirements.
- ▶ Changes in demand.
- ▶ Compliance with obligations.
- ▶ Other factors including the takeover of the operation and maintenance of 10 water treatment plants along the Murray, consolidation of offices, training and customer programs.
- ▶ The ADP program.
- ▶ Real cost escalation.

Disentangling true efficiencies from other cost movements within and additional to the base is fraught with difficulty. It does appear that many of the operational efficiencies referred to in the Company submission are already embedded within the base position and current year 2012/13 including the decision made by SA Water to take over the maintenance and operation of 10 water treatment works along the River Murray following expiry of an operation and maintenance contract with the constructor of the plants and the benefits in energy management through pump optimisation. Other significant reductions we have noted during the Plan Period include the implications of input of water from the ADP Plant reflected in avoided costs over the Plan Period related to the operating costs for the NSIS, electricity costs to support water operations and Allwater Alliance costs.

We noted in the SA Water Corporate Business Plan 2012-16 that a key objective in relation to Financial Management is (Page 22):

*To drive reductions to the real operating cost of delivering services and delivery of regulatory capital expenditure commitments.*

With the supporting strategy:

*Reduce annual change in unit price of key cost inputs through negotiation with suppliers.*

The Company in our meetings with them stressed the importance of a culture of continuous improvement that is reflected in a number of initiatives including the insourcing of water treatment works operations referred to above, energy management, the NSIS and the introduction of the Allwater Contract. We recognise the importance of these initiatives both in terms of cost control and the resilience of its networks. However, these have largely been embedded within the business or separately accounted for within the Plan adjustments.

We noted the comfort provided to the Company as referred to in its proposal on page 133, by the review undertaken by Ernst and Young related to the Metropolitan Operations and Maintenance Alliance Contract. (G1 Supplementary). In the context of a continuous improvement culture, as we refer to in section 7.2 above, we think two of the recommendations in that Ernst and Young Report are relevant:

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<sup>20</sup> p121, SA Water Regulatory Business Proposal

*The performance of the metropolitan O&M Alliance to date sets out the importance of an ongoing benchmarking of costs. Ernst & Young recommends this include a comparison back to costs under the long term service contract with United Water, against relevant, comparable costs from water utilities interstate and against SA Water's regional operations. This is recognised by SA Water and it was reported that KPIs are currently being developed.*

*It is recommended, as more data and information is collected over the next financial year, SA Water should challenge the robustness of the cost estimates. It is recognised that SA Water are currently developing information management systems and identifying performance measures to capture this data.*

We discussed with the Company its plans for IS investment over the plan period. There are significant capital costs and associated increases in licences and software support. The Company told us that it was not including within its plan proposals IS investment related to self-funding efficiency improvements which we take to be a payback period of up to three years. Whilst we find it surprising that such investment and associated savings are not reflected in the Plan we make the following comments in relation to the proposals included within the Plan.

IS proposals are a fundamental enabler in the Company aim to leverage the existing investment in business intelligence including improved data management and reporting. In addition the Plan provides for the refreshment and replacement of desktop, storage and servers. We comment in more detail on the Financial Reporting Project in Section 8.4. We have noted the KPMG report commissioned by SA Water to review the IS components for prudence and efficiency. This report has provided comfort to the Company that its IS plans are prudent and efficient but notes that analysis and supporting documentation of the proposed projects over the regulatory period are at differing levels of depth with detailed business cases to be prepared for all projects. The Report also recommends that SA Water should investigate the apparent anomaly in the comparison of benchmarking metrics related to IS operating expenditure as a percentage of total corporate operating expenditure being higher than the average of the KPMG Survey for 2011.

We would expect to see as part of the business case development an analysis of how the project benefits contribute to the efficient management of the business as a whole including cost benefits. Even accepting that the IS plan included in the Proposal excludes IS initiatives directly associated with business efficiencies, we are surprised that there is no recognition in the Plan of the potential contribution those IS Projects included in the Plan can make to business efficiency in other parts of the business, for example through improved data management and reporting.

We have to make a judgement on efficiency based upon the evidence we have seen at SA Water and in our experience elsewhere. We recognise that this is the first regulatory submission being made by SA Water and we think it important that there should continue to be both internal and external challenge to its cost base in relation to both its risk profile and the maintenance of service standards.

We propose a phased continuing efficiency as detailed in Table 7-18.

**Table 7-18 Proposed continuing efficiency factors for operating expenditure**

	2013/14	2014/15	2015/16
Continuing efficiency factor	1%	2%	2%

We have assumed a transition period leading to the higher level of 2% pa on the basis that it gives SA Water a period in which to plan for and deliver the operating expenditure savings. Thus by the end of the plan Period the challenge to SA Water is to reduce its cost base by close to 5% compared to 2011/12 as adjusted by the 2012/13 increases. We believe that in principle this is consistent with the SA Water Corporate Business Plan objective as referred to above in driving reductions to the real operating cost of delivering services.

## 7.5 Recommended prudent and efficient operating expenditure

It is noticeable that there have been significant increases in the 2011/12 base year costs to 2012/13 reflecting primarily new obligations including taxes and licence fees and the beneficial use arising from the ADP project. These costs are largely embedded within the Plan Period and whilst drought related costs drop out and the profile of costs related to the ADP and the more general management of the business moves over the three years, there is a significant underlying increase in cost related primarily to:

- ▶ The real cost escalators of labour, materials and contracted services.
- ▶ The increased focus on asset management.
- ▶ The increase in energy costs.
- ▶ The operating expenditure associated with the capital investment program.

Consistent with our review methodology as set out in paragraph 1.5 we recommend adjusting SA Water's expenditure proposals in the following areas:

- ▶ **Adjustment of the timing of items of expenditure where there is sufficient evidence that the timing proposed by SA Water is unrealistic.**

In our review of capital expenditure we are recommending that the Aldinga WWTP project be deferred. Thus, we have made a downward adjustment to the operating expenditure consequences associated with this scheme of some \$0.4m per annum.

- ▶ **Adjustment of any top down factors applied to expenditure categories where we believe that the factors applied by SA Water is unreasonable.**

We recommend that the cost escalator assumptions related to labour, materials and contracted services be deleted. We do not take issue with the conclusions of the Evans and Peck Report related to operating cost escalators but in our view and based upon the experience we have seen elsewhere in the UK and for example, the regulatory framework in NSW, as administered by IPART, such escalators adjusted for CPI are viewed as wholly business risk issues. We think that real cost pressures related to labour, materials and contracted services will reflect the effective and prudent management by SA Water of its approach to procurement.

We are not recommending a specific adjustment to the electricity cost assumptions. We note that procurement of electricity for the Plan Period from June 2013 is at the early stages of approval. There will be uncertainty in relation to future electricity cost escalators given the volatility of the energy market. We have noted that the Company actively seeks to manage its electricity costs both operationally and in relation to tariffs. For the ADP project it has entered into a 20 year agreement with a supplier that provides for a level of certainty that is unusual in an industry in which electricity makes up a significant proportion of the cost base.

- ▶ **Efficiency**

As set out in Section 7.3, we propose continuing efficiency factors of 1%, 2% and 2% over the three year regulatory period.

Table 7-19 details our recommended prudent and efficient operating expenditure following the application of the adjustments and efficiency factors outlined above.

**Table 7-19 Recommended prudent and efficient operating expenditure**

\$M March 2012	2013/14	2014/15	2015/16
<b>Proposed operating expenditure</b>	483.5	469.4	465.8
<b>Expenditure adjustment</b>			
SA Water advice of 18/10/12 (Table 7-9)	-2.7	-1.5	-0.7

Deferral of Aldinga WWTP	-0.4	-0.4	-0.4
Cost escalator adjustment	-4.1	-6.5	-9.4
<b>Total - Adjusted proposed operating expenditure</b>	<b>476.3</b>	<b>461</b>	<b>455.3</b>
<b>Efficiency adjustment</b>			
Continuing efficiency	1.00%	2.00%	2.00%
Total cumulative efficiency	1.00%	2.98%	4.92%
Efficiency adjustment	-4.8	-13.7	-22.4
<b>Recommended efficient operating expenditure</b>	<b>471.5</b>	<b>447.3</b>	<b>432.9</b>
<b>Variance (recommended - proposed)</b>	<b>-12.0</b>	<b>-22.1</b>	<b>-32.9</b>
<b>Variance (%)</b>	<b>-2.5%</b>	<b>-4.7%</b>	<b>-7.1%</b>

## 8 Capital expenditure

### 8.1 Overview

SA Water's capital expenditure program over recent years has been dominated by construction of the Adelaide Desalination Plant. This \$1.8B project is due for practical completion at the end of 2012 with only expenditure on minor completion works in the review period. Total capital expenditure of \$1.1B is proposed by SA Water over the three year review period from 2013/14 to 2015/16.

ESCoSA requires us to review SA Water's proposed capital expenditure to assess whether the expenditure is prudent (required) and efficient (least cost). Where we consider expenditure to be not prudent and efficient, we are to recommend a prudent and efficient level of expenditure. Our methodology for testing prudence and efficiency is based on a review of SA Water's systems and processes complemented by a review of a sample of capital expenditure projects and programs. The findings from this review are set out in the following sections.

### 8.2 Proposed capital expenditure program

SA Water's proposed future capital expenditure program for the regulatory period is shown alongside actual capital expenditure for the preceding seven years in Figure 8-1. This data has been sourced from SA Water's Regulatory Business Plan. The expenditure for 2011/12 is forecast outturn. This figure shows the impact of the Adelaide Desalination Plant on the capital expenditure trend. Over the three year period from 2013/14 to 2015/16, \$1,100M of capital expenditure is proposed rising from \$357M in the first year to \$401M in the last.

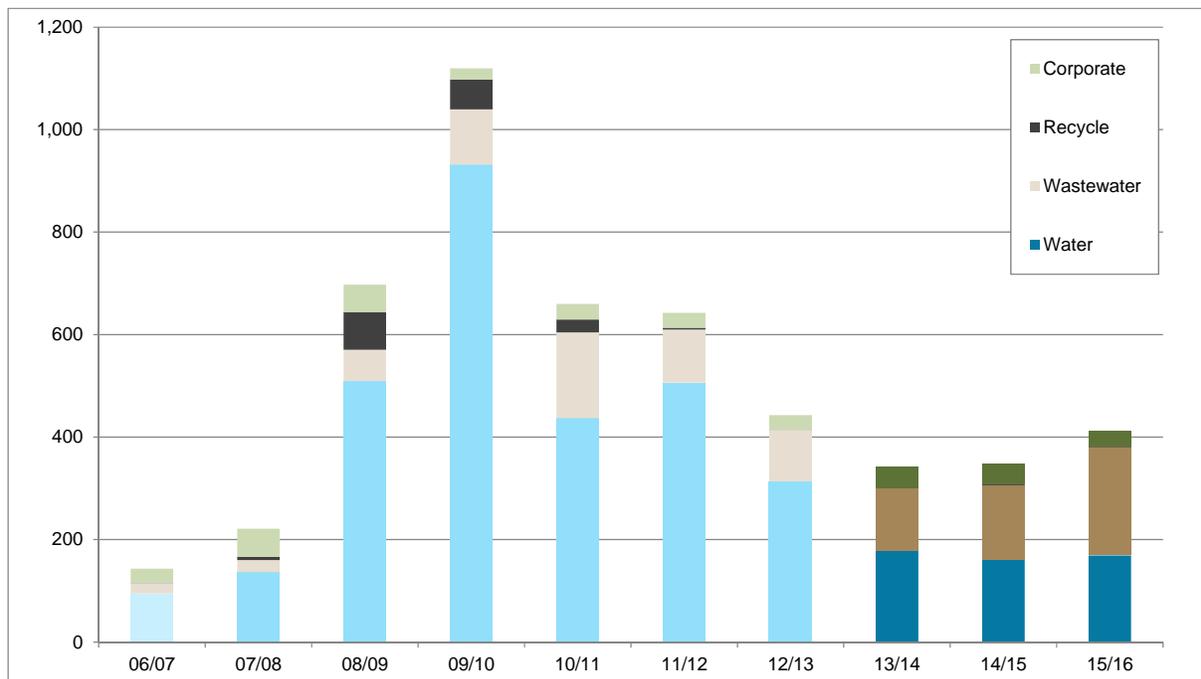


Figure 8-1 Capital expenditure 2006/07 - 2015/16

While capital expenditure in the regulatory period is low compared to expenditure in the preceding years, the earlier period has included construction of the ADP. When expenditure on the ADP is removed, the expenditure in the three year regulatory period is broadly in line with the three years since 2010/11. The magnitude of the program, and the profile, which has a small weighting towards the end of the program,

does not therefore raise any concerns over deliverability, given the robustness of the PMP model used by SA Water to deliver the majority of its program in the metropolitan area.

Proposed capital expenditure is fairly evenly distributed between the water service (46.1%) and the sewerage service (43.2%) as shown in Table 8-1<sup>21</sup>.

**Table 8-1 Capital expenditure by service**

Expenditure by service	Total capital expenditure 13/14 to 15/6	Proportion of total (%)
Water	509.0	46.1%
Wastewater	476.9	43.2%
Recycle	4.9	0.4%
Corporate	113.0	10.2%
<b>Total</b>	<b>1,103.6</b>	<b>100.0%</b>

Capital expenditure by driver (as detailed in Section 2.3) is summarised in Table 8-2. Asset renewal accounts for around half of all expenditure. System growth (22.1%) and external obligations (19.6%) are the next largest drivers. Drought response refers to expenditure to complete the Adelaide Desalination Plant.

**Table 8-2 Capital expenditure by driver**

Expenditure by service	Total capital expenditure 13/14 to 15/6	Proportion of total (%)
Asset Renewal	530.4	48.2%
External Obligations	216.0	19.6%
Corporate	70.1	6.4%
System Growth	243.0	22.1%
Other	17.5	1.6%
Drought Response	23.3	2.1%
<b>Total</b>	<b>1,103.6</b>	<b>100.0%</b>

SA Water's capital expenditure program is not overly dominated by large projects with only one project with expenditure over \$100M in the regulatory period and five over \$20M. The 15 projects with the highest capital expenditure over the regulatory period are summarised in Table 8-3. These projects have total proposed expenditure of \$405M over the regulatory period, accounting for around 40% of all expenditure. This demonstrates that the remaining 60% of the capital expenditure program is comprised of projects with total expenditure of less than \$6.0M across the three years.

**Table 8-3 15 largest capital expenditure projects by value**

Project	ID	Project Name	2013/14	2014/15	2015/16	Total (RBP)
C0387	1141	Murray Bridge WWTP Upgrade	8.0	19.2	80.0	107.2
C7431	435	Kangaroo Creek Dam Safety Investigation	4.0	35.0	35.5	74.5

<sup>21</sup> There is a minor difference in the total expenditure presented in this analysis and that presented previously (Approximately \$3M or 0.3% of the total over the period). This is because SA Water revised expenditure for a small number of projects compared with that included in the ESCoSA expenditure template but did not provide an update of the breakdown by service in the template. These differences are important for the individual projects but not at the aggregate level. For analysis at the aggregate level, we have used both the revised expenditure where possible but in some instances use the original expenditure totals.

Project	ID	Project Name	2013/14	2014/15	2015/16	Total (RBP)
C1467	4328	Bolivar Pre-aeration concrete rehab	1.4	12.7	21.0	35.0
C1709	3065	Aldinga WWTP - Capacity Upgrade Stage 2	1.3	15.0	18.5	34.8
C8000	4719	Adelaide Desalination Plant.	9.1	14.2	-	23.3
C8917	7097	Mt Barker Water Supply Investigation	16.2	2.8	-	19.0
C5884	1559	GWWTP Complete Upgrade of Inlet Screens	1.5	6.0	10.3	17.8
C1336	2896	North Lefevre Peninsula WW Diversion	1.5	1.5	13.7	16.7
C0513	3807	Plympton - Marion Rd Trunk WM Renewal	14.4	-	-	14.4
C8376	723	CBWWTP Capacity Upgrade	14.4	-	-	14.4
C1902	5938	SCADA Replace Metro/Outer Metro RTUs	2.0	6.0	6.3	14.3
C0069	1432	Happy Val WTP Upgrade Chlorine Station	8.9	2.5	-	11.4
C5891	1582	Hendon Upgrade Queensbury WWPS	9.3	0.5	-	9.8
C2282	5827	Kingscote Water Supply - Treated Storage	6.1	1.0	0.2	7.3
C1746	6180	Bolivar WWTP Clarifier Upgrade Stage 3	0.5	0.5	5.0	6.0

We have examined a number of these projects in detail as part of our review of a sample of projects. The findings from this review are presented in Section 8.4. Given that a large proportion of the total proposed expenditure is contributed by small projects, mostly driven by renewal, we have also considered the processes for developing renewals expenditure to inform our conclusions around prudent and efficient expenditure.

### 8.3 Capital cost escalation

As noted in Section 7.3, ESCoSA has to decide whether to allow for increases in real costs over and above the level of consumer inflation allowed for in its CPI-x regulatory model. CPI, as a measure of general inflation, does not directly measure the change in the cost of capital expenditure. However, CPI has a number of positive features such as transparency, independent calculation, and difficulty in manipulation that make it favoured by economic regulators. Consumer inflation over the medium to long term is also in general a reasonable measure of input prices which might show significant fluctuation in the short term.

As noted in Section 1.6, SA Water has presented its forward capital expenditure forecasts in constant prices at a March 2012 base, other than for committed capital expenditure projects (c.\$50M), which have been presented in nominal dollars. SA Water, in its submission, has also proposed escalation factors for real costs increases over the regulatory period.

These real cost escalators have been determined by Evans and Peck. The methodology employed by them was to first forecast future demand for construction services in South Australia. An increasing demand would likely lead to increasing real cost pressures and conversely, lower demand would likely lead to decreasing real cost pressures. This review of construction demand concluded that "South Australia's economic growth over the next 5 years is expected to stay close to its average for the past 5 years"<sup>22</sup>.

We note that Evans and Peck has assumed that the supply side for construction services will remain unchanged over the analysis period. We believe that the supply of construction services in South Australia is linked to the national market for construction services and supply will increase when there is decreased demand across Australia and vice versa.

<sup>22</sup> Evans & Pecks, SA Water Corporation Review of Indexation Rates for Capital Works associated with the Regulatory Business Proposal, 12 June 2012, p. 14.

The next step undertaken to determine real cost escalation factors was to analyse the forward capital works program to identify the different categories of work to be undertaken. For each work category, a typical input 'basket of goods' of internal labour, materials and contracted services was determined. The materials included in the 'basket' were ready mixed concrete, plastic and steel pipes, structural steel, electrical equipment and pumps. Weights for each input were determined.

For each of the inputs, Evans and Peck identified an appropriate price index that measured historical movement in the cost of that input. The price indices selected are compiled by the Australian Bureau of Statistics, and are publically available. To forecast how these historical indices would move in future, Evans and Peck drew on its first item of investigation which concluded that the future five years would be similar to the 5 years past. That is, the historical movement in each of the price indices would be a good indicator of their future movement. A probabilistic method was then used to quantify what the likely movements in future years would be. Table 8-4 details the input cost escalation factors determined by this approach.

**Table 8-4 Forecast of real input cost escalation for capital expenditure**

	2012-13	2013-14	2014-15	2015-16
Labour (%)	1.66	1.70	1.74	1.77
Materials (%)	1.41	1.55	1.70	1.84
Contracted Services (%)	1.37	1.46	1.56	1.64

The real cost escalators were then applied to the weighted volume of forward capital expenditure to determine the magnitude of real cost increases over and above inflation, as measured by the consumer price index. These real cost increases total \$49M over the regulatory period.

We believe that the methodology presented for determining real cost escalation is sound. It also has the benefit of using publically available price indices which increases the transparency of the assumptions.

However, we believe that the assumption that economic growth, which is a proxy for construction demand, will be similar over the next 5 years compared to the previous 5 years requires further analysis. The Australian Bureau of Statistics estimates that value of building work completed in each State and territory for both the private and public sectors<sup>23</sup>. Figure 8-2 presents the total value of building work done in South Australia over the previous ten years. This shows that while building work steadily increased until the end of 2009, it has since declined significantly<sup>24</sup>.

Another forecast of future economic activity, and hence construction demand is through the State Government budget. The 2012/13 budget was published in May 2012<sup>25</sup> and includes forecasts for the rate of growth in Gross State Product and State Final Demand. Over the period 2013/14 to 2015/16, both these indicators are projected to increase at a rate between 3-3.5% per annum which is higher than the growth rate predicted for Australian Gross Domestic Product of 3% per annum over the same period.

<sup>23</sup> Series 8755.0, Table 05. Value of Building Work Done, Chain Volume Measures, States and Territories, Seasonally Adjusted.

<sup>24</sup> Note that the chain volume measure has been used. This adjusts for changes in prices so that it can better measure volume changes. This makes it a better measure of underlying demand than an index that presents costs only.

<sup>25</sup> Available online at: [http://servicesa.cdn.on.net/documents/bp3\\_budget\\_statement\\_2012-13.pdf](http://servicesa.cdn.on.net/documents/bp3_budget_statement_2012-13.pdf)

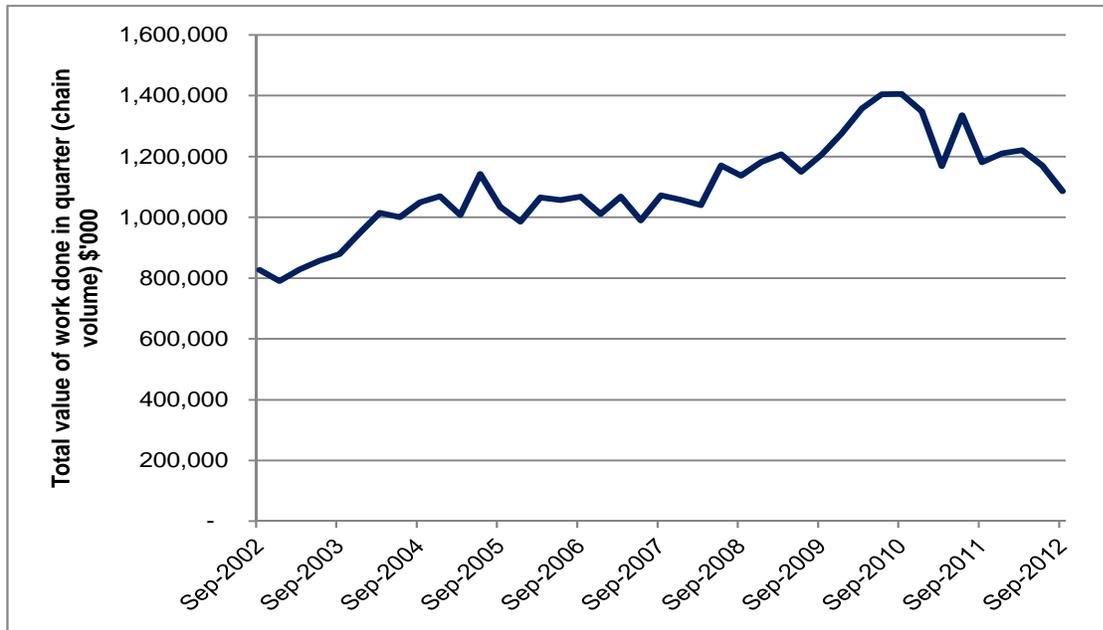


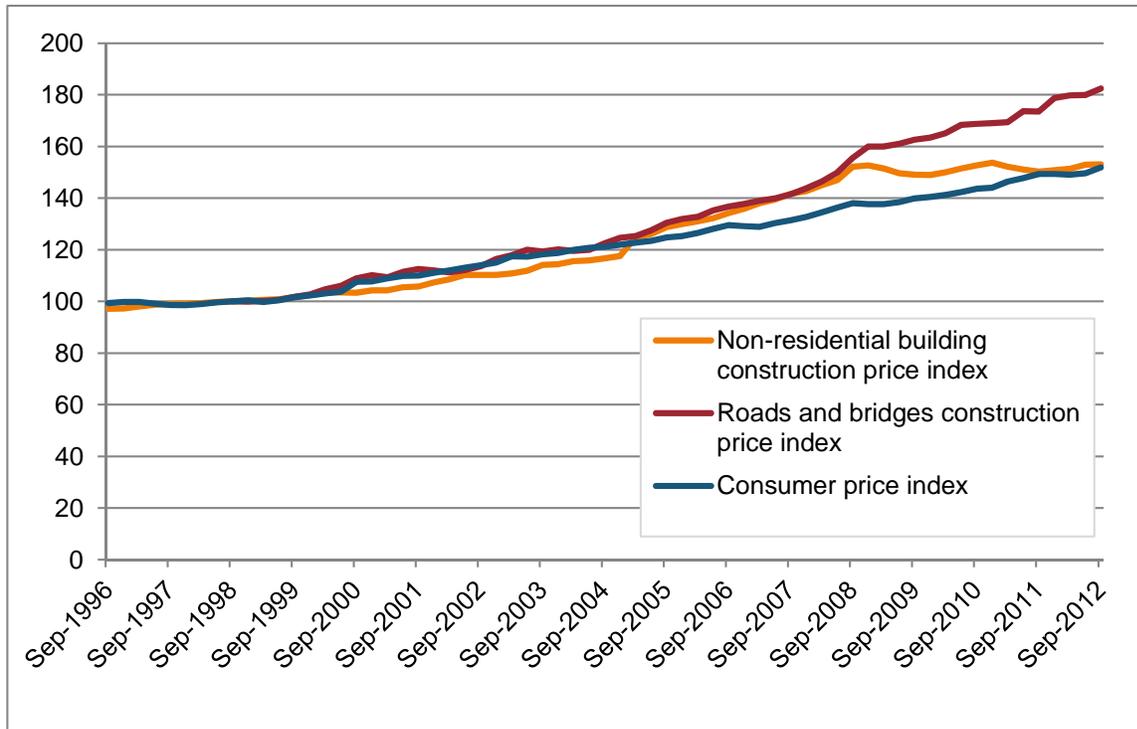
Figure 8-2 Value total building work done in South Australia by quarter (Chain volume measure)

However, it is important to note that the State Budget forecasts make allowance for the planned expansion of the Olympic Dam mine by BHP Billiton. This project has expected capital expenditure of around \$20B, however it was deferred by BHP Billiton in August 2012. A recent economic survey<sup>26</sup> suggests that planned investment in South Australia has declined from \$51.2B in June 2012 to \$28.7B in September 2012 almost entirely due to the cancellation of this project.

An alternative perspective is given by reviewing the historical movement in relevant construction output price indices. The two publically available series most relevant to the water industry are for non-residential building construction and roads and bridges construction. The trend in these series since September 1996 (when the non-residential building construction price index was first published) is shown in Figure 8-3<sup>27</sup>.

<sup>26</sup> Deloitte Access Economics, Investment Monitor, November 2012

<sup>27</sup> For all indices, September 1998 = 100. This is when the Roads and bridges construction index was first published



**Figure 8-3 Non-residential building construction, Roads and bridges construction and Consumer Price Indices**

Over this period, the non-residential building construction price index has matched the consumer price index although it exceeded this measure for the period from 2004 to 2011. The roads and bridges construction price index matched the consumer price index until the end of 2004. From this time, it has significantly exceeded the other two price indices.

The period from 2001 to 2009 is recognised as one of the longest periods of continuous economic growth in Australia (and worldwide) since inflation targeting by the Reserve Bank of Australia commenced. Also, in the second half of the last decade a number of large water security of supply projects were undertaken across Australia. These two factors suggest that the construction cost increases observed over this period are likely to be higher, and possibly significantly higher, than a similar length of time into the future.

We acknowledge that there is evidence to suggest that construction costs in South Australia in the period to 2015/16 will experience real cost increases comparable to that seen over the last 5 years. However, we believe that, on the balance of probability construction costs will respond to the highly significant deferral of the Olympic Dam expansion project; noting that this deferral has almost halved total construction demand in the state.

In line with the recommendation we have made for operating costs, we recommend that no real cost escalation be allowed for SA Water’s capital costs for the following reasons:

- ▶ There is no evidence of the South Australian or Australian market for construction is in a state of high growth that could lead construction prices significantly exceeding their long term trend to broadly follow general inflation.
- ▶ Allowing real costs escalation for capital costs above CPI would weaken the incentives inherent in CPI-x inflation to generate cost savings.

We also note that this view is in line with that taken by other regulators across Australia<sup>28</sup>.

## 8.4 Findings from review of sample of capital expenditure projects

We examined a sample of capital expenditure projects and programs in detail to inform our judgement for this review. The projects and programs were selected in conjunction with SA Water and are listed in Table 8-5.

Table 8-5 Sample of capital expenditure projects reviewed

Project Number	Project / program name	Driver	Expend. 13/14-15/16 (\$M)
	Capability Management	Asset renewal – Other	29.919
C5891	Hendon Upgrade Queensbury WWPS	Renewal – M&E Equipment	9.800
C0069	Happy Val WTP Upgrade Chlorine Station	Renewal – M&E Equipment	11.426
	M & E Plant Renewal - Treatment Plants	Renewal – M&E Equipment	53.464
	M & E Plant Renewal - Networks	Renewal – M&E Equipment	45.198
	Water Network Reticulation Mains Renewal	Asset renewal – Pipe Networks	67.393
C1467	Bolivar Pre-aeration concrete rehab	Asset renewal – Structures	34.973
	Structures Renewal - Networks	Asset renewal – Structures	27.750
C7431	Kangaroo Creek Dam Safety Investigation	Safety	74.500
	Occupational Health & Safety Improvement	Safety	37.967
	Water Quality - Network	Water quality management	18.614
	Business Application Risk	IT	16.040
C8917	Mt Barker Water Supply Investigation	Networks growth	18.962
C0387	Murray Bridge WWTP Upgrade	Treatment plant growth	107.208
C1709	Aldinga WWTP - Capacity Upgrade Stage 2	Treatment plant growth	34.750

A summary of our findings regarding each project or program has been included in Appendix A and summarised following.

### **Capability Management**

Part of the Service Reliability Management strategy, the Capability Management Asset Program is to provide infrastructure that is able to: maintain the capability of providing existing levels of service to customers by reacting efficiently and effectively to changes in regulatory requirements that require equipment upgrades; maintain reliability of infrastructure outputs within a changing operating environment; and to reduce high risks identified at treatment plants, major pipelines and networks to enable service standards to be maintained. In general, this comprises a significant number of relatively small projects.

For the period 2006/7 to 2012/13 the average level of expenditure on the Capability Management was \$9.60m/year (when the GWWTP is removed). The proposed level of spend for the coming RBP period is \$9.97m/year. This program of work appears to be a consistent level of spend.

Although beyond the scope of this review, we note that the projected figures show expenditure averaging \$34.1m/year for the 2nd RBP 4 year period from 2016/7 to 2019/20. It is not clear how much of the future Capability Management expenditure is influenced by larger projects like the GWWTP scheme.

<sup>28</sup> See for example IPART's "Review of prices for water, sewerage, stormwater and other services for Hunter Water Corporation", 2009, page 235.

### ***C5891 - Hendon Upgrade Queensbury WWPS***

This 1935 (1966/7 refurb) sewage pumping station is classed as “the most critical in the state”, serves a population of 40-50,000 and pumps into the Bolivar Trunk Sewer. SA Water has concerns about: the age and condition of the assets; access to the pumps; the condition of the wet well; the danger of flooding of electrical equipment in the event of failure; and odour (40 complaints in 10 years).

The estimate for the work was in the design report and cost estimate was \$14.2m including 15% contingency (April 2011). ESCOSA reviewed the project in December 2011 and reduced the approval for the project from \$19.2m to \$17.2m. Before going for FFA in May 2012, detailed design and estimates were prepared.

The FFA figure of \$18.04m includes an escalator of \$0.9m. The contract is going to tender around the time of this report. It is understood that it is known that inflation may be negligible or even negative at the current time. The application of escalation is, however, within treasury rules.

The contingency represents 15.8% of likely project costs. This figure seems high insofar as detailed design and costing has been carried out and the project is located within a known boundary with limited scope for unforeseen circumstances. We believe that the project is justified, but that the contingencies should be halved, reducing the FFA figure by \$0.7m (0.4%) to \$17.34m<sup>29</sup>.

### ***C0069 - Happy Valley WTP Upgrade Chlorine Station***

Part of SA Water's core business is to provide a suitable process for: complying with Australian standards mainly AS2927: 2001 'The Storage and Handling of Liquefied Chlorine Gas'; producing drinking water in accordance with ADWG; to provide a safe working environment at the treatment plant and ensure compliance with the Occupational Health Safety and Welfare regulations; and to contain chemicals within the process without contaminating the surrounding environment.

This project has \$11.426M of expenditure proposed during the RBP period. Appropriate options were considered and the selected replacement option was the only one that didn't carry extreme risks. The job appears to be essential and should probably have been done previously due to the health and safety imperatives involved.

The job was tendered and awarded (fixed price) for \$11.6m. It is not clear why the figures in the capital expenditure tables are not reflective of the tender price (total expenditure in tables of \$17.848M). This project provides an example of where estimates are likely to be higher than tender return due to the current downturn in the economy.

### ***M & E Plant Renewal - Treatment Plants***

This program of work is for works to maintain asset reliability of mechanical and electrical infrastructure in Water and Wastewater Treatment Plants at the lowest cost and acceptable level of risk over the lifetime of the asset. It also covers work to achieve efficient and effective performance of the assets, to maintain the levels of service stated in the SA Water Customer Charter, to address external stakeholder requirements and to ensure compliance with all relevant regulatory requirements. The SAW RBP 2013 comprises 50 individual projects with expenditure in the RBP period (29 wastewater for \$34.5M, 21 water for \$18.9M).

Based upon the Asset Audit Trail documents provided for water treatment, the breakdown of large and small plants and the %age of M&E assets therein, the proposed rate of spend (excluding the proposed work at Happy Valley WTW) would equate to an asset life of approximately 35 years. We believe this is a reasonable (or even low) spend in the longer term.

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<sup>29</sup> Note that that the FFA figure does not exactly align with the expenditure profile in SA Water's capital expenditure model due to other sunk costs.

Based upon the Asset Audit Trail documents provided for wastewater treatment, the breakdown of metro and country plants and the %age of M&E assets therein, the proposed rate of spend (excluding the current work at Bolivar WWTP Main PS and proposed work at GWWTP and BWWT) would equate to an asset life of approximately 28 years. We believe this is a reasonable (or even low) spend in the longer term.

The expenditure level on M&E Plant Renewal – Treatment Plants for the 7 years prior to 2013/14 is \$12.2M/year (including all schemes) compared with \$21.9M/year during the RBP period. When only projects <\$4M are considered, the equivalent figures are \$6.2M/year and \$17.8M/year.

We believe it implausible that the need for M&E Plant Renewal at treatment works should be accelerating at the rate indicated by the spend profile. While we have not considered the detail of every project included in the program, we accept that the company is taking a more rigorous approach to capital maintenance planning and there may be an element of backlog expenditure required, a level of spend much beyond the program level would be difficult to justify. With the advent of asset management information gathering enhancements, it is likely that a more robust case could be made beyond the RBP period. We do not see a robust case for a threefold increase in spend for the regulatory period and propose that a 10% (\$5.3M) reduction in the program for M&E Plant Renewal – Treatment Plants over the regulatory period.

### ***M & E Plant Renewal - Networks***

This program of work is for works to maintain asset reliability of mechanical and electrical infrastructure in Water and Wastewater Networks at the lowest cost and acceptable level of risk over the lifetime of the assets. It also covers work to achieve efficient and effective performance of the assets, to maintain the levels of service stated in the SA Water Customer Charter, and to ensure compliance with all relevant regulatory requirements. The SAW RBP 2013 comprises 16 individual projects with expenditure in the RBP period (8 wastewater for \$24.8M, 8 water for \$20.4M).

While we accept that there has been analysis of criticality and Nessie modelling, there is a lack of evidence that the anticipated catastrophic and extreme events have been occurring in recent years. We would expect with a large asset stock there to be some linkage between outturn and forecast performance. We accept that it is probable that current and historic expenditure levels are unsustainable. However, we do not see a case for a fourfold increase in spend and propose a 20% (\$9.04M) reduction in the program for M&E Plant Renewal – Networks over the regulatory period.

### ***Water Network Reticulation Mains Renewal***

The objective of the Water Reticulation Network Management Program is to manage Reticulation Mains across the state, to consistently meet the required standard of service and asset reliability at the lowest cost and acceptable level of risk. This objective is in direct alignment with, and helps to deliver, the SA Water Corporate Strategic Plan and Draft Asset Management Policy.

SA Water has almost 23,000 km of water mains (including fire services) across the metropolitan and country regions. This program covers Reticulation mains (diameter <375mm). Reticulation mains comprise 86% by length of all water mains in the state. With a 2011/12 replacement value of \$6,800m, this makes water reticulation mains the single biggest class of assets both in terms of size and replacement value. In terms of length of mains installed, approximately 64% of reticulation mains were constructed more than 50 years ago, 32% are more than 80 years old, and 14% are more than 100 years old and, hence, approaching the end of their estimated asset life. Over 47% of reticulation mains are of asbestos cement (AC) construction, with 28% cast iron (CI, CICL or CICS), and 9% poly vinyl chloride (PVC). Other pipe material types include ductile iron concrete lined (DICL), mild steel concrete lined (MSCL), and polyethylene (PE), as well as several other less commonly used materials making up the remainder of the reticulation network.

We saw in practice the means by which SA Water selects reticulation mains for renewal. The approach aligned with good practice we have seen elsewhere. The expenditure proposals compared to the asset base

imply an asset life of 380 years and while this work shows an increasing trend, our observation is that the work is well targeted and should remain at the proposed expenditure level.

#### ***C1467 - Bolivar Pre-aeration concrete rehab***

Pre-aeration tanks were constructed at Bolivar WWTP (the main Adelaide treatment plant) in 1963 and are below ground reinforced concrete. In 2001, fibreglass covers were fitted as part of the Bolivar odour control project. In 2005, SA Water's Material Sciences Group reported severe corrosion of the concrete in BWWTP pre-aeration tanks. Areas of concrete above the normal waterline have been affected by sewer gas (hydrogen sulphide) which has attacked the concrete.

The existing process, pre-aeration grit removal, is not considered to be in line with current industry standards. This project is a key part of a strategy to delay a capacity upgrade of the treatment plant until 2040. The works comprise the repair of the concrete, with improvements to the process where appropriate.

There was considerable documentation showing the extent to which the long term future of the works, the processes used, and the current condition has been considered, and optioneering carried out. With the established contractor involvement, and the relative maturity of the project, we see no specific reason to reduce the capital expenditure below the proposed level of \$35.0M over the review period.

#### ***Structures Renewal - Networks***

The Structures Renewal – Networks program is to manage structures within water and wastewater networks, to meet required standards of service, asset reliability, and structural integrity, at the lowest cost and acceptable level of risk, over the lifetime of the assets. Further, the program aims to effectively manage structures so that they provide water and wastewater services that are fit for purpose, cost effective, and comply with regulatory requirements.

The program includes all structures in the water and wastewater networks, including pumping stations ( both above and below ground), storage tanks, chemical dosing stations and valve chambers.

The water network asset base comprises: 469 Water Pumping Stations (94 metro); 769 Water Storage Tanks; 34 Earth Bank Storages, (consolidated listing state-wide); 142 Water Dosing Stations (4 metro); 131 Bores – not including the 46 on Eyre; and other associated asset classes including Valve Chambers, Buildings, Tunnels/Culverts, Energy Dissipaters, Above Ground Pipeline Trestles & Anchor Blocks, Roadways, Footpaths, and Drainage.

The wastewater network asset base comprises: 565 Wastewater Pumping Stations (331 metro); and other associated asset classes including Chamber Structures, Ventilation Systems, Buildings, and Roadways, Footpaths and Drainage.

Based on our analysis, it is probable that current and historic expenditure levels are unsustainable, and the RBP shows a significant increase in expenditure. However, we do not see a robust case for a threefold increase in spend, and propose a 10% (\$2.8M) reduction in the program for Structures Renewal – Networks over the regulatory period.

#### ***C7431 - Kangaroo Creek Dam Safety Investigation***

The works are required to provide additional flood capacity to meet modern dam safety requirements and are estimated to cost \$79.9M (of which \$74.5M is proposed to occur in the regulatory period). The dam spillway must have the capacity to pass the Probable Maximum Flood (PMF) without failing, whereas the spillway only has the capacity to pass floods with annual return periods of between 1 in 60,000 and 1 in 115,000 years. The required spillway capacity is 6,000 m<sup>3</sup>/s. The current capacity is only 1,500 m<sup>3</sup>/s.

There is no specific dam safety regulation in South Australia. SA Water is self-regulated for dam safety. The SA Water Board has endorsed use of the Australian National Committee on Large Dams (ANCOLD) guidelines for the assessment of dam safety. Use of the dam safety guidelines is consistent with practice elsewhere in Australia.

The population at risk from failure of Kangaroo Creek Dam is around 100,000. Estimates of the potential loss of life from failure of Kangaroo Creek Dam range from 157 to 1,476 depending on the type of failure (sunny day at the low end, PMF at the high end). Based on these estimates, the cost per life is between \$50k and \$500k. According to the guidelines, there is Very Strong justification for undertaking works if the cost of the works is less than \$1.5M per life saved. By comparison the Queensland dam safety management regulations specify that works are justified if the cost per life saved is less than \$5M. The works would be justified in Queensland even if they were almost ten times more expensive, everything else being equal.

We believe that there is strong justification for these works and they are therefore prudent. We have reviewed SA Water's cost estimate and believe it is reasonable. It includes a contingency of 30% which is appropriate as the geological investigation undertaken to date has been only a desktop review and limited sampling.

### **Occupational Health & Safety Improvement**

The occupational health and safety improvement program totals \$38M over three years. The three largest sub-programs of work comprise around half of all expenditure and are:

- ▶ Relocate WWPS off-road (\$11.80M).
- ▶ Improve tank access (\$4.80M).
- ▶ Improve below ground valve access (\$3.15M).

The other half of the total program expenditure is for other sub-programs of work to address issues such as asbestos, fire detection, fall prevention and valve access.

We reviewed the proposed expenditure for relocating WWPS, improving tank access and valve access in detail. We found that both were ongoing programs to address health and safety risks that had been identified by SA Water some years ago through high level risk assessment. We reviewed the risk assessment and prioritisation for each and found them to be sound. The risk assessment has considered risk factors specific to the situation, e.g. pipe diameter for below ground valve access and tank height for tank access.

We believe that the prioritisation of these sub-programs of works by SA Water has led to lower costs than if it undertook all of the works in a shorter period of time. Given the risks identified, we believe that SA Water would have been justified to complete the works sooner than planned. This demonstrates that SA Water as an organisation is willing to balance risk and cost in delivering its services.

The costs for these programs are based on historical costs as the programs have been underway for a number of years. We noted that the costs may understate the full cost of the works as on-costs had not been determined consistently.

### **Water Quality - Network**

This expenditure item is a program of works aimed at improving water quality in SA Water's distribution network. Of the \$18.6M in total expenditure planned, \$16.5M is for undefined 'funding lines' - \$10.5M for county areas, \$6M for metropolitan areas. The largest defined item is \$1.65M to improve water quality at Naracoorte.

SA Water informed us that the scope for this program of works had been established through a risk assessment across its 79 water supply systems. The risk assessment considered 10 water quality risks

relating to disinfection efficacy and disinfection by-products. SA Water is required under the *Water Act* to take a risk based, multi-barrier approach to managing water quality.

SA Water has had an ongoing program for a number of years to address these risks dealing with the highest risks first. The funding lines are a continuation of this program. The works to be completed for example include installing disinfection at booster stations and modifying storage pipework to prevent short-circuiting. The costing for these works is based on historical costs of the program.

We found that there is a clear need for these works based on SA Water's risk assessment in line with its obligations under legislation. We believe that the costs proposed are reasonable as they are based on recent experience with these activities.

### ***Business Application Risk***

Expenditure of \$16M is proposed by SA Water for this program which is primarily aimed at renewing and upgrading SA Water's core information systems to manage its business risk.

We discussed the two largest expenditure items with SA Water – Financial reporting improvements (\$1.5M) and Migration of the corporate internet site (\$1.4M). We found that these two projects lacked the rigorous justification we had seen for other items of capital expenditure and found that the supporting information tended to focus on the 'solution' rather than the 'need'.

After considering the available information, we believe that although not clearly articulated, there is a need for the proposed expenditure in this area. We are however, surprised that SA Water does not consider that this expenditure will lead to operating cost efficiencies. We have accordingly made allowance for this expenditure to generate cost savings in the determination of the efficiency factor we propose be applied to operating expenditure (see Section 7.3).

### ***C8917 - Mt Barker Water Supply Investigation***

This project is to provide water supply infrastructure to new development areas in Mt Barker. Mt Barker is in the Adelaide Hills and is in commuting distance to Adelaide so has been identified by the State Government as a location for accommodating future growth. Wastewater services in Mt Barker are currently supplied by the local government. There is possibility that SA Water may take on this responsibility as the development proceeds. No expenditure has been included by SA Water in its proposal for this possibility.

SA Water has submitted a revised estimate of costs during the regulatory period of \$19.0M down from \$32.2M in the original submission. This reflects a lower than anticipated rate of development in the area. There is limited coordination over land releases for development in South Australia and SA Water may have to provide services to multiple developers across multiple growth fronts in Mt Barker. This is very likely to lead to sub-optimal provision of infrastructure in this development compared to if land releases were more coordinated.

SA Water has engaged in an early contractor involvement process so that it can capitalise on innovative ideas that may exist in the market. This process has identified alternative infrastructure routing options not previously considered by SA Water that are lower cost than initial estimates.

We are satisfied that there is a need to provide infrastructure by SA Water and that it is planning the nature of the infrastructure provided to the extent possible.

### ***C0387 - Murray Bridge WWTP Upgrade***

SA Water has proposed to invest \$188M (\$107M in the review period) to upgrade the Murray Bridge wastewater treatment plant. Construction is proposed to commence in 2014/15 and be completed by 2017/18. SA Water notes the following drivers for this work:

- ▶ Growth – the current plant is estimated to be subject to loading of 20,000 EP compared to a design capacity of 12,000EP.
- ▶ Odour complaints from neighbouring properties.
- ▶ Flood risk – the plant is below the 1956 flood level which is seen as a benchmark for planning.

The impacts of growth are typically seen in deteriorating effluent quality. However, all the effluent from this plant is reused at either a piggery or in a wetland owned by the Department of Defence. We queried whether the end users had expressed concern that the effluent provided was not fit for purpose. SA Water responded that other than for short term quality issues, the end users were satisfied with the effluent quality. As this is a lagoon treatment plant, overloading would result in an increased need for desludging the lagoons and increased risk of the lagoons becoming anaerobic. We were informed that the lagoons are on a 3 year desludging cycle and that the next desludging will be undertaken at 3 years as planned. This does not indicate significantly deteriorating plant performance. Therefore, we do not believe that there is a need to upgrade this plant currently based on plant performance due to loading.

SA Water informed us that it had received only 16 odour complaints relating to this site in 7 years (6 recorded by the EPA and 10 recorded by SA Water). We believe that this is a very low rate of complaints and insufficient to drive upgrade works. SA Water did not provide any results of odour monitoring or modelling for the site.

SA Water does not have formal standards for protection of assets from flood risk. The 1956 flood is considered the largest ever flood in South Australia's European history. Without reference to a standard for protection and the return period of the flood, it is difficult to consider that the works are required on this basis.

We do not accept that expenditure is justified at this site in the timeframe proposed by SA Water. We therefore propose that this project be deferred outside of the regulatory period.

### **Aldinga WWTP - Capacity Upgrade Stage 2**

SA Water informed us that following completion of its regulatory submission, that it has received more recent information that indicates that the rate of growth in the treatment plant catchment has slowed considerably. Consequently, SA Water has now proposed to defer this project by two years. Only investigation work will be undertaken in the regulatory period. SA Water considers that \$1.75M for investigation and design work will be required between 2013/14 and 2015/16.

## **8.5 Efficiency**

Our methodology for determining efficient capital expenditure applies the concept of a frontier company to determine the scope for SA Water to achieve continuing and catch-up efficiencies over the review period.

We recommend that a continuing efficiency target of 0.5% per annum be applied to SA Water's capital costs in line with the continuing efficiency applied to the United Kingdom water businesses. This efficiency factor was determined through a study<sup>30</sup> by Reckon LLP which concluded that:

*We forecast a growth rate for both water and sewerage of -0.5 per cent per year relative to the RPI. This forecast is for changes in unit capital costs. These are the changes attributable to productivity growth and to changes in input prices relative to the RPI, excluding any changes attributable to changes in the nature, quantity or quality of the capital outputs delivered by the capital program.*

We have noted in our review a number of areas where we believe that SA Water can more efficiently deliver its proposed capital expenditure by improving its business practices. These opportunities include:

- ▶ The taking back of the asset management functions for metropolitan assets which will allow SA Water to better understand its asset and their needs for renewal and replacement.

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<sup>30</sup> PR09 Scope for Efficiency Studies, Reckon LLP, October 2008, p165.

- ▶ Improving the depth of asset information held in Maximo to allow SA Water to undertake more quickly, and more fully, appraisal of needs identified for further investigation.
- ▶ More rigorous treatment of cost contingencies including setting out specific guidelines for their incorporation in cost estimates, monitoring them at a program level and moving to a risk based approach to estimating contingencies.
- ▶ Adopting a higher level, portfolio approach to managing and delivering the capital works program. This may identify opportunities to achieve the outcomes desired from the capital works program at a lower cost. We appreciate that SA Water is already moving in this direction.

We have also noted in Section 6.4 that we believe that the governance framework for capital expenditure that SA Water is subject to is creating inefficiencies. However, as this framework is out of the control of the organisation, we have not factored improvements in this area into calculation of our proposed efficiency factors.

We have to make a judgement on efficiency based upon the evidence we have seen at SA Water and in our experience elsewhere. We note that SA Water has a well-developed framework for developing, approving and delivering capital expenditure and that aside from the two growth projects we propose to defer, that SA Water has proposed a capital expenditure program that reflects a constrained approach to expenditure. In some instances, we are surprised that expenditure was not made earlier. However, as noted above, there are areas for improvement. On this basis, we recommend that an annual catch-up efficiency adjustment of 0.15% for each of the four opportunity areas outlined above be made, totalling 0.6% per annum. The proposed catch-up efficiency factors are shown in Table 8-6.

**Table 8-6 Proposed catch-up efficiency factors for capital expenditure**

	2013/14	2014/15	2015/16
Catch-up efficiency factor	0.6%	0.6%	0.6%

We note that SA Water has already committed to some of the expenditure proposed in its regulatory submission. This expenditure totals \$50.6M across the three years. As this expenditure is already committed to, we propose that the continuing and catch-up efficiency factors are not applied to this amount.

## 8.6 Recommended prudent and efficient capital expenditure

Consistent with our review methodology as set out in Section 1.5 we recommend adjusting SA Water’s expenditure proposals in the following areas:

- ▶ **Adjustments for better information provided by SA Water**

SA Water advised us of two areas that impact on its original submission and that we have taken into account in reaching our recommended level of capital expenditure:

1. It has already committed to around \$50M worth of capital expenditure. However, this expenditure is expressed in outturn prices. We have adjusted these costs to the common price base of March 2012, reducing the proposed capital expenditure by \$2.3M.
2. Since the time of finalising its submission, SA Water has continued to develop its capital expenditure projects. As a result, the proposed costs for some projects have now changed. While there is significant variance for some individual projects, the overall impact is a reduction in proposed capital expenditure of \$1.8M.

- ▶ **Adjustment of the timing of items of expenditure where there is sufficient evidence that the timing proposed by SA Water is unrealistic.**

We found insufficient evidence to support the proposed timing of the upgrade to the Murray Bridge WWTP and recommend that this expenditure be deferred beyond the regulatory period. \$107M of expenditure had been included in the regulatory period for this project. We have made allowance for only some investigation costs (\$1.75M).

SA Water submitted at our review that the proposed capital works to Aldinga WWTP should be deferred following an updated review of inflow volumes. We have therefore removed the capital expenditure relating to these works from the recommend expenditure (\$34.8M) but we have made allowance for only some investigation costs (\$1.75M).

We found that the contingencies allowed for the Hendon Queensbury PS upgrade were excessive given that the solution is well developed. We recommend that the contingencies be halved, reducing the allowed expenditure by \$0.7M

SA Water has proposed expenditure for M&E plant renewal at treatment plants that is three times greater than historic levels. We cannot see that this is justified given current performance and recommend that this expenditure be reduced by 10% (\$5.3M).

SA Water has proposed expenditure for the regulatory period on M&E plant renewal –networks four times higher than historic levels. We cannot see that this is justified given current performance and recommend that this expenditure be reduced by 20% (\$9.04M).

SA Water has proposed expenditure for the regulatory period on structures renewal –networks three times higher than historic levels. We cannot see that this is justified given current performance and recommend that this expenditure be reduced by 10% (\$2.8M).

▶ **Adjustment of any top down factors applied to expenditure categories where we believe that the factors applied by SA Water are unreasonable.**

As set out in Section 8.3, we recommend that no real cost escalation be applied to SA Water's proposed capital expenditure

▶ **Efficiency**

As set out in Section 8.5, we propose that SA Water's proposed capital expenditure be subject to a continuing efficiency target of 0.5% per annum and a catch-up efficiency target of 0.6% per annum.

Table 8-7 details our recommended prudent and efficient capital expenditure following the application of the adjustments and efficiency factors outlined above.

Table 8-7 Recommended prudent and efficient capital expenditure

	\$M March 2012	2013/14	2014/15	2015/16	Total
<b>Proposed capital expenditure</b>		342.5	348.9	412.3	1103.6
<b>Adjust committed projects back to \$Mar12 price base</b>		-1.9	-0.4	-0.1	-2.3
<b>SA Water High Level adjustment to project costs</b>		-0.7	8.3	-9.4	-1.8
<b>Expenditure adjustment</b>					
Deferral of Murray Bridge WWTP		-7.8	-19.0	-78.8	-105.5
Deferral of Aldinga WWTP		-1.0	-14.8	-17.3	-33.0
Reduced contingency on Hendon Upgrade		-0.7	0.0	0.0	-0.7
Reduced M&E Plant Renewal – Treatment Plants (10%)		-1.3	-1.8	-2.2	-5.3
Reduced M&E Plant Renewals – Networks (20%)		-3.2	-3.6	-2.3	-9.0
Reduced Structures Renewal – Networks (10%)		-1.0	-0.9	-0.9	-2.8

Total - Adjusted proposed capital expenditure	324.9	316.8	301.4	943.2
<b>Efficiency adjustment</b>				
Continuing efficiency	0.50%	0.50%	0.50%	
Catch-up efficiency	0.60%	0.60%	0.60%	
Total cumulative efficiency (compounded)	1.10%	2.19%	3.26%	
Committed capital expenditure	30.3	17.4	0.6	48.3
Adjusted capital expenditure net of committed capital expenditure	294.6	299.5	300.8	894.9
Efficiency adjustment	-3.2	-6.6	-9.8	-19.6
<b>Recommended efficient capital expenditure</b>	<b>321.7</b>	<b>310.3</b>	<b>291.6</b>	<b>923.6</b>
<b>Variance (recommended - proposed)</b>	<b>-20.8</b>	<b>-38.6</b>	<b>-120.7</b>	<b>-180.1</b>
<b>Variance (%)</b>	<b>-6.1%</b>	<b>-11.1%</b>	<b>-29.3%</b>	<b>-16.3%</b>

Review of capital and operating expenditure plans of SA Water - 2013/14 to 2015/16 price determination

APPENDIX

A

CAPITAL EXPENDITURE PROJECT REVIEW SUMMARIES



## PROJECT SUMMARY: CAPABILITY MANAGEMENT

### PROJECT DETAILS

<b>Project Name</b>	<ul style="list-style-type: none"> <li>▶ GWWTP Complete Upgrade of Inlet Screens (not included in sample)</li> <li>▶ Myponga TM Access track upgrade</li> <li>▶ BWWTP DAFF Install pH correct facilities</li> <li>▶ Myponga TWM Pedestrian Access Upgrade</li> <li>▶ Country Groundwater Observation Bores WPFL</li> <li>▶ MAPL Install PS bypass pipework</li> <li>▶ Bolivar WWTP ASR Process Improvement St2</li> <li>▶ Metro Third Party Projects – Wastewater</li> <li>▶ Metro Third Party Projects – Water</li> <li>▶ Whyalla WRP - Solids Carry Over</li> <li>▶ WWTP Capability Management – WPFL</li> <li>▶ Country Convert Observation Bores to Prod WPFL</li> <li>▶ 26No. Others with RBP value &lt;\$1.0m</li> </ul>
<b>Project Number</b>	Various
<b>Program Name</b>	Capability Management (CX0002)

### SCHEME CONCEPT

Part of the Service Reliability Management strategy, the Capability Management Asset Program is to provide infrastructure that is able to:

- ▶ Maintain the capability of providing existing levels of service to customers by reacting efficiently and effectively to changes in regulatory requirements that require equipment upgrades
- ▶ Maintain reliability of infrastructure outputs within a changing operating environment

To reduce high risks identified at treatment plants, major pipelines and networks to enable service standards to be maintained.

In general, this comprises a significant number of relatively small projects. For the purposes of clarity, the GWWTP Complete Upgrade of Inlet Screens project (total value \$19.36m) is omitted from the program expenditure figures below.

	Expenditure (\$m)													
	Actual						Plan							
	06/07	07/08	08/09	09/10	10/11	11/12	12/13	13/14	14/15	15/16	16/17	17/18	18/19	19/20
C0884						0.003		0.050	2.950					

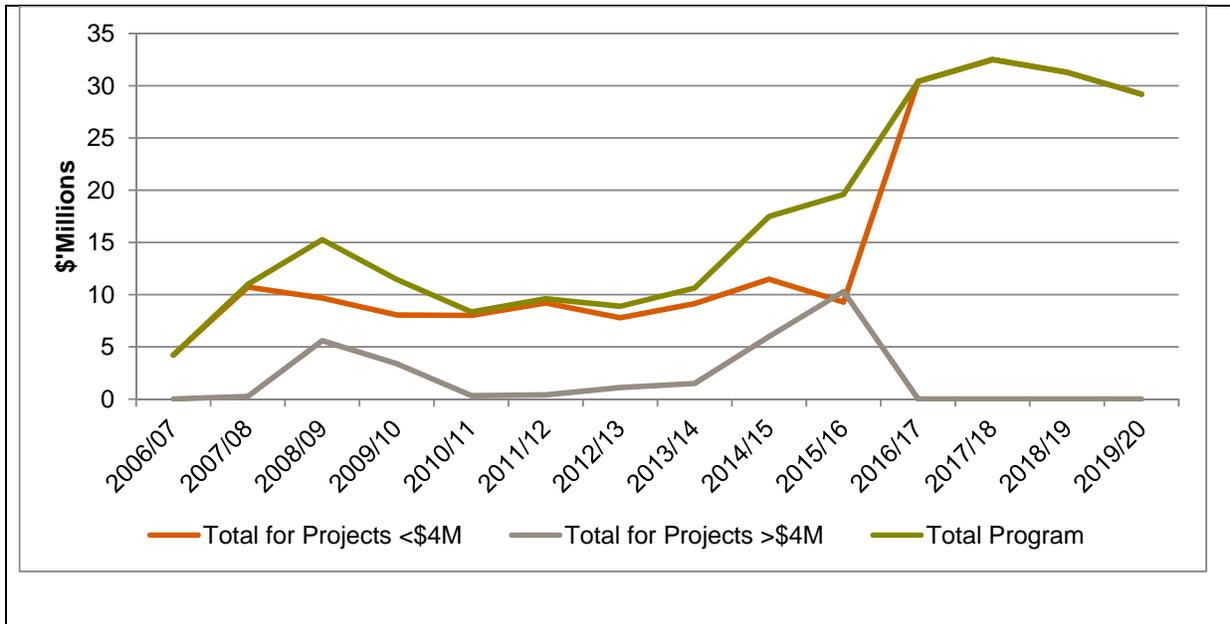
C1667							0.100	0.400	2.200					
N/A							0.070	0.080	0.176	2.334				
CF065								0.800	0.800	0.800				
C2459						0.014		1.000	1.000					
N/A								0.800	0.500	0.500				
C8822						0.410		0.500	0.500	0.500				
C8823						0.510		0.500	0.500	0.500				
C4794						0.140	0.100	1.500						
CF225								0.500	0.500	0.500				
<\$1.0m in RBP						8.122	7.516	3.011	2.357	4.161				
Various excluding GWWTP	4.222	10.925	15.271	11.451	8.348	9.199	7.786	9.141	11.483	9.295	36,410	39,500	31,290	29,190

#### OBSERVATION ON JUSTIFICATION AND SOLUTION DEVELOPMENT

This block of expenditure is dominated by the GWWTP Complete Upgrade of Inlet Screens project (total value \$19.36m) this scheme/project was excluded from this review.

For the period 2006/7 to 2012/13 the average level of expenditure on the Capability Management was \$9.60m/year (when the GWWTP is removed). The proposed level of spend for the coming RBP period is \$9.97m/year. This program of work appears to be a consistent level of spend.

However, we note that the projected figures show expenditure averaging \$34.1m/year for the 2<sup>nd</sup> RBP 4 year period from 2016/7 to 2019/20. It is not clear how much of the future Capability Management expenditure is influenced by larger projects like the GWWTP scheme.



**KEY DOCUMENTS REVIEWED**

- ▶ CX0002\_APS\_Capability\_Management
- ▶ CX99909 Capex Plan 2006-7 to 2019-20
- ▶ Capex Plan ESCOSA
- ▶ Inventory of additional supporting information

## PROJECT SUMMARY: HENDON UPGRADE QUEENSBURY WWPS

### PROJECT DETAILS

<b>Project Name</b>	Hendon Upgrade Queensbury WWPS
<b>Project Number</b>	C5891
<b>Program Name</b>	M&E Plant Renewal - Networks

### SCHEME CONCEPT

This 1935 (1966/7 refurb) sewage pumping station is classed as “the most critical in the state”, serves 40-50K PE and pumps into the Bolivar Trunk Sewer

SA Water have concerns about:

- ▶ The age and condition of the assets
- ▶ Access to the pumps
- ▶ The condition of the wet well
- ▶ The danger of flooding of electrical equipment in the event of failure
- ▶ Odour (40 complaints in 10 years)

	Expenditure (\$m)													
	Actual						Plan							
	06/07	07/08	08/09	09/10	10/11	11/12	12/13	13/14	14/15	15/16	16/17	17/18	18/19	19/20
C5891		0.002		0.294	0.313	0.663	6.759	9.32	0.48	0				

### OBSERVATION ON JUSTIFICATION AND SOLUTION DEVELOPMENT

- ▶ Although we were told that this installation is classed as “the most critical in the state”, there was no document available which classified the criticality of the asset base. The assessment was on the basis of the knowledge of the SA Water staff.
- ▶ No FMECA (failure mode effects and criticality analysis) exists within SAW. We understand any such material would have been held by the United Water contractors, and it was considered that it would not be of any use.
- ▶ The description provided would indicate that there are significant health and safety issues associated with this installation
- ▶ Appropriate options have been considered
- ▶ The document CX0221-A Internal Condition Assessment notes the general condition of the existing pumping station. This was further supported by the CX0221-B Queensbury Wet Well Condition Assessment Report. However, the difficulties associated with carrying out refurbishment makes replacement an appropriate alternative as adjacent land is available.
- ▶ The estimate for the work was in the design report and cost estimate was \$14.2m including 15% contingency (April 2011). ESCOSA reviewed the project in December 2011 and reduced the

approval for the project from \$19.2m to \$17.2m. Before going for FFA in May 2012, detailed design and estimates were prepared.

- ▶ The FFA figure of \$18.04m includes an escalator of \$0.9m. The contract is going to tender around the time of this report. It is understood that it is known that inflation may be negligible or even negative at the current time. The application of escalation is, however, within treasury rules.
- ▶ The contingency represents 15.8% of likely project costs. This figure seems high insofar as detailed design and costing has been carried out and the project is located within a known boundary with limited scope for unforeseen circumstances.
- ▶ We believe that the project is justified, but that contingencies should be halved, reducing the FFA figure by \$0.7m (0.4%) to \$17.34m.

#### **KEY DOCUMENTS REVIEWED**

- ▶ CX0221 Hendon Upgrade Queensbury WWPS C5891
- ▶ CX0221-A Internal Condition Assessment
- ▶ CX0221-B Queensbury Wet Well Condition Assessment Report
- ▶ CX0221-D Concept Design Report
- ▶ CX0221-E Queensbury Cost Estimate, Aquenta
- ▶ CX0221-H Full Financial Approval Submission

## PROJECT SUMMARY: HAPPY VALLEY WTP UPGRADE CHLORINE STATION

### PROJECT DETAILS

<b>Project Name</b>	Happy Valley WTP Upgrade Chlorine Station
<b>Project Number</b>	C0069
<b>Program Name</b>	M&E Plant Renewal – Treatment Plants

### SCHEME CONCEPT

Part of SA Water's core business is to provide a suitable process for:

- ▶ Complying with Australian Standards mainly AS2927: 2001 'The Storage and Handling of Liquefied Chlorine Gas'
- ▶ Producing drinking water in accordance with ADWG.
- ▶ To provide a safe working environment at the treatment plant and ensure compliance with the Occupational Health Safety and Welfare regulations.
- ▶ To contain chemicals within the process without contaminating the surrounding environment.

The project received the approval of the Public Works Committee for the proposal in April 2011

	Expenditure (\$m)													
	Actual						Plan							
	06/07	07/08	08/09	09/10	10/11	11/12	12/13	13/14	14/15	15/16	16/17	17/18	18/19	19/20
C0069		0.009	0.031	0.255	1.343	1.418	4.458	8.882	2.544	0.000				

### OBSERVATION ON JUSTIFICATION AND SOLUTION DEVELOPMENT

- ▶ This project has \$11.426M of expenditure proposed during the RBP period.
- ▶ Appropriate options were considered and the selected replacement option was the only one that didn't carry extreme risks.
- ▶ The job was tendered and awarded (fixed price) for \$11.6m (6 tenders were received from specialist contractors in the range \$11-16m). It is not clear why the figures in the capex tables are not reflective of the tender price (total expenditure in tables of \$17.848M).. This project provides an example of where estimates are likely to be higher than tender return due to the current downturn in the economy.
- ▶ The job appears to be essential and should probably have been done previously due to the health and safety imperatives involved

### KEY DOCUMENTS REVIEWED

- ▶ CX0208 Happy Valley WTP Chlorine Dosing Facility
- ▶ CX0208-A Happy Valley WTP Chlorine Facility Upgrade PWC Report April 2011

- ▶ CX0208-B Happy Valley WTP Chlorine Upgrade Risk Assess Board

## PROJECT SUMMARY: M&E PLANT RENEWAL – TREATMENT PLANTS

### PROJECT DETAILS

<b>Project Name</b>	M&E Plant Renewal – Treatment Plants
<b>Project Number</b>	Various
<b>Program Name</b>	M&E Plant Renewal – Treatment Plants (CX0018)

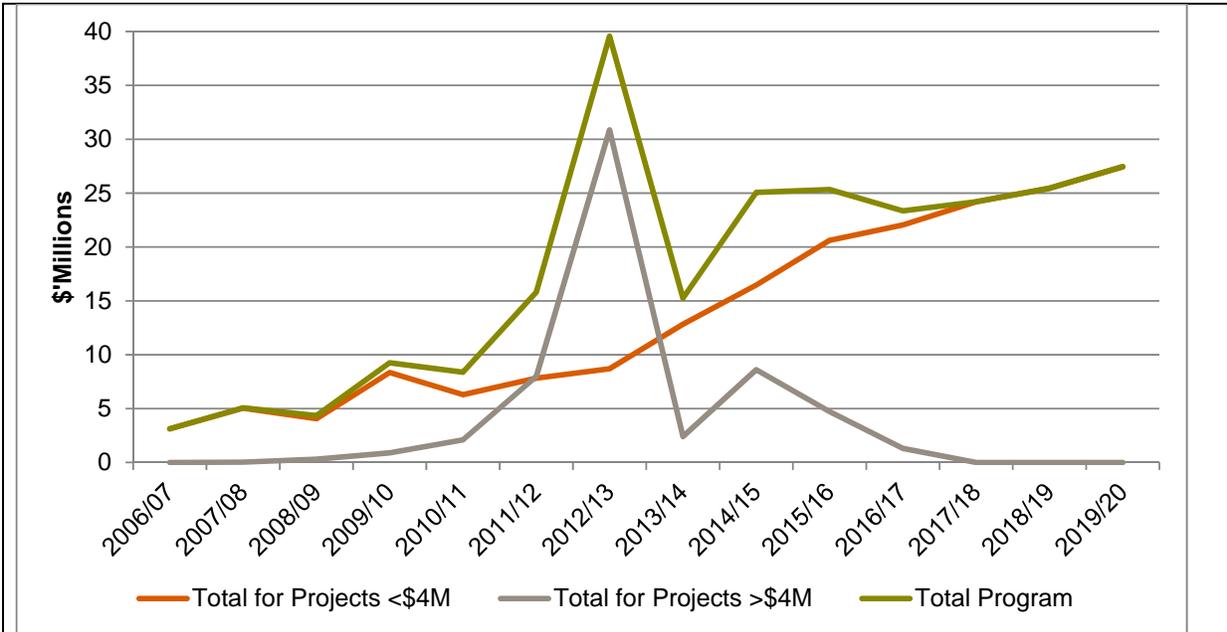
### SCHEME CONCEPT

This program of work is for works to maintain asset reliability of mechanical and electrical infrastructure in Water and Wastewater Treatment Plants at the lowest cost and acceptable level of risk over the lifetime of the asset. It also covers work to achieve efficient and effective performance of the assets and to maintain the levels of service stated in the SA Water Customer Charter, work to address external stakeholder and compliance with all relevant regulatory requirements. The SAW RBP 2013 comprises 50 individual projects with expenditure in the RBP period (29 wastewater for \$34.5m, 21 water for \$18.9m).

	Expenditure (\$m)													
	Actual						Plan							
	06/07	07/08	08/09	09/10	10/11	11/12	12/13	13/14	14/15	15/16	16/17	17/18	18/19	19/20
Various	3.129	5.048	4.056	8.351	6.293	7.866	8.815	13.055	18.068	22.341				

### OBSERVATION ON JUSTIFICATION AND SOLUTION DEVELOPMENT

- ▶ Based upon the Asset Audit Trail documents provided for water treatment, the breakdown of large and small plants and the %age of M&E assets therein, the proposed rate of spend (excluding the proposed work at Happy Valley WTW) would equate to an asset life of approximately 35 years. We believe this is a reasonable (or even low) spend in the longer term.
- ▶ Based upon the Asset Audit Trail documents provided for wastewater treatment, the breakdown of metro and country plants and the %age of M&E assets therein, the proposed rate of spend (excluding the current work at Bolivar WWTP Main PS and proposed work at GWWTP and BWWTP) would equate to an asset life of approximately 28 years. We believe this is a reasonable (or even low) spend in the longer term.
- ▶ The expenditure level (<\$4M projects) on M&E Plant Renewal – Treatment Plants for the 7 years prior to 2013/14 is \$6.2m/year compared with \$17.8m/year during the RPB period.



- ▶ We believe it implausible that the need for M&E Plant Renewal at treatment works should be accelerating at the rate indicated by the spend profile. While we have not considered the detail of every project included in the program, accept that the company is taking a more rigorous approach to capital maintenance planning and there may be an element of backlog expenditure required, a level of spend much beyond the program level would be difficult to justify. With the advent of asset management information gathering enhancements, it is likely that a more robust case could be made beyond the RBP period.
- ▶ While we accept that there has been analysis of criticality and Nessie modeling, there is a lack of evidence that the anticipated catastrophic and extreme events have been occurring in recent years. We would expect with a large asset stock there to be some linkage between outturn and forecast performance.
- ▶ It is probable that current and historic expenditure levels are unsustainable. We propose that a 10% reduction in the program for M&E Plant Renewal – Treatment Plants over the regulatory period.

**KEY DOCUMENTS REVIEWED**

- ▶ CX0018\_ME Treatment Plants
- ▶ CX0018-A Asset Audit Trails Water Treatment Plants
- ▶ CX0018-A Asset Audit Trails Wastewater Treatment Plants

**PROJECT SUMMARY: M&E PLANT RENEWAL – NETWORKS**

**PROJECT DETAILS**

<b>Project Name</b>	M&E Plant Renewal – Networks
<b>Project Number</b>	Various
<b>Program Name</b>	M&E Plant Renewal – Networks (CX0017)

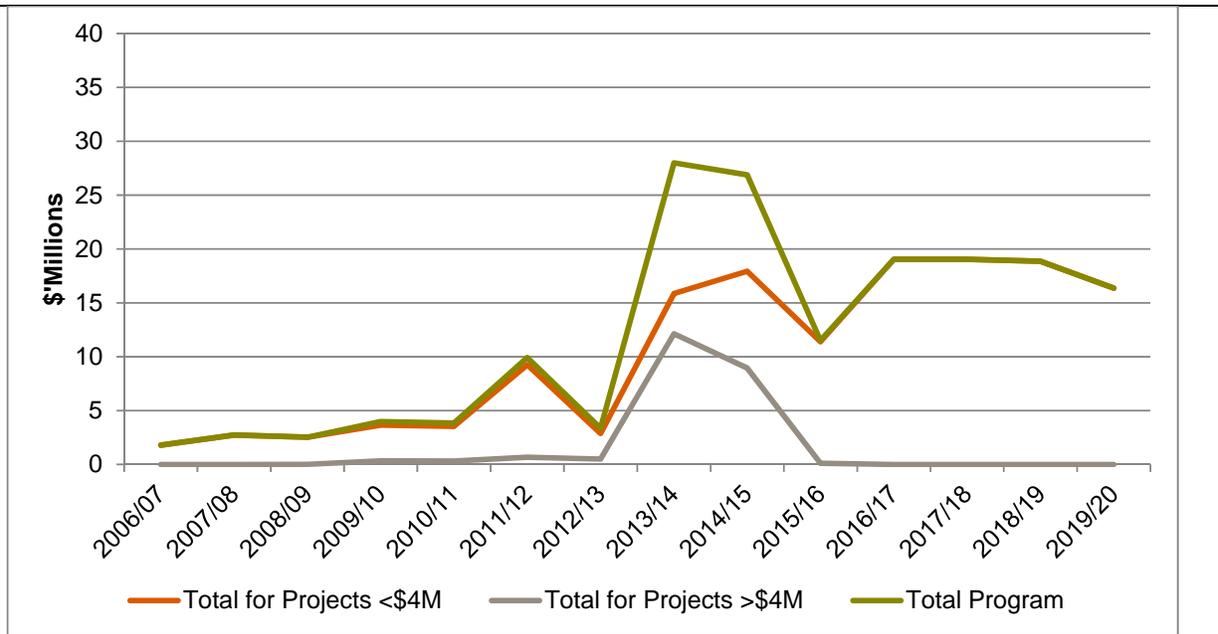
**SCHEME CONCEPT**

This program of work is for works to maintain asset reliability of mechanical and electrical infrastructure in Water and Wastewater Networks at the lowest cost and acceptable level of risk over the lifetime of the asset. It also covers work to achieve efficient and effective performance of the assets and to maintain the levels of service stated in the SA Water Customer Charter, work for compliance with all relevant regulatory requirements. The SAW RBP 2013 comprises 16 individual projects with expenditure in the RBP period (8 wastewater for \$24.8m, 8 water for \$20.4m).

	Expenditure (\$m)													
	Actual						Plan							
	06/07	07/08	08/09	09/10	10/11	11/12	12/13	13/14	14/15	15/16	16/17	17/18	18/19	19/20
Various	1.787	2.728	2.526	3.649	3.530	9.251	2.869	15.868	17.940	11.390				

**OBSERVATION ON JUSTIFICATION AND SOLUTION DEVELOPMENT**

- ▶ We were provided with the below chart profiling expenditure on M&E Plant Renewal – Networks. It can be seen that there is a 4 fold increase in the level of spend on projects <\$4M (average 2006/7 to 2012/3 \$3.8M compared to average 2013/4 to 2015/6 of \$15.1M @ 2011/12 prices)



- ▶ The scale of the proposed program in the context of the asset base as a whole is indicated in the table below. It can be seen that the proposals are (in numerical terms) not excessive. However, the spend is considerably increased from historical levels and the documentation provided does not indicate that the asset base is at or nearing poor condition or performance other than a third of conventional waste water pumping stations. This observation is not reflected in the renewal proposals.

Asset Description		RBP13 Renewal Proposal	
Asset Type	No. Total	No. for Renewal	% of total of Asset Base
<b>Metropolitan WWPS M&amp;E Renewal</b>			
large conventional WWPS	11	1	0.3%
medium conventional WWPS	4	1	0.3%
small conventional WWPS	18	2	0.6%
<b>Conventional WWPS</b>	<b>33</b>	<b>4</b>	<b>0.7%</b>
large submersible	10	1	0.2%
small submersible	318	18	3.0%
<b>Submersible WWPS</b>	<b>328</b>	<b>19</b>	<b>3.2%</b>
Switchboards	328	15	2.8%
<b>Country WWPS M&amp;E Renewal</b>			
large conventional WWPS	2	0	0.0%
medium conventional WWPS	4	1	0.4%
small conventional WWPS	15	3	1.3%
<b>Conventional WWPS</b>	<b>21</b>	<b>4</b>	<b>0.7%</b>
large submersible	2	1	0.2%
small submersible	208	13	2.2%
<b>Submersible WWPS</b>	<b>210</b>	<b>14</b>	<b>2.4%</b>
Switchboards	210	6	1.1%
<b>Metropolitan WPS M&amp;E Renewal</b>			

Large WPS	10	1	3.0%
Medium WPS	10	1	3.0%
Small WPS	13	2	6.1%
Conventional WPS	33	4	1.9%
Country WPS M&E Renewal			
Large WPS	16	1	0.6%
Medium WPS	34	3	1.7%
Small WPS	126	9	5.1%
Conventional WPS	176	13	6.2%

- ▶ While we accept that there has been analysis of criticality and Nessie modeling, there is a lack of evidence that the anticipated catastrophic and extreme events have been occurring in recent years. We would expect with a large asset stock there to be some linkage between outturn and forecast performance.
- ▶ It is probable that current and historic expenditure levels are unsustainable. However, we do not see a case for a 4x increase in spend and propose that a 20% reduction in the program for M&E Plant Renewal – Networks over the regulatory period.

#### KEY DOCUMENTS REVIEWED

- ▶ CX0017\_APS\_ME\_Networks
- ▶ CX0017-A Code of practice for wastewater overflow management
- ▶ CX0017-E Safe Water Drinking Act 2011
- ▶ CX0017-G Asset Audit Trail (AAT) for Sewage Pumping Stations – June 2011
- ▶ CX0017-H Asset Audit Trail (AAT) for Water Pumping Stations – June 2011
- ▶ CX0017-I Asset Audit Trail (AAT) for Water Dosing Stations – June 2011
- ▶ CX0017-J Strategic asset Management Model (Nessie) report
- ▶ CX0017-K Criticality Process development Documentation and User Guide

## PROJECT SUMMARY: WATER NETWORK RETICULATION MAINS RENEWAL

### PROJECT DETAILS

<b>Project Name</b>	Water Network Reticulation Mains Renewal
<b>Project Number</b>	Various
<b>Program Name</b>	CX0040

### SCHEME CONCEPT

- ▶ The objective of the Water Reticulation Network Management Program is to manage Reticulation Mains across the state to consistently meet the required standard of service and asset reliability at the lowest cost and acceptable level of risk. This objective is in direct alignment with, and helps deliver, the SA Water Corporate Strategic Plan and Draft Asset Management Policy.
- ▶ SA Water has almost 23,000 km of water mains (including fire services) across the metropolitan and country regions.
- ▶ This program covers Reticulation mains (diameter <375). Reticulation mains comprise 86% by length of all water mains in the state. With a 2011/12 replacement value of \$6,800m, this makes water reticulation mains the single biggest class of assets both in terms of size and replacement value. In terms of length of mains installed, approximately 64% of reticulation mains were constructed more than 50 years ago, 32% are more than 80 years old and 14% are more than 100 years old, hence approaching the end of their estimated asset life.
- ▶ Over 47% of reticulation mains are made of asbestos cement (AC), with 28% made of cast iron (CI, CICL or CICS) and 9% made of poly vinyl chloride (PVC). Other Material types include, ductile iron concrete lined (DICL), mild steel concrete lined (MSCL), poly ethylene (PE) and several other less common materials make up the remainder of the reticulation network.

	Expenditure (\$m)													
	Actual						Plan							
	06/07	07/08	08/09	09/10	10/11	11/12	12/13	13/14	14/15	15/16	16/17	17/18	18/19	19/20
CX0040	3.624	8.970	9.782	11.552	12.509	17.667	7.597	23.389	22.309	21.695				

### OBSERVATION ON JUSTIFICATION AND SOLUTION DEVELOPMENT

- ▶ The data provided below by the company shows no indications of a rapidly increasing burst rate. On the contrary, the company appears to have good control and is targeting its reticulation mains renewals effectively.

#### Country

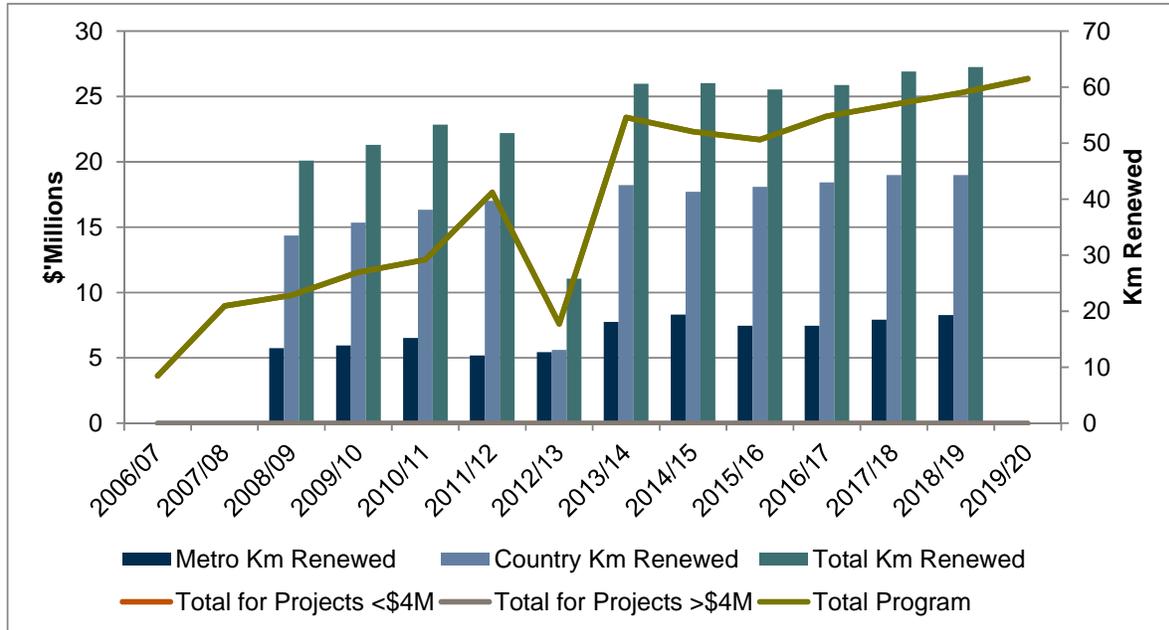
Indicator	06/07	07/08	08/09	09/10	10/11
Burst rate (#/100km)	12.0	12.7	12.0	12.4	11.3

#### Adelaide

Indicator	06/07	07/08	08/09	09/10	10/11

Burst rate (#/100km)	27.4	26.4	27.9	23.5	21.3
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- ▶ As can be seen from the chart below, with the exception for the year 2012/3 when we understand there are external constraints on expenditure, the outturn expenditure has been rising steadily to the level proposed for the RCP13 period.



- ▶ We saw in practice the means by which SA Water selects reticulation mains for renewal. The approach aligned with good practice we have seen elsewhere.
- ▶ The proposals imply an asset life of 380 years.
- ▶ While this work shows an increasing trend, our observation is that the work is well targeted and should remain at the proposed expenditure level.

**KEY DOCUMENTS REVIEWED**

- ▶ CX0040\_APS\_Water\_Network\_Management\_Reticulation\_Mains
- ▶ CX0040-B CSIRO – Analysis of Water Mains Failures in Adelaide
- ▶ CX0040-C CSIRO – Analysis of Country Mains Data
- ▶ CX0040-D Water mains Prioritization Tool – Explanatory Report
- ▶ CX0040-G Example Water Reticulation Condition Assessment Report – CR99
- ▶ CX0040-H Example Flow Test Report Marlestone

## PROJECT SUMMARY: BOLIVAR PRE-AERATION CONCRETE REHAB

### PROJECT DETAILS

<b>Project Name</b>	Bolivar Pre-Aeration Concrete Rehab
<b>Project Number</b>	C1467
<b>Program Name</b>	Structures Renewal – Treatment Plants

### SCHEME CONCEPT

- ▶ Pre-aeration tanks were constructed at Bolivar WWTP (the main Adelaide treatment plant) in 1963 and are below ground reinforced concrete. In 2001 fibreglass covers were fitted as part of the Bolivar odour control project. In 2005 SAW Material Sciences Group reported severe corrosion of the concrete in BWWTP pre-aeration tanks. Areas of concrete above the normal waterline have been affected by sewer gas (hydrogen sulphide) which has attacked the concrete.
- ▶ The existing process, Pre-aeration grit removal, is not considered to be in line with current industry standards. This work is a key part of a strategy to delay a capacity upgraded of the treatment plant until 2040.
- ▶ The work comprises the repair of the concrete with improvements to the process where appropriate.

	Expenditure (\$m)													
	Actual						Plan							
	06/07	07/08	08/09	09/10	10/11	11/12	12/13	13/14	14/15	15/16	16/17	17/18	18/19	19/20
C1467			0.023	0.070	0.125	0.602	1.068	1.358	12.651	20.964	9.221			

### OBSERVATION ON JUSTIFICATION AND SOLUTION DEVELOPMENT

- ▶ There has been early contractor involvement due to the specialist nature of the work and we have seen the detailed concrete investigation report.
- ▶ There was considerable documentation showing the extent to which the long term future of the works, the processes used and the condition has been considered and optioneering carried out. With the contractor involvement and the relative maturity of the project, we see no specific reason to reduce the capital expenditure below the proposed level of \$35.0M over the review period.

### KEY DOCUMENTS REVIEWED

- ▶ CX0204 Bolivar Pre-Aeration Replacement C1467
- ▶ CX0204-A Draft Full Financial Approval Submission June 2011
- ▶ CX0204-B Risk Assessment Bolivar WWTP Primary Treatment Concrete Rehab - 091111
- ▶ CX0204-C Bolivar Pre-aeration Concept Plan Estimate June 2011
- ▶ CX0204-D Bolivar Future Strategy SAW 2010
- ▶ CX0204-E BWWTP Pre-aeration Concrete Report KBR 2008

- ▶ CX0204-F Bolivar WWTP Grit Removal Study Report Aurecon 2012
- ▶ CX0204-G Bolivar Current Situation SAW 2009
- ▶ Concrete Investigation Report July 2012
- ▶ CX0056 – High level update of capital expenditure projects

## PROJECT SUMMARY: STRUCTURES RENEWAL - NETWORKS

### PROJECT DETAILS

<b>Project Name</b>	Structures Renewal - Networks
<b>Project Number</b>	Various
<b>Program Name</b>	CX0029

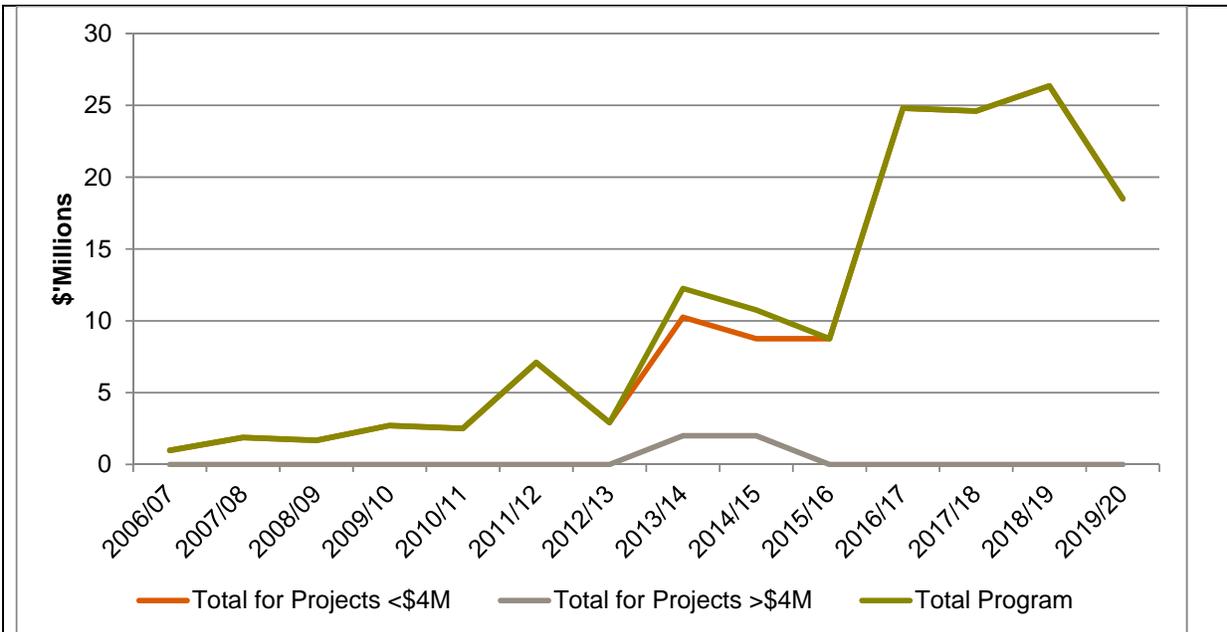
### SCHEME CONCEPT

<ul style="list-style-type: none"> <li>▶ The Structures Management – Networks program is to manage structures within water and wastewater networks to meet required standards of service, asset reliability, and structural integrity at the lowest cost and acceptable level of risk over the lifetime. To effectively manage structures so that they provide water and wastewater services that are fit for purpose, cost effective and comply with regulatory requirements.</li> <li>▶ The program includes all structures in the water and wastewater networks including pumping stations (including below ground stations), storage tanks, chemical dosing stations and valve chambers. It excludes structures associated with the major pipelines which are included in the Structures Management Major Pipelines Program. It also excludes wastewater network access holes, educt and induct vent structures which are included within the asset program for Wastewater Network Management – Ancillaries.</li> <li>▶ The water network asset base comprises: 469 Water Pumping Stations (94 metro); 769 Water Storage Tanks; 34 Earth Bank Storages, (consolidated listing state-wide); 142 Water Dosing Stations (4 metro); 131 Bores – not including the 46 on Eyre; and other associated asset classes including Valve Chambers, Buildings, Tunnels/Culverts, Energy Dissipaters, Above Ground Pipeline Trestles &amp; Anchor Blocks, Roadways, Footpaths, and Drainage.</li> <li>▶ The wastewater network asset base comprises: 51 Wastewater Pumping Stations (331 metro); and other associated asset classes including Chamber Structures, Ventilation Systems, Buildings, and Roadways, Footpaths and Drainage.</li> </ul>
--

	Expenditure (\$m)													
	Actual						Plan							
	06/07	07/08	08/09	09/10	10/11	11/12	12/13	13/14	14/15	15/16	16/17	17/18	18/19	19/20
Various	0.975	1.879	1.680	2.707	2.505	7.090	2.917	10.250	8.750	8.750				

### OBSERVATION ON JUSTIFICATION AND SOLUTION DEVELOPMENT

<ul style="list-style-type: none"> <li>▶ We were provided with the below chart profiling expenditure on Structures Renewal – Networks. It can be seen that there is a 3 fold increase in the level of spend on projects &lt;\$4M (average 2006/7 to 2012/3 \$2.8M compared to average 2013/4 to 2015/6 of \$9.3M @ 2011/12 prices)</li> </ul>
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- ▶ While we accept that there has been considerable analysis of the asset base, there is a lack of evidence that the anticipated catastrophic and extreme events have been occurring in recent years. We would expect with a large asset stock there to be some linkage between outturn and forecast performance. However, we understand that work is already scheduled to commence prior to the regulatory period, indicating a genuine urgency.
- ▶ It is probable that current and historic expenditure levels are unsustainable and the company shows a long term significant increase in expenditure. However, we do not see a robust case for a 3x increase in spend for RCP13 and propose that a 10% reduction in the program for Structures Renewal – Networks over the regulatory period.

**KEY DOCUMENTS REVIEWED**

- ▶ CX0029\_APS\_Structures\_Networks
- ▶ CX0029-A Bore Condition Report
- ▶ CX0029-M Asset Audit Trail Sewer Connections
- ▶ CX0029-N Asset Audit Trail Sewer Mains
- ▶ CX0029-O Asset Audit Trail Water Connections
- ▶ CX0029-P Asset Audit Trail Water Meters

## PROJECT SUMMARY: KANGAROO CREEK DAM SAFETY INVESTIGATION

### PROJECT DETAILS

<b>Project Name</b>	Kangaroo Creek Dam Safety Investigation
<b>Project Number</b>	C7431
<b>Program Name</b>	Safety

### SCHEME CONCEPT

This project is to upgrade flood capacity of Kangaroo Creek Dam. The dam spillway must have the capacity to pass the Probable Maximum Flood (PMF) without failing, whereas the spillway only has the capacity to pass floods with annual return periods of between 1 in 60,000 and 1 in 115,000 years. The required spillway capacity is 6,000 m<sup>3</sup>/s. The current capacity is only 1,500 m<sup>3</sup>/s.

	Expenditure (\$m)													
	Actual						Plan							
	06/07	07/08	08/09	09/10	10/11	11/12	12/13	13/14	14/15	15/16	16/17	17/18	18/19	19/20
CX007	0.030	0.248	0.080	0.002	0.000	0.000	0.500	4.000	35.000	35.500	4.500	0.000	0.000	0.000

### OBSERVATION ON JUSTIFICATION AND SOLUTION DEVELOPMENT

There is no specific dam safety regulation in South Australia. SA Water is self-regulated for dam safety. The SA Water Board has endorsed use of the Australian National Committee on Large Dams (ANCOLD) guidelines for the assessment of dam safety. Use of the dam safety guidelines is consistent with practice elsewhere in Australia.

SA Water has undertaken a long term program to identify and address the safety risk posed by its dams. This commenced in 1998 when a Portfolio Risk Assessment (PRA) of Large Dams was completed using the ANCOLD standards as the reference point. This study recommended a staged Dam Safety Improvement Program (DSIP) with four phases. The improvement program addresses risks to life first and economic loss second. Phase 1 and 2 works are complete except for an upgrade to the Tod Reservoir.

A hydrology study and assessment of dam failure consequences for Kangaroo Creek Dam were completed in 2005. A safety review was then undertaken in 2006.

The population at risk from failure of Kangaroo Creek Dam is around 100,000. Estimates of the potential loss of life from failure of Kangaroo Creek Dam range from 157 to 1,476 depending on the type of failure (sunny day at the low end, PMF at the high end). Based on these estimates, the cost per life is between \$50k and \$500k. According to the guidelines, there is Very Strong justification for undertaking works if the cost of the works is less than \$1.5M per life saved. By comparison the Queensland dam safety management regulations specify that works are justified if the cost per life saved is less than \$5M. The works would be justified in Queensland even if they were almost ten times more expensive, everything else being equal.

We believe that there is strong justification for these works and they are therefore prudent.

The preferred option for meeting the spillway capacity is to widen the spillway chute and raise the embankment. This option was selected as the conclusion from a 2009 study which considered four options and assessed them on financial and non-financial criteria. The initial cost estimate in this study was \$66M. SA Water now proposes \$79.9M to complete the works due to escalation and the requirement to undertake ancillary works.

**KEY DOCUMENTS REVIEWED**

- ▶ CX007-C RAC Engineers & SKM- Portfolio Risk Assessment of SA Water's Large Dams 1998
- ▶ CX007-D Kangaroo Creek Dam Flood Hydrology Study SKM 22 July 2005
- ▶ CX007-E Kangaroo Creek Dam Stage 2 Safety Review Investigations and Concept Design of Remedial Works SMEC May 2009
- ▶ CX007-F Millbrook and Kangaroo Creek Preliminary Assessment of Dam Break Consequences SKM Sep 2005
- ▶ CX007-G Kangaroo Creek Dam Stage 1 Safety Review Final Report PB SMEC Oct 2006
- ▶ RFI0027.04 Kangaroo Creek Dam Upgrade

## PROJECT SUMMARY: OCCUPATIONAL HEALTH & SAFETY IMPROVEMENT

### PROJECT DETAILS

<b>Project Name</b>	Occupational health and safety improvement
<b>Project Number</b>	Various
<b>Program Name</b>	Safety

### SCHEME CONCEPT

The occupational health and safety improvement program totals \$38M over three years. The three largest sub-programs of work comprise around half of all expenditure and are:

- ▶ Relocate WWPS off-road (\$11.80M)
- ▶ Improve tank access (\$4.80M)
- ▶ Improve below ground valve access (\$3.15M)

The other half of the total program expenditure is for other sub-programs of work to address issues such as asbestos, fire detection, fall prevention and valve access.

	Expenditure (\$m)													
	Actual						Plan							
	06/07	07/08	08/09	09/10	10/11	11/12	12/13	13/14	14/15	15/16	16/17	17/18	18/19	19/20
Various	1.222	1.626	3.230	8.448	9.473	17.017	11.209	15.287	11.480	11.200				

### OBSERVATION ON JUSTIFICATION AND SOLUTION DEVELOPMENT

We reviewed the following elements of work which together comprise around 70% of all expenditure under this program:

Project No	Project Name	RBP spend
CF070	Relocate WWPS Off Road – WPFL	\$ 11,800.0
CF068	Improve Tank Access – WPFL	\$ 4,800.0
	Impr Below Ground Valve Access	\$ 3,150.0
C0403	Metro WWPSs Fall Prevention	\$ 2,744.0
CF074	Fire Detect & Emerg Evacuation – WPFL	\$ 2,250.0
CF082	Hazardous Areas Upgrade – WPFL	\$ 2,000.0

We found that all of these expenditure items were ongoing programs to address health and safety risks that had been identified by SA Water some years ago. Typically, the risks had been identified through high level risk assessment or investigation.

We reviewed the risk assessment and prioritisation for the WWPS relocation, tank access and below ground valves programs and found them to be sound. The risk assessment has considered risk factors specific to

the situation, e.g. pipe diameter for below ground valve access and tank height for tank access.

We believe that the prioritisation of these sub-programs of works by SA Water has led to lower costs than if it undertook all of the works in a shorter period of time. Given the risks identified, we believe that SA Water would have been justified to complete the works sooner than planned. This demonstrates that SA Water as an organisation is willing to balance risk and cost in delivering its services.

The costs for these programs are based on historical costs as the programs have been underway for a number of years. We noted that the costs may understate the full cost of the works as on-costs had not been determined consistently.

#### **KEY DOCUMENTS REVIEWED**

- ▶ CX0019-D Eyre Region Valve Access Prioritisation Assessment Report
- ▶ CX0019-E Eyre Region PRV Prioritisation Model
- ▶ CX0019-F Northern Region Valve Access Prioritisation Assessment Report
- ▶ CX0019-G Northern Region PRV Prioritisation Model
- ▶ CX0019-H Above Ground Tank Prioritisation Summary
- ▶ Email: FW: Response to RFI0027.15 Improve Tank Access – WPFL
- ▶ WWPS prioritisation.xlsx

## PROJECT SUMMARY: WATER QUALITY – NETWORKS

### PROJECT DETAILS

<b>Project Name</b>	Various
<b>Project Number</b>	Various
<b>Program Name</b>	Water quality – Networks

### SCHEME CONCEPT

This expenditure item is a program of works aimed at improving water quality in SA Water’s distribution network. Of the \$18.6M in total expenditure planned, \$16.5M is for undefined ‘funding lines’ - \$10.5M for county areas, \$6M for metropolitan areas. The largest defined item is \$1.65M to improve water quality at Naracoorte.

	Expenditure (\$m)													
	Actual						Plan							
	06/07	07/08	08/09	09/10	10/11	11/12	12/13	13/14	14/15	15/16	16/17	17/18	18/19	19/20
Various	0.874	0.634	1.140	2.257	5.403	5.572	3.511	7.360	5.704	5.550				

### OBSERVATION ON JUSTIFICATION AND SOLUTION DEVELOPMENT

SA Water informed us that the scope for this program of works had been established through a risk assessment across its 79 water supply systems. SA Water is required under the *Water Act* to take a risk based, multi-barrier approach to managing water quality. The risk assessment considered 10 water quality hazards relating to disinfection efficacy and disinfection by-products. The hazard area considered were:

- ▶ Enteric Protozoa
- ▶ Bacteriological & Viral - Treatment
- ▶ Bacteriological & Viral - Residual Maintenance
- ▶ Amoeba
- ▶ Health Related Inorganic Chemicals
- ▶ Disinfection By Products
- ▶ Health Related Organic Chemicals
- ▶ Radiological Agents
- ▶ Cyanobacterial Toxins
- ▶ Aesthetics

SA Water has had an ongoing program for a number of years to address these risks dealing with the highest risks first. The funding lines are a continuation of this program. The works to be completed for example include installing disinfection at booster stations and modifying storage pipework to prevent short-circuiting.

For the Naracoorte project, risk assessment identified high risks to customers from bacteriological, amoebic and disinfection by-product hazards. This is primarily due to un-disinfected water being supplied to customers. Options analysis by Tonkin consulting concluded that a transfer pipeline from the bores to the tank is the preferred option as this will enable disinfection at a single point prior to supply to customers.

We found that there is a clear need for these works based on SA Water's risk assessment in line with its obligations under legislation.

The costing for these works is based on historical costs of the program. We believe that the costs proposed are reasonable as they are based on recent experience with these activities.

#### **KEY DOCUMENTS REVIEWED**

- ▶ CX0042-C Water Quality Risk Management Framework August 2012
- ▶ Systemriskassessmentsummary.xlsx (RFI0027.1)
- ▶ Naracoorte WQ risk assessment.xlsx
- ▶ RFI0027.13 Naracoorte WS Improve Disinfection.msg
- ▶ Naracoorte disinfection options report.pdf

## PROJECT SUMMARY: BUSINESS APPLICATION RISK

### PROJECT DETAILS

<b>Project Name</b>	Various
<b>Project Number</b>	Various
<b>Program Name</b>	Business application risk

### SCHEME CONCEPT

Expenditure of \$16M is proposed by SA Water for this program which is primarily aimed at renewing and upgrading SA Water's core information systems to manage its business risk. There are 43 separate expenditure items with average expenditure of \$373k proposed under this program in the review period demonstrating that this is a very broad program composed of many small elements. There are 11 expenditure items with total expenditure in the review period greater than \$500k. These are detailed following.

Project Name	RBP spend
Financial Reporting	\$ 1,500.0
Migrate Corporate Internet Site	\$ 1,400.0
Migrate off Maximo 5 to Maximo7	\$ 800.0
Consolidation of Incident Management Sys	\$ 800.0
Reporting Engine Standardisation Program	\$ 800.0
Chris21 Maintenance	\$ 600.0
Maximo 7 Enhancements	\$ 600.0
CSIS Enhancement Program	\$ 500.0
CAMS Enhancement Work	\$ 500.0
Mobility for Asset and Works Mgt Refresh	\$ 500.0
Migrate EMPRIA to Consolidated Platform	\$ 500.0

	Expenditure (\$m)													
	Actual						Plan							
	06/07	07/08	08/09	09/10	10/11	11/12	12/13	13/14	14/15	15/16	16/17	17/18	18/19	19/20
Various	0.013	0.067	0.131	0.078	0.135	2.808	6.161	4.680	7.330	4.030				

### OBSERVATION ON JUSTIFICATION AND SOLUTION DEVELOPMENT

We discussed the two largest expenditure items with SA Water – Financial reporting improvements (\$1.5M) and Migration of the corporate internet site (\$1.4M). We found that these two projects lacked the rigorous justification we had seen for other items of capital expenditure and found that the supporting information tended to focus on the 'solution' rather than the 'need'.

In response to our request for further justification of the Financial reporting improvements project, SA Water

provided more supporting information and noted that:

*“There are several reporting applications including MS Reporting Services, Mercury, Business Objects, Amulet, MS Excel & MS Access, as well as specialist GIS mapping services (currently in use). As a result reporting solutions are using a variety of data sources and reports that are not validated, rules are not well documented and in some extreme cases can result in differing analysis results.”*

The benefits of the project were noted as:

- *Better ability to meet financial reporting requirements through automated data download and consolidation from the variety of sources;*
- *Automated production of reports;*
- *Increased capability for users to define and run their own reports;*
- *Improved dashboard and graphical reporting;*
- *Better outcomes from business decisions through improved access to historic data;*
- *Immediacy of data information; and*
- *Improved auditability.*

The above information was not received with the initial information request and supporting information to SA Water’s submission which leads us to conclude that the original justification for this project was not undertaken with the same level of rigour as we have seen for other capital expenditure projects.

We were surprised to find that SA Water believes that this project to streamline its business processes will lead to additional costs of \$10k per annum. SA Water has identified these costs as being for:

*“Approximately 5 days per annum of support by a technical (reporting specialist) consultant to maintain and make minor modifications to the financial reports.”*

While we do not question that 5 days for a technical consultant per year may be required to maintain and modify the reports, we note that there has been no weighing of the benefits against this cost. The benefits are as described in the list above by SA Water. As we note in Section 7, information services are a key enabler of business efficiencies and we believe that a project such as this should deliver significant benefit to SA Water that will lead to real costs savings.

After considering the available information, we believe that, although not clearly articulated, there is a need for the proposed expenditure in this area. We are however, surprised that SA Water does not consider that this expenditure will lead to operating cost efficiencies. We have accordingly made allowance for this expenditure to generate cost savings in the determination of the efficiency factor we propose be applied to operating expenditure (see Section 7.3).

#### KEY DOCUMENTS REVIEWED

- ▶ F.4 SA Water - IS Capital Planning Approach and Summary FY12-15
- ▶ F.5 KPMG - Review of Information Systems Expenditure Proposal for Regulatory Purposes
- ▶ CX0400 - SA Water – Technology Strategy
- ▶ CX0401 - IS Capital Plan Executive Summary and Roadmap
- ▶ Description on Financial Reporting IS Initiative



**PROJECT SUMMARY: MT BARKER WATER SUPPLY INVESTIGATION**

**PROJECT DETAILS**

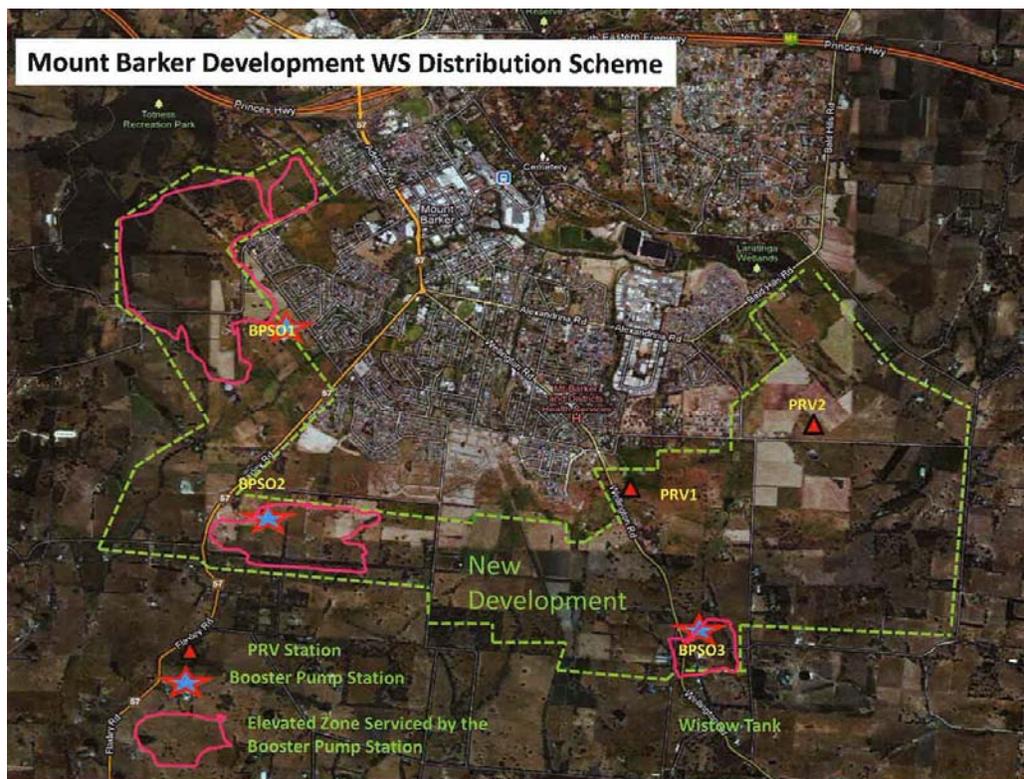
<b>Project Name</b>	Mt Barker Water Supply Investigation
<b>Project Number</b>	C8917
<b>Program Name</b>	Growth - Networks

**SCHEME CONCEPT**

This project is to provide water supply infrastructure to new development areas in Mt Barker. Mt Barker is in the Adelaide Hills and is in commuting distance to Adelaide so has been identified by the State Government as a location for accommodating future growth in its '30 Year Plan for Greater Adelaide'. Wastewater services in Mt Barker are currently supplied by the local government. There is possibility that SA Water may take on this responsibility as the development proceeds. No expenditure has been included by SA Water in its proposal for this possibility.

Approximately 1,265 hectares of land has been rezoned from Rural to Residential and is expected to provide around 10,000 new lots. Mt Barker is currently supplied from the Summit Storage WTP north of Littlehampton. This plant has capacity to supply to the new growth areas. However, distribution infrastructure is required to deliver the water to the rezoned land.

SA Water provided to us the following figure which shows the location of the new development in relation to the existing developed areas. This figure shows that the new development is large compared to the size of the existing town. SA Water informed us that there is no formal coordination of land releases in this development (or in South Australia in general) meaning that it has to plan to provide infrastructure across the whole development area simultaneously.

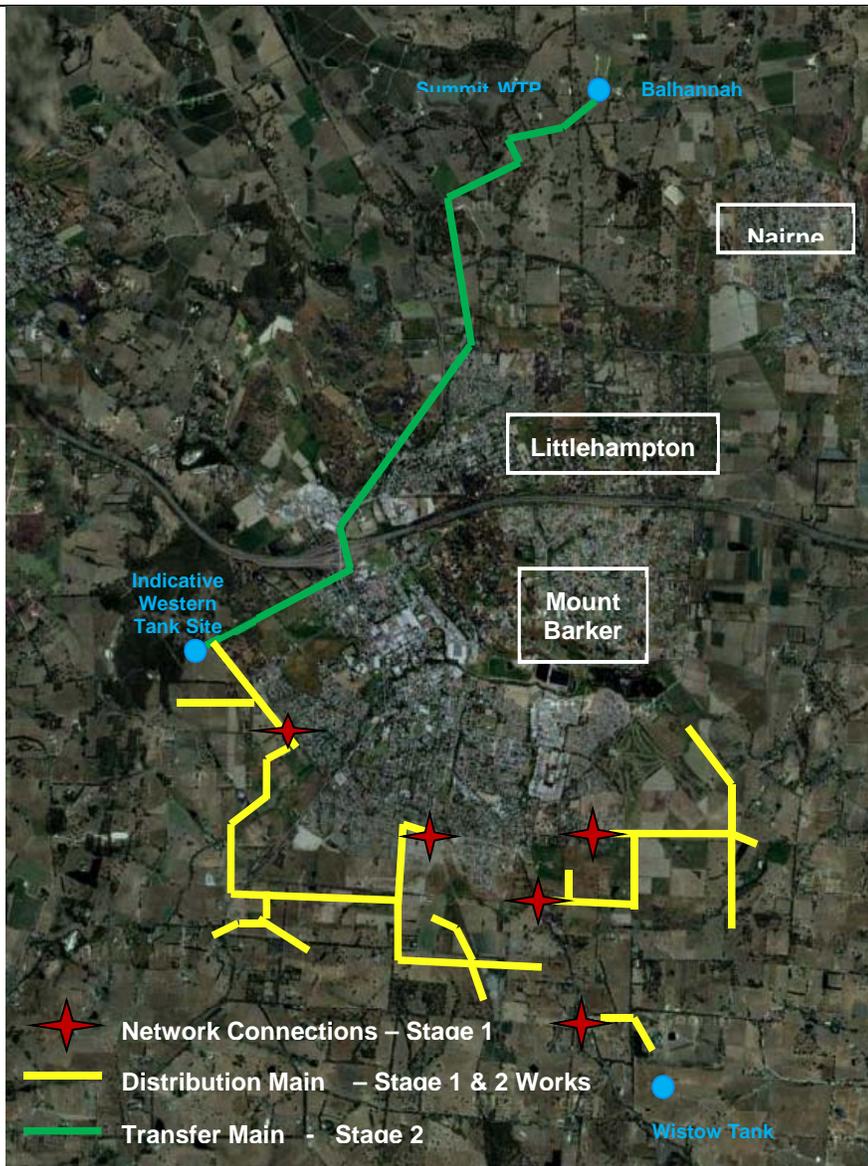


	Expenditure (\$m)													
	Actual						Plan							
	06/07	07/08	08/09	09/10	10/11	11/12	12/13	13/14	14/15	15/16	16/17	17/18	18/19	19/20
C8917							3.954	16.164	2.798	0.000				

**OBSERVATION ON JUSTIFICATION AND SOLUTION DEVELOPMENT**

Planning work was commissioned by SA Water in 2011 (Mt Barker Water Supply MCA Report, Mt Barker Water Supply Concept Design Report, both undertaken by SKM). However, since completion of this work, SA Water has engaged in an early contractor involvement process so that it can capitalise on innovative ideas that may exist in the market. This process has identified alternative infrastructure routing options not previously considered by SA Water that are lower cost than initial estimates.

The proposed solution is to deliver the required distribution infrastructure in two stages as shown below.



SA Water has prepared a Board submission and expects to receive financial approval in December 2012. There is considerably uncertainty over the rate of take up of development and its location. SA Water has submitted a revised estimate of costs during the regulatory period of \$19.0M down from \$32.2M in the original submission. This reflects a lower than anticipated rate of development in the area and hence conservative assumptions by SA Water over the infrastructure to be provided. We support this approach.

The fact that there is limited coordination over land releases for development in South Australia means that SA Water may have to provide services to multiple developers across multiple growth fronts in Mt Barker. This is very likely to lead to sub-optimal provision of infrastructure in this development compared to if land releases were more coordinated.

We are satisfied that there is a need to provide infrastructure by SA Water and that it is planning the nature of the infrastructure provided to the extent possible.

**KEY DOCUMENTS REVIEWED**

- |            |   |
|------------|---|
| ▶ C8917    | Mt Barker Project Information.docx                          |
| ▶ C8917    | Mt Barker Scheme Layout.pdf                                 |
| ▶ CX0213-A | Mt Barker Water Supply MCA Report, SKM May 2011             |
| ▶ CX0213-D | Mt Barker Water Supply Concept Design Report, SKM Sept 2011 |

## PROJECT SUMMARY: MURRAY BRIDGE WWTP UPGRADE

### PROJECT DETAILS

<b>Project Name</b>	Murray Bridge WWTP Upgrade
<b>Project Number</b>	C0387
<b>Program Name</b>	Growth – Treatment Plants

### SCHEME CONCEPT

SA Water has proposed to invest \$188M (\$107M in the review period) to upgrade the Murray Bridge wastewater treatment plant. Construction is proposed to commence in 2014/15 and be completed by 2017/18. A number of planning studies have been completed including a site selection study.

	Expenditure (\$m)													
	Actual						Plan							
	06/07	07/08	08/09	09/10	10/11	11/12	12/13	13/14	14/15	15/16	16/17	17/18	18/19	19/20
CO387	0	0	0	0.234	0.558	0.407	2.173	8.000	19.208	80.000	47.000	31.000	0	0

### OBSERVATION ON JUSTIFICATION AND SOLUTION DEVELOPMENT

SA Water notes the following drivers for this work:

- ▶ Growth – the current plant is estimated to be subject to loading of 20,000 EP compared to a design capacity of 12,000EP
- ▶ Odour complaints from neighbouring properties
- ▶ Flood risk – the plant is below the 1956 flood level which is seen as a benchmark for planning.

The impacts of growth are typically seen in deteriorating effluent quality. However, all the effluent from this plant is reused at either a piggery or in a wetland owned by the Department of Defence. We queried whether the end users had expressed concern that the effluent provided was not fit for purpose. SA Water responded that other than for short term quality issues, the end users were satisfied with the effluent quality.

Further, SA Water provided to us influent and monitoring data for the treatment plant for the time since 2007/08. This shows that while the volume of influent on a median monthly flow basis has increased by 12% over this 6 years period (from 72.9ML to 82ML), the influent BOD load in kg/d has shown significant decrease suggesting that the organic loading on the plant is less than before.

As this is a lagoon treatment plant, overloading would result in an increased need for desludging the lagoons and increased risk of the lagoons becoming anaerobic. We were informed that the lagoons are on a 3 year desludging cycle and that the next desludging will be undertaken at 3 years as planned. This does not indicate significantly deteriorating plant performance and agrees with the analysis above on influent BOD load.

We also note that there has been no deterioration in effluent quality as measured at the Army lagoons for the parameters of BOD, SS and TN. In fact, many of these have improved over the monitoring period.

On the basis of the above, we do not believe that there is a need to upgrade this plant currently based on plant performance due to loading.

SA Water informed us that it had received only 16 odour complaints relating to this site in 7 years (6 recorded by the EPA and 10 recorded by SA Water). We believe that this is a very low rate of complaints and insufficient to drive upgrade works. SA Water did not provide any results of odour monitoring or modelling for the site.

SA Water does not have formal standards for protection of assets from flood risk. The 1956 flood is considered the largest ever flood in South Australia's European history. Without reference to a standard for protection and the return period of the flood, it is difficult to consider that the works are required on this basis.

SA Water provided to us an email from the EPA outlining a summary of the reasons why it supports relocation of the Murray Bridge treatment plant. These reasons are:

- ▶ Short separation distance to residents of 30-40m and 6 registered odour complaints in 6 years. Also, possibility that odour complaints are under-reported because residents are used to the conditions.
- ▶ Risk of bank slumping and lagoon collapse leading to significant environmental consequences.
- ▶ Pipe for disposal of the final effluent possibly affected by geological instability.

We appreciate that these are possible drivers for relocating the treatment plant but note that SA Water has not sought to establish whether the risk it faces from these potential issues are acceptable or not and we question whether analysis would lead to this conclusion in any case. (Particularly as any geological instability is most likely during times of flood when the consequence of effluent entering the river is lower than during low flow conditions). Also, these comments are made without reference to the cost of mitigating the risks which must be balanced for the benefit of all customers. SA Water must undertake this analysis to justify the relocation.

We do not accept that expenditure is justified at this site in the timeframe proposed by SA Water. We therefore propose that this project be deferred outside of the regulatory period.

Within the regulatory period, we recognise that SA Water will require funding to undertake preliminary planning and ongoing consultation to be prepared for when the upgrade is actually required. Therefore we propose, in line with our recommendation for the Aldinga WWTP upgrade project below, that SA Water be funded for \$1.75M of investigation costs during the review period.

#### KEY DOCUMENTS REVIEWED

- ▶ CX0216-A Project Brief Murray Bridge WWTP Upgrade
- ▶ CX0216-B Murray Bridge WWTP Preliminary Plant Sizing Definition Report, KBR, March 2011.
- ▶ CX0216-C Basic layout of plant, KBR
- ▶ CX0216-D Murray Bridge Network Infrastructure Options, KBR, 2011
- ▶ CX0216-E Estimate 013-11 Murray Bridge WWTP Options Summary, Aquentia
- ▶ CX0216-F Estimate 013-11 Murray Bridge WWTP Options Details, Aquentia
- ▶ CX0216-H Murray Bridge WWTP Site Selection Report
- ▶ MB IBMS data.xlsx
- ▶ MB WWTP Email from EPA.pdf
- ▶ MB EPA Complaint details.pdf

▶ MBWWTP-Sew-Eff-Perf-ESCOSA.xlsx.xlsx

## PROJECT SUMMARY: ALDINGA WWTP - CAPACITY UPGRADE STAGE 2

### PROJECT DETAILS

<b>Project Name</b>	Aldinga WWTP – Capacity upgrade Stage 2
<b>Project Number</b>	C1709
<b>Program Name</b>	Growth – Treatment Plants

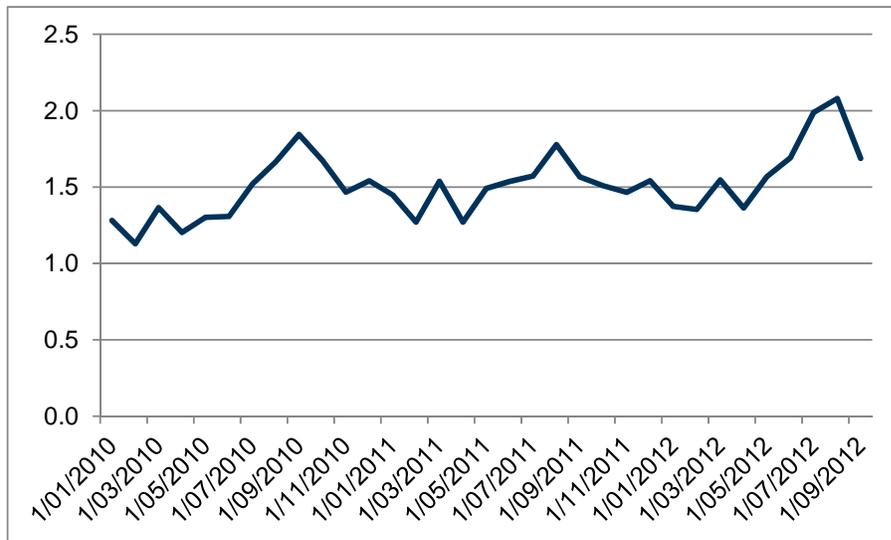
### SCHEME CONCEPT

SA Water has proposed to upgrade the hydraulic and biological treatment capacity of this treatment plant to meet increased demand.

	Expenditure (\$m)													
	Actual						Plan							
	06/07	07/08	08/09	09/10	10/11	11/12	12/13	13/14	14/15	15/16	16/17	17/18	18/19	19/20
C1709							0.250	1.250	15.000	18.500	25.377			

### OBSERVATION ON JUSTIFICATION AND SOLUTION DEVELOPMENT

SA Water informed us that, following completion of its regulatory submission, it has received more recent information that indicates that the rate of growth in the treatment plant catchment has slowed considerably. The figure below shows average monthly inflows to the plant over the last three years. While flows have increased, it appears that the most recent spike is more likely due to wet weather than population growth.



Consequently, SA Water has now proposed to defer this project by two years. Only investigation work will be undertaken in the regulatory period. SA Water considers that \$1.75M for investigation and design work will be required between 2013/14 and 2015/16.

**KEY DOCUMENTS REVIEWED**

- ▶ CX0201-E Aldinga Upgrade Project Brief C1709
- ▶ Aldinga-Sew-Flows.xlsx