Meeting Minutes

Date: Wednesday 20 June

Time: 11am

Location: St George Boardroom

Attendees John Kelly, SunWater Area Manager, Goondiwindi
Lisa Welsh, SunWater, Water Pricing Manager, Brisbane
Rohan Thorogood, SunWater, Operations Manager, St George
Wayne Curtis, SunWater, Senior Operator Maintainer, St George
Ray Stephenson, SunWater, Senior Project Manager, Brisbane
Petrina Douglas, SunWater, Customer Services Manager, Brisbane
Kym Cleary, SunWater, Customer Service Advisor, Brisbane
Bianca Barrie, SunWater, Water Accounting Advisor, Brisbane
Luke Stower, IAC Chair
Glen Rogan, IAC Member
Scott Armstrong, IAC Member

Apologies: Rob Jakins, Hamish McIntyre, Bill Knights, David Moon, Chad Prescott

Chair: Luke Stower **Minutes:** John Kelly

Item No.	Item	Presenter
1.	Welcome and Introductions	John Kelly
2.	Apologies	John Kelly
3.	Mallawa Transition Update	Luke Stower
4.	Operational and Storage Update	Rohan Thorogood and Wayne Curtis
5.	Customer Service Update	Petrina Douglas
6.	Thuraggi Outlet Update	Ray Stephenson
7.	2019 QCA Price Review	Lisa Welsh
8.	Draft 2018/19 Network Service Plan	Lisa Welsh
9.	General Business	All

Agenda Item 1 – Welcome and Introductions

The Chair opened the meeting at 2:00pm and welcomed the IAC members and thanked them for their time to attend the meeting.

Agenda Item 2 – Apologies

Rob Jakins, Hamish McIntyre, Bill Knights, David Moon, Chad Prescott

Agenda Item 3 – Mallawa Transition Update

Luke provided an update to the IAC on the transition to Mallawa Irrigation. All was on track for the transition date of 1 July 2018. Mallawa's transition manager Justin Schultz and SunWater's LMA team have been working behind the scenes to make sure all systems are in place and supported for the changeover.

SunWater advised that that it was setting up the new citrix licence to allow Mallawa Irrigation to access SunWater's Orion database (to manage customer water accounts). SunWater noted that it had attempted to set up the meter reading application on a Mallawa Irrigation iPad with no success but expect that this will be able to be resolved. SunWater had to also split some customer accounts where the customer had both a channel and river contract.

Agenda Item 4 – Operational and Storage Update

Rohan and Wayne provided an update on the Operational activities undertaken since the last meeting. See **Attachment I**.

Agenda Item 5 – Customer Service Update

SunWater provided a copy of a draft letter to go to customers regarding the unbundling of bulk water and distribution charges effective 30 June 2018. In accordance with item 8 of the Rural Water Pricing Direction SunWater were directed to amend the current water year (2017/18) Part A & Part C fixed prices. It is important to note that the prices effective 30 June 2018 for 2017/18 Part A & Part C prices added together is the same that customers have already been charged, the change only relates to the split between Part A & Part C. It was agreed that a note should be added to the draft letter indicating that Mallawa Irrigation will set Part C prices moving forward.

Action: SunWater to add a note in the draft letter advising customers that Mallawa Irrigation will set the Part C price from 1 July 2018.

The meeting discussed HP losses, charges and conversion of MP water to HP water. In terms of charges it is The Department of Natural Resources Mines and Energy (DNRWE) position that HP losses will attract the MP charge. SunWater advised that there may be impacts on share size in relation to converting HP to MP. SunWater confirmed the ROP requires HP water have a larger share size (1.75).

The meeting discussed the confusion that resulted as a result of the last flood event passed through the dam in relation to customers water accounts. The reconciliation process addressed all concerns and it was agreed that in the future it is best to read meters and undertake the reconciliation process before scrutinising water accountants as they will not reflect what they should be until after the reconciliation process.

The IAC raised some issues in relation to a larger than normal reconciliation in December 2017 (approximately 7,000ML) which caused a lot of issues for customers. SunWater agreed to look into how the reconciliation volume got to this level and how it can be managed/prevented into the future.

Action: SunWater to investigate the reconciliation volume in December 2017 (7,000ML) and report back to the IAC on what caused it and how it can be prevented in the future.

Agenda Item 6 – Thuraggi Outlet Update

SunWater provided an update on the cost sharing arrangements in relation to Thuraggi and noted that Thuraggi is currently SunWater's highest dam safety risk.

At the previous IAC meeting SunWater advised the IAC that Thuraggi costs would be considered Dam Safety Improvement Project (DSIP) costs however upon consideration it has been decided that Thuraggi does not meet the criteria for a dam safety improvement project. These projects (currently funded by SunWater's shareholders) improve the capacity of storages to safely pass floods, in line with 2003 ANCOLD requirements. The Thuraggi project is required to reinstate the ability of the outlet structure to safely pass its originally designed flow capacity and essentially the project is a maintenance project.

However, SunWater has taken on board the concerns raised by customers about the significant expenditure incurred so far to investigate the potential options to address the sand boils and put in place temporary risk mitigating measures. SunWater has undertaken an efficiency review of the expenditure undertaken so far on the Thuraggi project and identified a small amount of expenditure (less than $100K) related to the project that was not incurred efficiently (due for example to a large turnover in project managers). Notwithstanding, with hindsight it is apparent that SunWater underestimated the complexity of the project and the time it would take to complete.

SunWater acknowledged that it had not adequately kept customers informed and incorrectly advised at the last meeting that it was likely that the project would be funded as if it was a DSIP project. SunWater is reviewing its project management procedures, and in particular how it deals with dam safety-related projects to ensure opportunities to be improve efficiency are realised and embedded.

In recognition of customer concerns and opportunities to improve on the delivery of this project, SunWater intends to adjust the annuity balance to remove 50% of the expenditure (approximately $450k) incurred to date on the project. This adjustment will be shown in the final NSP. Going forward, SunWater's view is that the expenditure to rectify the sand boil is necessary to maintain the structure and should be incurred through the renewals annuity. SunWater will keep customers informed at IAC meetings with regular project updates, including expenditure projections.

The IAC asked SunWater to advise on the impact on the annuity contribution of SunWater's proposal to exclude 50% of the costs from the Annuity.

Post meeting note: SunWater has modelled the impact and advises that it results in a reduction in the cost reflective Part A price of 16c/ML in 2020/21.

SunWater provided some sketches to the IAC **(see Attachment II)** detailing the proposed long term permanent solution to the sand boil issue, that being to essentially extend the outlet conduit 40m downstream from the current location. SunWater advised the IAC that ideally, the work needs to be undertaken when the storage is low (to reduce the hydraulic gradient between the storage and the channel) and demand is low as SunWater will be unable to supply customers while the work is occurring. SunWater advised the IAC that it would be looking to do double/triple shifts i.e. work around

the clock to minimise the downtime. SunWater provided the IAC with a graph of historical performance of the storage **(see Attachment III)** which indicates the storage may be at its lowest in Jan/Feb and likely to be full again by late March. This might present an opportune time to undertake the work. SunWater sort advice from the IAC as to whether customers may be in a position to take water into their storages late in the season to facilitate the drawdown of the storage allowing the work to commence as soon as possible. SunWater will continue to supply all the customers it can from Jack Taylor Weir/St George Pump Station. The meeting agreed that SunWater should communicate the proposed plans to customers as soon as possible.

Action: SunWater to write to customers in relation to the proposed shutdown of the Thuraggi channel to undertake works to address the sand boil issue.

Agenda Item 7 & 8 - 2019 QCA Price Review and Draft 2018/19 Network Service Plan

SunWater confirmed its objectives through the pricing process were to recover its efficient costs, provide transparent consultation with customers and encourage the adoption of a light handed regulatory approach. Further, SunWater confirmed its understanding of its customer objectives, gained through consultation at the last round of IAC meetings, were as follows:

- More cost effective and better value for money services;
- More transparent costs – especially corporate costs;
- Continuing improvement of NSPs; and
- Simpler pricing.

SunWater advised that the Referral Notice was still not available however the working assumption is that 31 October 2018 will be the due date for SunWater's submission to the QCA. SunWater advised that it will advise customers when the referral notice is issued. SunWater also noted that the QCA will do some regional consultation sessions during the price review period.

SunWater provided a presentation to the IAC (shown as **Attachment IV**) detailing SunWater's total actual and forecast expenditure in terms of direct routine, direct non-routine and indirect costs compared to the QCA allowance since 2012-13 to 2023-24. Points to note include:

- Expenditure slightly above QCA targets in each year – generally as a result of increased flood repair works (unpredictable), increasing insurance costs and electricity costs.
- Forecasting a decrease in routine and non-routine direct expenditure – broadly related to St George and Dawson transfer to Local Managed Entities (LME).
- Increases in non-directs including:
  - more accurate attribution of local overhead rates rather than an average rate across the state,
  - increases in indirects due to IGEM (Inspector General Emergency Management) recommendations (downstream notifications, better information, improved hydrology and modelling, community education, emergency preparedness)
  - increases in corporate overheads partly to do with corporate systems upgrades.
- In total, SunWater spent $95m over the QCA targets, noting that $38m of this was corrective maintenance i.e. repairing flood damage.
- Electricity and insurance costs accounted for $29m.
- $20m renewals contractors – which is about what the QCA removed from SunWater's original forecast.

SunWater advised customers that it was seeking to change as little as possible and use as much from the recent QCA report on SEQWater to facilitate a low-cost price review.

1. Using 2018/19 budget for the starting point for routine costs
2. 0.2% annual cumulative productivity savings
3. Electricity – based on AEMO assumptions from SEQWater's
4. WACC – Weighted Average Cost of Capital (WACC) is used to discount the annuity payment stream and it is applied to annuity balances either as an interest cost or payment. Reduced from 7.49% to 5.9% and will be checked by QTC
5. Annuity – SunWater have included a 30 year annuity (increased from 20 years), more in line with other long-life infrastructure businesses.
6. DSIP (Dam Safety Improvement Project) – where relevant. 50% of the current costs if no detailed business case yet completed.
7. Recreation area costs excluded from 2020/21
8. Fixed/variable costs: we have simplified this and standardised across all service contracts.
    a. Insurance and all non-routine costs are 100% fixed.
    b. Electricity is allocated 100% to variable.
    c. 10% of operations, revenue offsets and routine maintenance to variable.

SunWater noted that actual prices will be an output of the QCA review and the referral notice.

SunWater provided the IAC with further scheme specific detail in relation to forecast revenues and cost allocations from 2018-19 to 2023/24 including a graph comparing indicative medium priority prices to cost reflective prices.

SunWater provided the IAC members with a copy of the Draft NSP **(Attachment V)** for the scheme and encouraged members to provide any comments. SunWater advised that changes to the NSP's were made in response to feedback from customers which included:

- Keep the NSP's short
- Split out non-direct costs
- Include DSIP/cost table
- Provide 5 years of expenditure forecasts
- Provide cost/price reflectivity

SunWater advised the IAC that there may be some possible changes in the final NSP's as a result of:

a. Review of corporate costs (review step changes down to overheads, allocation of labour to direct)
b. Final update of renewals projects (minimal)
c. Updated insurance costs based on market outcome
d. Step change down in Brisbane rental costs
e. QTC minor corrections to WACC.
f. Potential adjustments to inefficient projects.
g. Working with QCA to confirm entitlement and usage data for prices.

SunWater's submission may also change compared to the NSP, because of delays in the referral notice, as a result of:

- 2017/18 actuals – will affect annuity balances
- WACC market rates
- Ongoing review of renewals

- QCA costs if available
- The QCA review itself will impact on SunWater allowed costs and therefore prices.

The IAC noted that they do not have any issues with the proposed routine costs as detailed in the NSP (Operations, Corrective, Preventative) however a better understanding is required of the non-routine costs and in particular those related to dam safety activities.

Action: SunWater to provide further detail on dam safety related non-routine jobs planned to occur in the next 5 years.

Post meeting note: Details of Dam Safety Annual inspection, Comprehensive inspections, Dam Safety reviews and Comprehensive risk assessments are provided in **Attachment VI**

The IAC requested further detail in relation to the non-routine projects that were used to compile Figure 4 in the NSP.

Action: SunWater to provide further detail on the long term R&E program at the next IAC meeting.

Agenda Item 9 – General Business

There were no further items of General business

Meeting closed: 1pm

OPERATIONAL UPDATE

June 2018

WORKS APRIL - JUNE

- Thuraggi channel sprayed for smart weed to avoid flow restrictions.
- Damaged gearbox on Moolabah Weir Gate refurbished.
- Buckinbah Pumps. First refurbished pump making metallic noises. Contractor will visit site. Second pump in transit.
- Multiple erosion protection works around structures in distribution area.
- Beardmore Dam level has fallen to below 75% of capacity. As a result, Moolabah Weir has been returned to its original operating level.
- Gear oil in all lay flat gate structures being changed.

STAFFING ARRANGEMENTS

- Amanda Hicks to move from permanent part time to full time under Mallawa Irrigation.
- Wayne Curtis and Cameron May have completed the first of three blocks of training towards Certificate 3 in Bulk Water Distribution.
- Cohen Nunn has successfully completed has three month probation period.

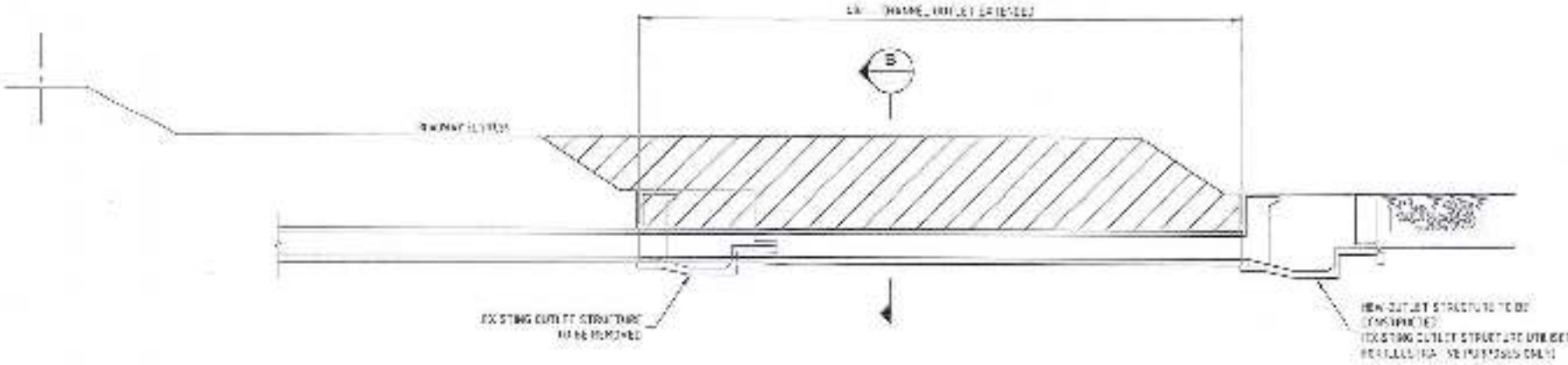
REFURBISHED MOOLABAH GATE GEARBOX

BUCKINBAH PUMP NUMBER 1 INSTALL - JANUARY

RESULTS OF THURAGGI SPRAYING

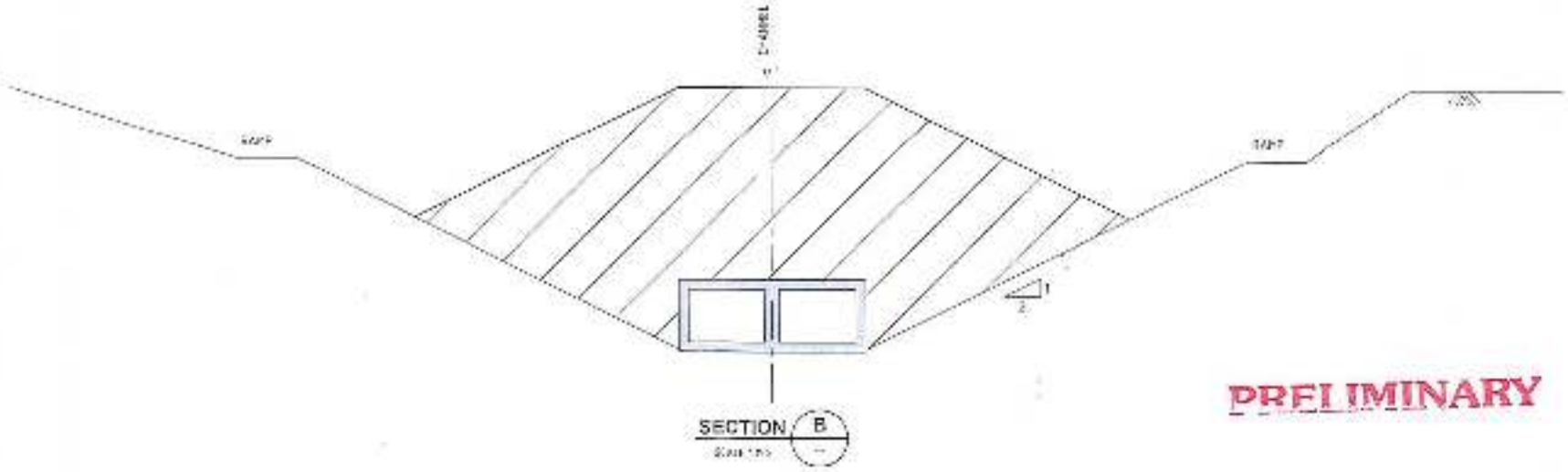
EROSION PROTECTION WORKS (CHANNEL 1)

EROSION PROTECTION WORK (CHANNEL 2)



PROPOSED ARRANGEMENT

SECTION



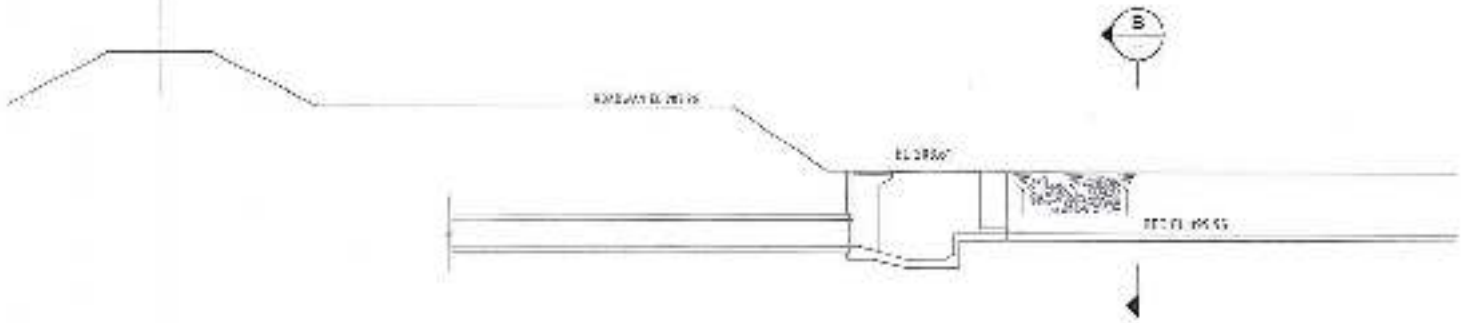
PRELIMINARY

SCALES (A3 SIZE)

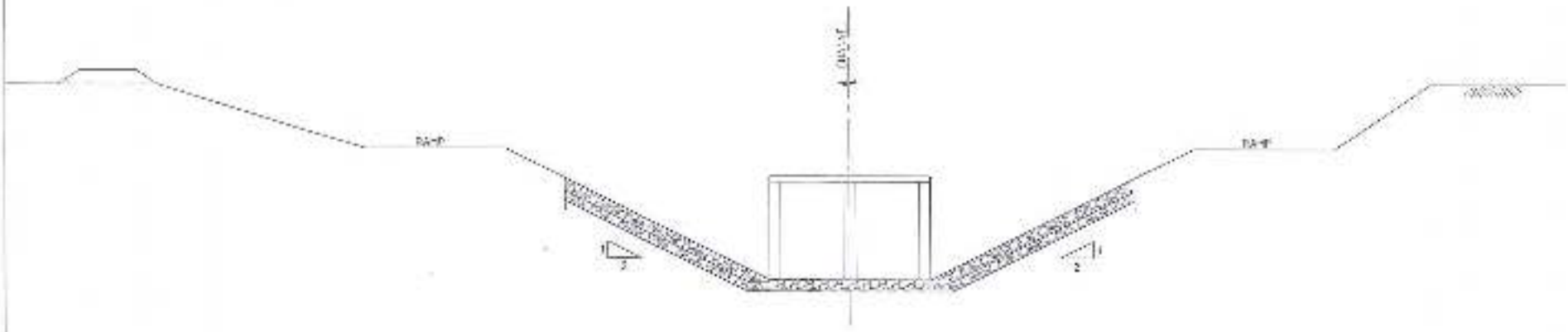
SunWater

BEARDMORE DAM
IRRIGATION OUTLET - THURAGGI CHANNEL
UPGRADE - SKETCH

A



EXISTING ARRANGEMENT
SECTION



SECTION B

PRELIMINARY

SunWater

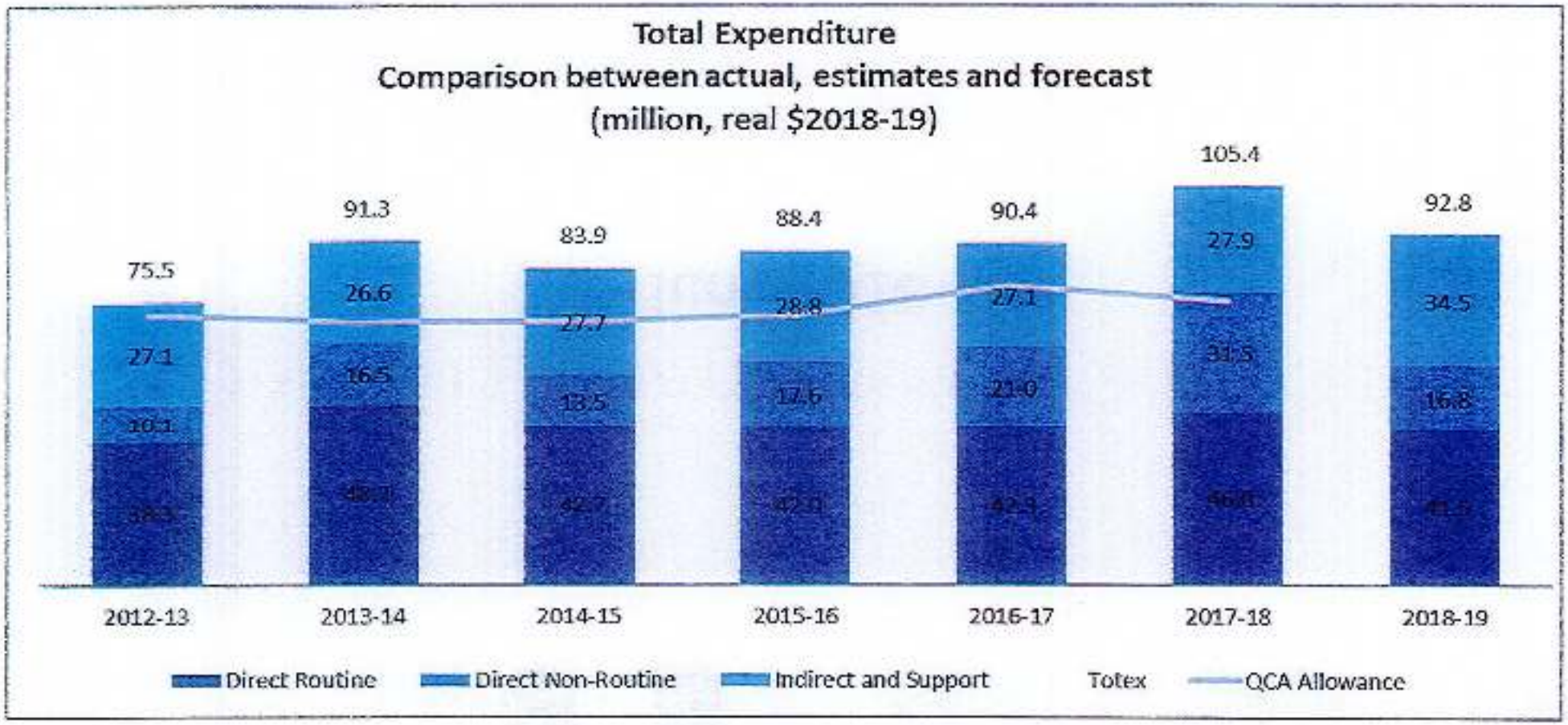
BEARDMORE DAM
IRRIGATION OUTLET - THERAGGI CHANNEL
UPGRADE - SKETCH


Click to show/hide
2011
2012
2013
2014
2015
2016
2017
2018

Supporting information to Draft NSPs

June 2018

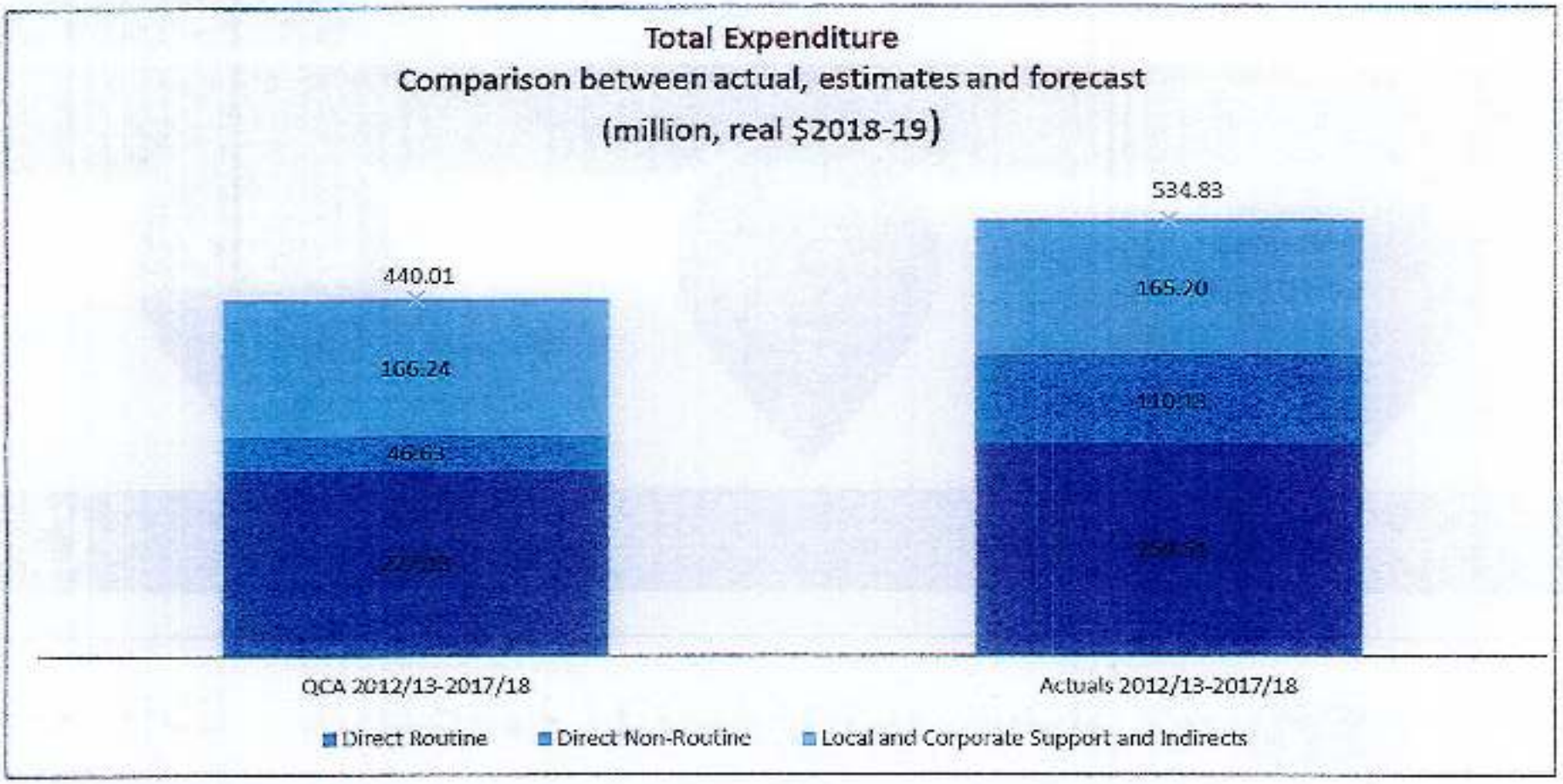
Total Expenditure Performance



How are SunWater's costs allocated to each service contract? (Cost Allocation Methodology)

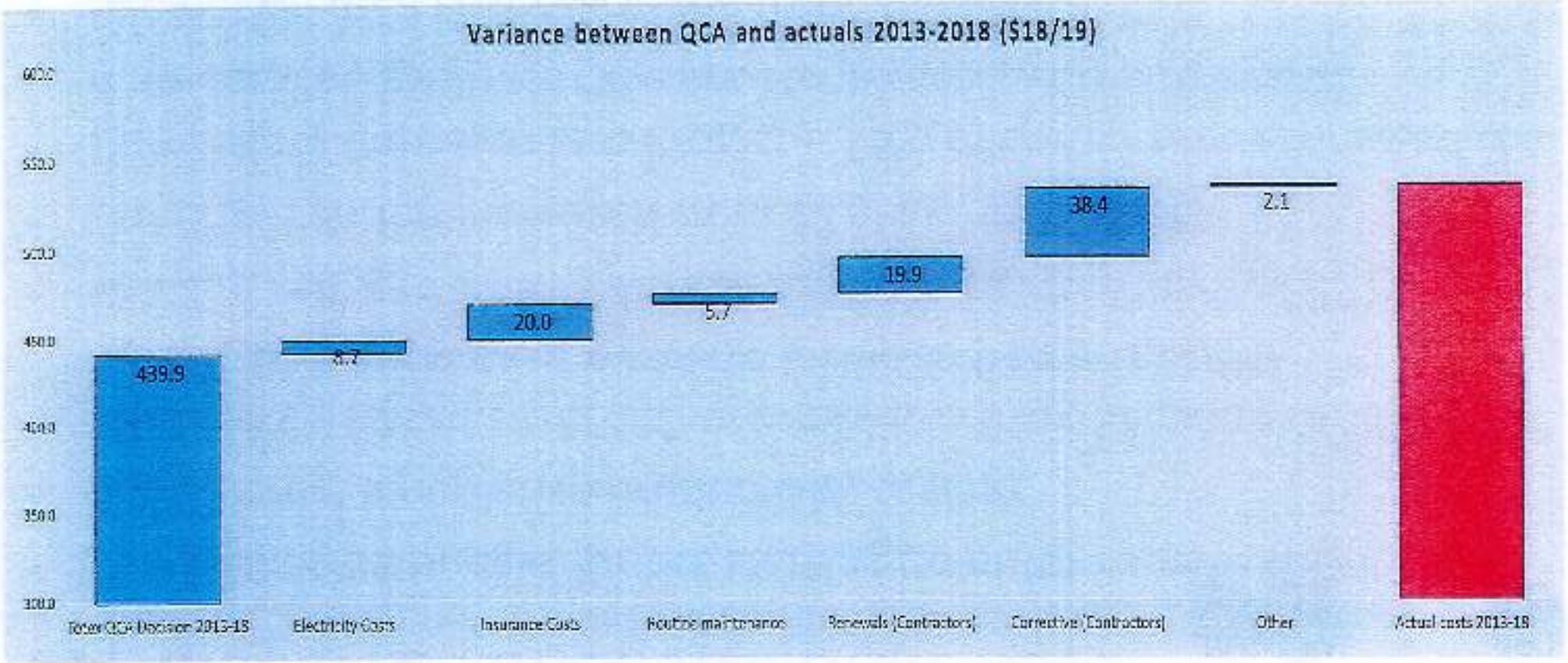
DRAFT

Total Expenditure Comparison by cost type: Target/actual



* 2017/18 based on budget

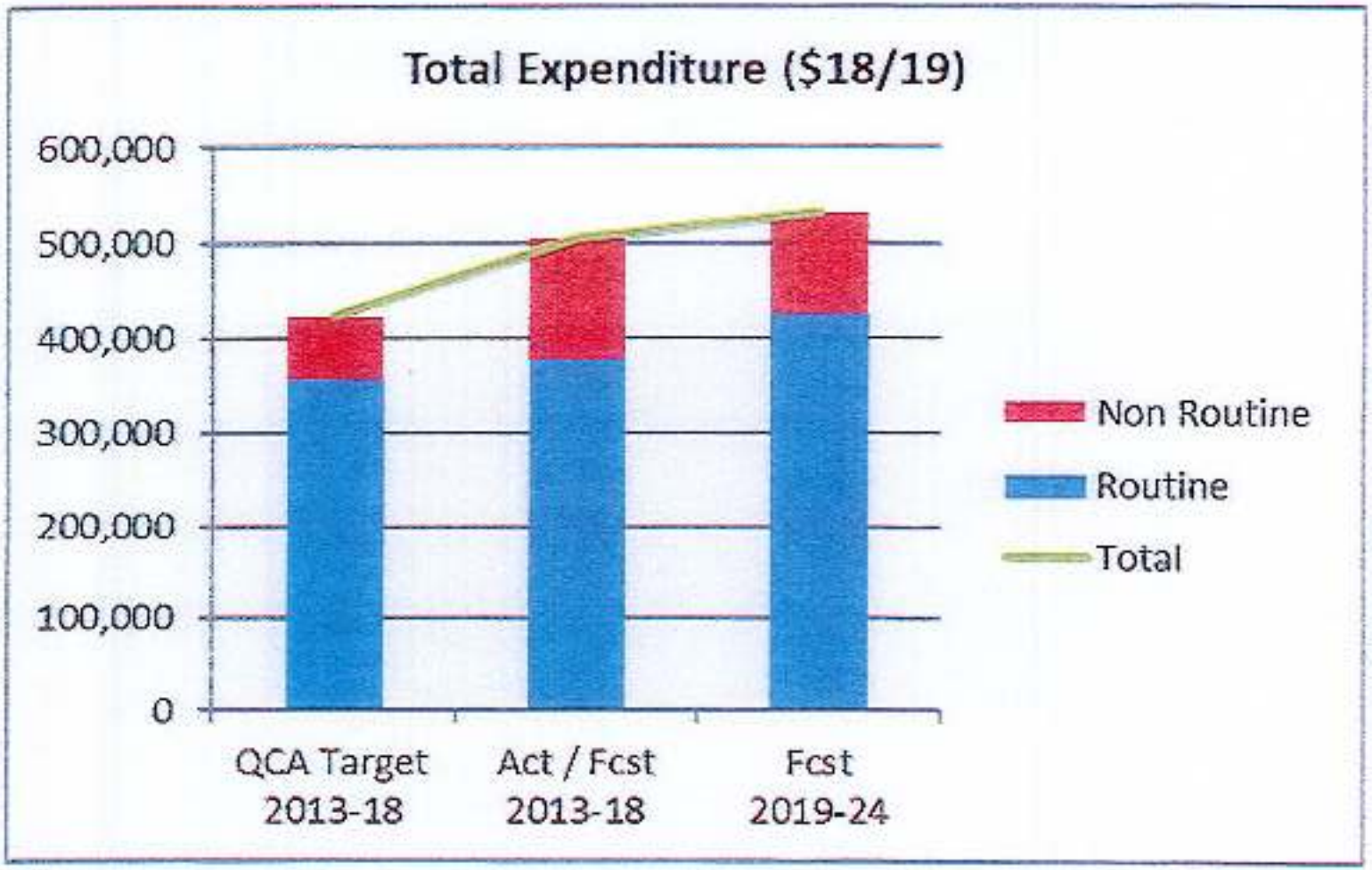
Variance from QCA targets 2013-18 by activity



Key Global Assumptions: Draft NSPs

- Using 2018/19 budget for the starting point for routine costs
- 0.2% annual cumulative productivity savings
- Electricity – based on AEMO assumptions from Seqwater's QCA price review, plus impacts of obsolete tariffs (scheme specific)
- WACC – reduced from 7.49% to 5.9% (being checked by QTC)
- Annuity – period increased from 20 years to 30 years
- Dam Safety Improvement Project – 50% of the current estimated costs if no detailed business case yet completed (where relevant)
- Recreation area costs excluded from 2020/21
- Standardisation of fixed/variable cost allocation across all schemes.
  - Insurance and all non-routine costs are 100% fixed.
  - Electricity is allocated 100% to variable
  - 10% of operations, revenue offsets and routine maintenance to variable.

Total Expenditure: target/actual/forecast



* Totals Excludes Dawson and St George Distribution for comparative purposes

2018/19 to 2023/24 Network Service Plan

St George Bulk Water Service Contract

11 June 2018

Consultation Draft

www.sunwater.com.au

Contents

Our plan for St George

We're focused on reliability, efficiency and safety, ensuring through ongoing consultation that the St George Bulk Water Service Contract continues to meet the needs and expectations of our diverse customer base.

In this Network Service Plan (NSP) we outline a range of proposed immediate refurbishment and longer-term improvement projects, and provide a detailed breakdown of anticipated costs for review.

Our focus during the 2018/19 to 2023/24 NSP period will be on ensuring dam safety compliance is maintained and that refurbishment and corrective work identified through annual and five yearly comprehensive inspections at Beardmore Dam and Jack Taylor Weir are implemented safely, timely and efficiently. We will be continuing to replace customer meters on an as needs basis to ensure our customers have accurate water metering in place.

In the immediate future, works have also been scheduled to address the sand boils in Thuraggi Channel to ensure the ongoing safety and reliability of Beardmore Dam. Together with continuing to implement an efficient and effective preventative maintenance program, we are focused on ensuring the Service Contract's assets continue to perform reliably.

It is important to us that our customers are consulted in making important decisions. We welcome and encourage your feedback on this NSP, and look forward to working with you to deliver the programs of work.

John Kelly
Area Operations Manager South

1. Introduction

A Network Service Plan details a range of proposed immediate and longer-term improvement projects, and provides a detailed breakdown of anticipated costs for review.

NSPs are an important part of our asset management framework, feeding into our strategic asset management and corporate strategic plans, as illustrated in ***Appendix 1***.

The purpose of this year's NSP is twofold:

1. to consult with customers on routine and non-routine expenditure throughout the coming financial year
2. to present to customers SunWater's projected efficient costs for the five year period from 2018/19 to 2023/24.

In particular, the NSP covers:

- past performance for routine and non-routine expenditure
- forecast routine and non-routine expenditure for 2018/19 to 2023/24
- the long-term outlook for material non-routine expenditure.

In this NSP, the focus of consultation is the draft budget figures for 2018/19 and thereafter. We have retained prior year actual results in ***Appendix 2*** for reference, as requested by customers.

Input from customers is a valuable part of SunWater's planning processes and ensures that we invest in areas which support the services we provide to customers. Figure 1 below shows how SunWater and customers work together in relation to NSPs. SunWater has consulted with the Irrigator Advisory Committee (IAC) on the draft NSP and feedback from the Committee has been considered and incorporated where appropriate.

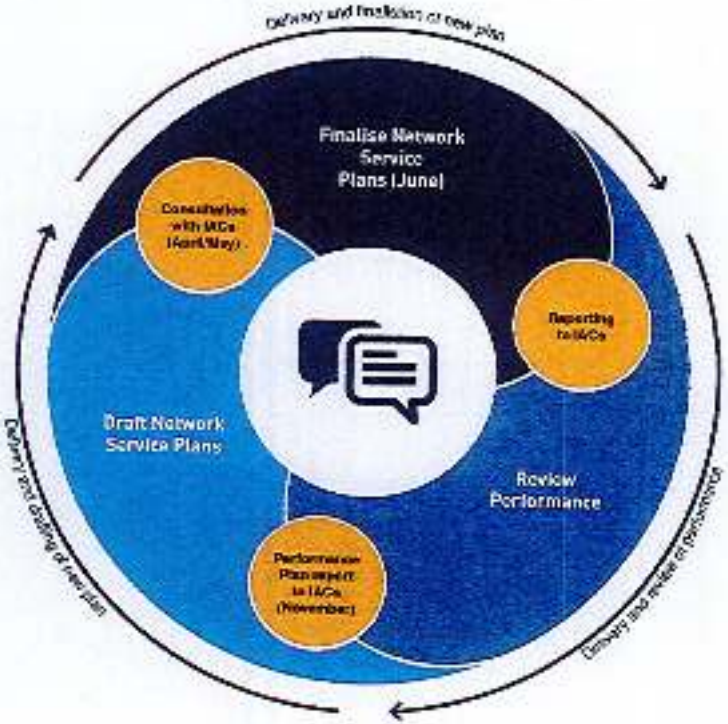
To have your say and shape future NSPs, please contact us via email or post:

Email: nspfeedback@sunwater.com.au

Post: NSP Feedback
PO Box 15536 City East
Brisbane Qld 4002

We consider and respond to all submissions, publishing all responses on our website.

Figure 1: Customer consultation and Network Service Plans



2. Delivering services to customers

At SunWater we are committed to working collaboratively with our customers to deliver value and fit-for-purpose water solutions. SunWater's Customer Service Commitment can be viewed at: www.sunwater.com.au

2.1 Our customers

The majority of our 169 customers in this Service Contract are irrigators with crop types including cotton, wheat, grapes, peanuts, carrots, mung beans, chickpeas, onions and other small crops. Water is also supplied to the town of St George and industrial users, including an abattoir and tourist accommodation.

The water entitlements for each customer segment are shown in Table 1.

Table 1: Water entitlement and usage data

Customer Segment	Total Water Entitlements (ML)	High Priority Water Entitlements (ML)	Medium Priority Water Entitlements (ML)	Water Deliveries 2016/17 (ML)
Irrigation[1]	81,471	3000	78,471	86,879
Urban	3024	0	3024	1336
Industrial	60	0	60	4
SunWater[1]	20	0	20	130
Total	**84,575**	**3000**	**81,575**	**88,349**

1. Pending confirmation of new local management entity arrangements.

The 2018/19 charges and cost per megalitre are shown in Table 2. The St George Bulk Water Service Contract does not need additional subsidies to recover irrigation's share of future renewals, maintenance and operating costs. For the full suite of charges that apply, refer to SunWater's website.

Table 2: Irrigation charges for 2018/19[1]

Product		2018/19 ($/ML)	Cost ($/ML)[2]	Subsidy ($/ML)
Bulk water customers				
Medium Priority Allocation Charge	Bulk Water Charge – Part A (fixed charge based upon entitlement)	21.38	19.28	N/A
Medium Priority Allocation Water	Bulk Water Charge – Part B (variable charge based upon usage)	1.34	1.46	0.12
Bulk water customers who are also customers of a distribution system				
Medium Priority Allocation Charge	Bulk Water Charge – Part A (fixed charge based upon entitlement)	20.35	19.28	N/A
Medium Priority Allocation Water	Bulk Water Charge – Part B (variable charge based upon usage)	1.34	1.46	0.12

1. This table includes bulk water charges only. From 1 July 2018 distribution charges will be the responsibility of Mallawa Pty Ltd.
2. Costs reflect lower bound cost recovery ie recovery of future replacement and ongoing maintenance and operations. Charges do not allow for any returns on existing assets.

2.2 Service targets

SunWater and customers have agreed Water Supply Arrangements and Service Targets for the St George Bulk Water Service Contract.

Table 3 below sets out our performance in 2016/17 against the service targets for: issuing notification of planned shutdowns; the duration of unplanned shutdowns; and the frequency of interruptions to supply.

In addition, SunWater will be setting targets for the time it takes to resolve complaints and will be able to report our performance against these targets in future NSPs.

Table 3: Service targets and performance

Service target		Target	Number of exceptions 2016/17
Planned shutdowns – notification	For shutdowns planned to exceed 2 weeks	8 weeks	0
	For shutdowns planned to exceed 3 days	2 weeks	0
	For shutdowns planned to be less than 3 days	5 days	0
Unplanned shutdowns – duration[1]	Unplanned shutdowns during Peak Demand Period	48 hours	0
	Unplanned shutdowns outside Peak Demand Period	5 working days	
Maximum number of interruptions[2]	Planned or unplanned interruptions per water year	6	0

1. This is the number of times that the unplanned shutdown has exceeded the shortest of the peak/off peak periods.
2. This is the total number of bulk and distribution customers in the scheme that have been interrupted in excess of the target.

3. Financial summary – revenue and expenditure

All financial figures in this report are presented in nominal dollars.

A high-level summary of the budgeted financial performance of the St George Bulk Water Service Contract is presented in Table 4.

The revenue SunWater receives from urban and industrial customers is agreed by term contract. The revenue we receive from irrigation customers is determined by the Queensland Government based on recommendations made by the Queensland Competition Authority (QCA) as part of its review of irrigation charges and is intended to allow SunWater to recover its prudent and efficient costs of operating the Service Contract.

SunWater anticipates an increase in revenue for the St George Bulk Water Service Contract in 2018/19.

In 2018/19, SunWater plans to increase routine and non-routine expenditure for the St George Bulk Water Service Contract, with a focus on projects that improve efficiency and performance, and allow us to deliver the best possible service to our customers. This will continue to be our focus throughout the upcoming price path period.

Further detail on the planned spend and annuity revenue is outlined on subsequent pages of this NSP and a further breakdown of expenditure by type can be found in ***Appendix 2***.

Table 4: Service contract financial summary[1]

St George Service Contract	2014/15 Actual $'000	2015/16 Actual $'000	2016/17 Actual $'000	2017/18 Estimate $'000	2018/19[2] Forecast $'000
Revenue					
Irrigation	347.7	355.8	364.6	377.8	1845.0
Community Service Obligation	-	-	-	-	-
Industrial[3]	6.2	6.2	6.3	6.5	6.6
Urban[3]	176.1	179.1	181.9	185.2	189.9
Revenue transfers[4]	1004.7	1090.6	1135.4	1126.2	-
Drainage	-	-	-	-	-
Other	(16.8)	4.0	3.6	5.0	5.0
Insurance proceeds flood	-	-	-	-	-
Revenue Total	1517.8	1635.8	1691.9	1700.8	2046.5
Less – Routine expenditure	(782.8)	(804.1)	(739.5)	(927.4)	(1232.6)
Less – Non-routine expenditure					
Annuity funded	(497.8)	(770.1)	(1315.1)	(574.0)	(1592.3)
Non annuity funded[5]	-	(0.4)	-	-	-
Surplus (deficit)	237.1	(38.8)	(362.7)	199.3	(778.4)

1. Totals may not add due to rounding.
2. SunWater's 2018/19 budget figures are draft as at the time of consultation. These figures will not be locked down until late in the financial year prior.
3. Forecast revenues for industrial and urban customers are based on current contractual arrangements.
4. Revenue transfers represent the cost of bulk water supplies delivered through the St George distribution system. The revenue accrues to the distribution system before it is transferred to the Bulk Water Service Contract as a contribution to the cost of the bulk water service. The QCA established the transfer cost for irrigation supplies at the cost reflective bulk water tariff. From 1 July 2018, due to the transfer of the St George distribution system to Mallawa Pty Ltd, revenue transfers will be nil and instead appear as revenue from irrigation.
5. This is expenditure which has not been funded by irrigation customers.

As part of our commitment to transparency, Figure 2 and Figure 3 show a high-level breakdown of total Service Contract costs. The item 'Annuity Contribution' refers to the annualised renewals annuity component of the Service Contract's total costs.

Figure 2: Breakdown of total service contract costs – 2018/19 forecast

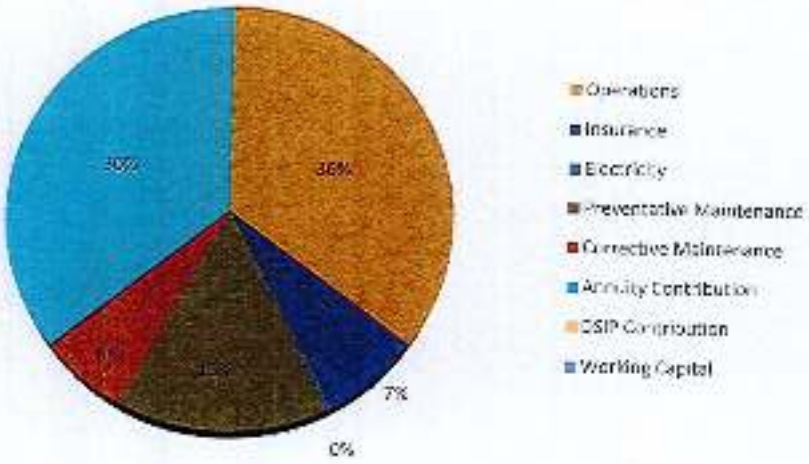
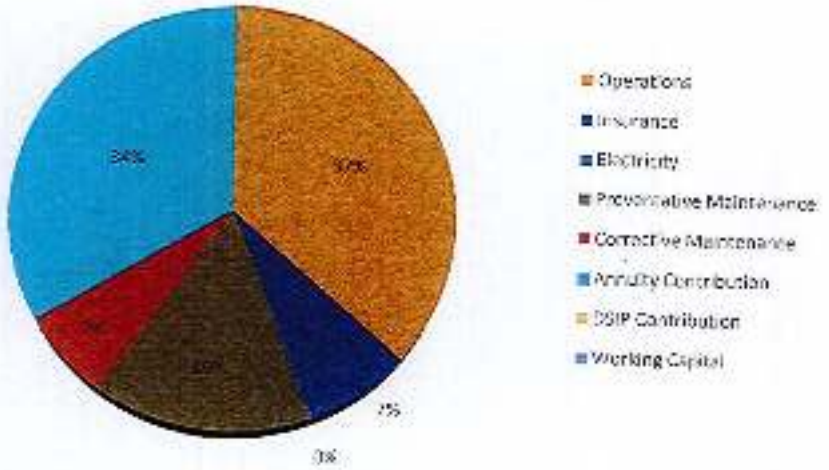


Figure 3: Breakdown of total service contract costs – 2019/20 to 2023/24 forecasts



4. Cost of delivering services – routine expenditure

Routine (or annual) expenditure includes funds for operations activities (operations, electricity and insurance), preventative maintenance and corrective maintenance.

SunWater has budgeted an increase in St George Bulk Water Service Contract's routine operating expenditure in 2018/19 (refer to Table 5). SunWater's proposed budgets for routine operating expenditure for 2019/20 to 2023/24 are also presented in this table. From 2019/20, SunWater has built into forecast costs an efficiency saving of 0.2 per cent every year (cumulative).

The data presented in Table 5 includes direct expenses and a share of local area support costs, indirect costs and corporate support costs. For a more detailed breakdown and explanation of these costs, refer to ***Appendix 2***.

Table 5: Routine operating expenditure[1,2]

	2016/17			2017/18[3]		2018/19[3]		2019/20	2020/21	2021/22	2022/23	2023/24
St George Service Contract	SunWater Actual $'000	QCA Recommended $'000	Variance $'000	SunWater Estimate $'000	2016/17 QCA Recommended (adjusted) $'000	SunWater Forecast $'000	2016/17 QCA Recommended (adjusted) $'000	SunWater Forecast $'000	SunWater Forecast $'000	SunWater Forecast $'000	SunWater Forecast $'000	SunWater Forecast $'000
Electricity	7.5	11.1	(3.6)	6.5	11.4	6.0	11.6	6.0	5.9	6.1	6.3	6.2
Insurance	114.4	43.8	70.6	114.4	44.9	137.0	46.0	140.2	143.4	146.7	150.1	153.5
Operations	313.6	637.3	(323.7)	567.7	653.2	680.6	669.6	684.2	702.2	720.8	739.8	759.3
Operations Total	**435.5**	**692.2**	**(256.7)**	**688.5**	**709.5**	**823.7**	**727.2**	**830.4**	**851.6**	**873.6**	**896.1**	**919.0**
Preventative maintenance	282.0	234.0	48.0	142.1	239.8	288.1	245.8	288.6	297.2	305.0	313.0	321.2
Corrective maintenance	22.0	144.5	(122.5)	96.8	148.1	120.8	151.8	121.5	124.7	127.9	131.3	134.7
Routine Total	**739.5**	**1070.7**	**(331.2)**	**927.4**	**1097.5**	**1232.6**	**1124.9**	**1241.4**	**1273.4**	**1306.5**	**1340.4**	**1374.9**

1. Totals may not add due to rounding.
2. SunWater's 2018/19 to 2023/24 budget figures are draft as at the time of consultation. These figures will not be locked down until late in the financial year prior.
3. For 2017/18 and 2018/19 SunWater has indexed and reported against the 2016/17 QCA recommended costs adjusted for inflation which was assumed to be 2.5%.

4.1 Operations

St George Bulk Water Service Contract's total operations budget in 2018/19 is 13.26 per cent above the QCA's recommended costs (adjusted for inflation). This variance is largely due to higher insurance costs than what the QCA forecast.

For further detail on what is included in operations expenditure, refer to ***Appendix 3***.

Electricity

One of the key challenges for SunWater is managing the cost of electricity. SunWater is therefore targeting several initiatives over the next 24 months to help manage these costs, including:

- annual tariff reviews to match electricity usage with the best electricity tariff
- testing the contestable market for potential savings
- ensuring our assets are operating as efficiently as possible
- operational management of usage to reduce the impact of demand charges.

Insurance

Insurance is one of SunWater's largest expenditure items and these costs have increased significantly in recent years due to multiple flood events in Queensland, global insurable events impacting premiums and the need to obtain coverage for new risks, such as cyber. Although SunWater is subject to market forces in the pricing of insurance premiums, we have also been actively managing insurance premium costs by reviewing coverage levels and policy specifications including deductibles to ensure that our insurance coverage is appropriate and reflective of the risks faced by our business.

Although insurance premiums are forecast to increase globally in 2018/19, SunWater is forecasting a reduction in our insurance costs in 2018/19 as a result of the review of our insurance coverage. The reductions are higher in distribution service contracts as these are less likely to be impacted by future flood events than bulk water service contracts. SunWater's revised insurance coverage is currently being tested with the insurance market and will be revised based on the outcome of this process before the 2018/19 NSPs are finalised.

4.2 Preventative maintenance

Preventative maintenance underpins the ongoing operational performance and service capacity of St George Bulk Water Service Contract's physical assets.

Preventative maintenance is cyclical in nature with a typical interval of 12 months or less, however, the intervals can be longer. St George Bulk Water Service Contract's preventative maintenance for 2018/19 is budgeted to be 17.18 per cent above the QCA's recommended costs (adjusted for inflation). Preventative maintenance expenditure is returning to trend from an abnormally low base in 2017/18.

For more information on what is included as preventative maintenance, refer to ***Appendix 3***.

4.3 Corrective maintenance

Corrective maintenance is identified in several ways including:

- through the performance of preventative maintenance
- operation of assets and equipment
- operational inspections where defects are identified
- through continuous monitoring by control systems, hazard inspections, safety audits and from incident and accident investigation outcomes.

Corrective maintenance includes activities to correct unexpected failures or to return an asset to an acceptable level of performance or condition. While these are difficult to forecast with accuracy, history has shown that such events can be expected and need to be factored into expenditure forecasts. SunWater conducts two types of corrective maintenance: scheduled and emergency.

Corrective maintenance expenditure forecasts include provision for labour, materials and plant hire, but do not include costs of damage arising from major unexpected events, such as floods. These costs are categorised as non-routine corrective maintenance, which is discussed in the following section.

St George Bulk Water Service Contract's corrective maintenance for 2018/19 is budgeted to be 20.41 per cent below the QCA's recommended costs (adjusted for inflation).

Scheduled corrective maintenance

Scheduled corrective maintenance is maintenance that can be planned and scheduled. For a list of what this typically includes, refer to ***Appendix 3***. This work is managed on a risk and priority basis with as much forward planning as possible to cater for pricing cycles.

Emergency corrective maintenance

Emergency corrective maintenance (or breakdown maintenance) includes works required to restore system supply and capacity or equipment operation after an unplanned event. It is carried out immediately to restore normal operation or supply to customers or to meet regulatory obligations (eg rectify a safety hazard). For a list of what this typically includes, refer to ***Appendix 3***.

5. Cost of delivering services – non-routine expenditure

SunWater's approach to managing non-routine expenditure is underpinned by the concept of 'optimised life cycle cost', which seeks to optimise capital outlays and ongoing maintenance spend.

Our whole-of-life asset replacement and maintenance strategy looks at the risk and condition of each asset and uses this information to estimate the future work required to ensure it will continue to provide the required level of service into the future.

Having up-to-date knowledge of asset conditions is essential to this process. Information from our continuous program of asset inspections and condition assessments feeds into the annual review of the renewals program.

Non-routine expenditure is funded via an annuity. This expenditure could be capital or operating expenditure. The annuity approach acknowledges a long-term view of renewals spend and seeks to reduce the burden on future generations of water users.

The QCA applied a 20 year planning period for the purpose of calculating the 2012/13 to 2016/17 renewals annuity. For 2018/19 to 2023/24, SunWater is proposing to adopt a 30 year planning period. Our forecast annuity funded non-routine expenditure presented in Table 6 and elsewhere in this NSP reflects this proposal.

While the immediate program for the 2018/19 budget is well defined, estimates become more uncertain further into the planning timeline. As such, the program of works is not a specific forecast of when individual projects are expected to be executed, but rather a portfolio-level estimate based on the best available risk and condition information for the Service Contract as a whole.

At SunWater, we focus on ensuring our assets are maintained to the required standard at the lowest cost. Our review of the renewals profiles also extends to considering the key asset replacement assumptions so that the profile better reflects likely spend each year and moves away from assuming assets are replaced at end of standard life, based on their replacement costs.

Table 6 sets out our non-routine annuity and non-annuity funded expenditure. Non-routine annuity expenditure is greater than the QCA forecasts in 2016/17 and 2018/19 as a result of unplanned works at Thuraggi Channel. During repair works in Thuraggi Channel in June 2015, sand boils and substantial seepage from beside the outlet training walls were observed.

SunWater carried out a number of investigation works and testing in 2016/17 to identify the source and pathway of seepage, and to determine the extent of the saturated sands. Following this, we completed an options study in 2017/18 to develop a possible long-term solution. This study recommended the extending of the outlet culvert downstream.

A temporary raising of Moolabah Weir located downstream of the outlet structure was undertaken in November 2017 to address the sand boil issue. This involved the bolting of half box culvert units to the concrete crest of the weir. A long-term solution to the sand boil issue will be implemented in 2018/19. Works will include increasing the length of the outlet channel and twin conduits about 40 metres downstream.

Details of the major non-routine projects planned for the period from 2018/19 to 2023/24 are set out in ***Appendix 4***.

Table 6: Non-routine expenditure[1]

St George Service Contract	2016/17			2017/18[2]		2018/19[2]		2019/20	2020/21	2021/22	2022/23	2023/24
	SunWater Actual $'000	QCA Recommended $'000	Variance $'000	SunWater Estimate $'000	QCA Forecast $'000	SunWater Forecast $'000	QCA Forecast $'000	SunWater Forecast $'000	SunWater Forecast $'000	SunWater Forecast $'000	SunWater Forecast $'000	SunWater Forecast $'000
Annuity funded												
Operations	98.3	-	98.3	7.6	-	10.0	-	-	-	-	-	-
Preventative maintenance	-	-	-	-	-	-	-	-	-	-	-	-
Corrective maintenance (flood)	-	-	-	-	-	-	-	-	-	-	-	-
Renewals	1216.7	542.4	674.4	566.4	593.5	1582.4	71.5	520.6	186.4	469.3	529.7	190.2
Non-routine total	**1315.1**	**542.4**	**772.7**	**574.0**	**593.5**	**1592.3**	**71.5**	**520.6**	**186.4**	**469.3**	**529.7**	**190.2**
Non annuity funded												
Non annuity funded	-			-		-		-	-	-	-	-

1. Totals may not add due to rounding.
2. The QCA Forecast for 2017/18 and 2018/19 are based upon the modelling undertaken by the QCA as part of the 2012 irrigation pricing review.

6. Annuity balance

Annuities are managed by SunWater on behalf of each Service Contract. They allow for customer charges to reflect a constant amount necessary to recoup the costs of refurbishment/rehabilitation of the assets over a pre-determined period of time. The forecast annuity balances, and the impacts of budgeted non-routine spend, are shown in Table 7 below.

The QCA and SunWater closing balances will differ due to differences in the expenditure profile allowed by the QCA in 2012 and actual expenditure incurred by SunWater between 2012/13 and 2018/19. For example, as highlighted above, SunWater incurred expenditure for unexpected works on the Thuraggi Channel.

Table 7: Annuity balance[1]

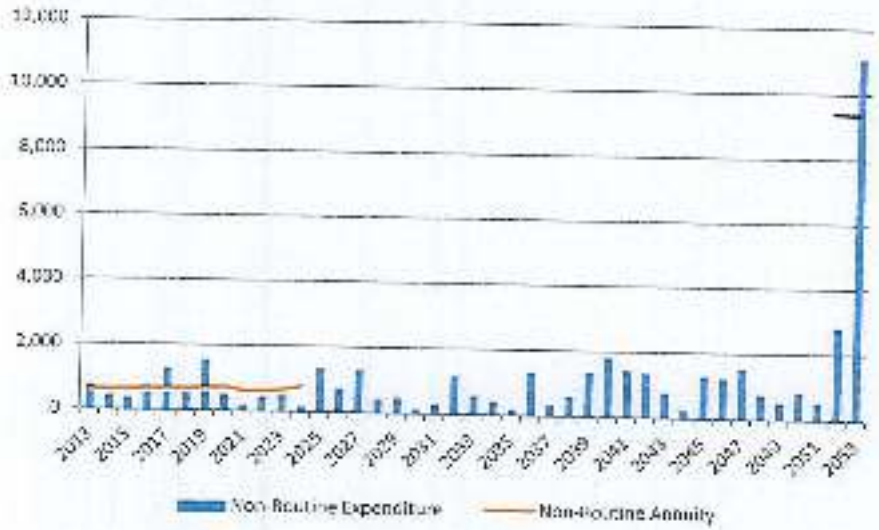
St George Service Contract	2016/17 Actual $'000	2017/18 Estimate $'000	2018/19 Forecast $'000	2019/20 Forecast $'000	2020/21 Forecast $'000	2021/22 Forecast $'000	2022/23 Forecast $'000	2023/24 Forecast $'000
Annuity								
Opening balance[2]	290.3	(346.0)	(272.5)	(1195.0)	(1117.4)	(764.9)	(666.4)	(591.8)
Spend	(1315.1)	(574.0)	(1592.3)	(520.6)	(186.4)	(469.3)	(529.7)	(190.2)
Insurance proceeds receipts (if applicable)								
Prior year	-	-	-	-	-	-	-	
Current year	-	-	-	-	-	-	-	-
Annuity contribution[3]	657.0	673.4	690.3	707.5	604.8	612.9	643.6	754.8
Interest/financing costs	21.7	(25.9)	(20.4)	(89.5)	(65.3)	(45.1)	(39.3)	(34.9)
SunWater – Closing Balance	**(346.0)**	**(272.5)**	**(1195.0)**	**(1097.6)**	**(764.9)**	**(666.4)**	**(591.8)**	**(62.1)**
QCA – Closing Balance	**2198.9**	**2438.3**	**3239.7**					
Difference	(2540.0)	(2710.8)	(4434.7)					

1. Totals may not add due to rounding.
2. The difference in the closing balance for 2019/20 and the opening balance for 2020/21 relates primarily to expenditure incurred prior to the start of the 2012 price path. For example, flood repairs associated with an insurance claim that were still outstanding in 2012. These amounts have been carried forward to 2020/21 so that they can be considered as part of the QCA's review of expenditure for the new irrigation price review.
3. The annuity contribution is included in the prices paid by customers. It was set by the QCA for 2012–2017 and is rolled forward with CPI for 2017/18, 2018/19 and 2019/20. Thereafter the annuity contribution is based upon SunWater's forecast and will be included as part of SunWater's submission to the QCA for the upcoming price review.

6.1 Overview of annuity-funded, non-routine projects to 2052/53

The estimated renewals expenditure out to 2052/53 is shown in Figure 4 below.

Figure 4: Annuity expenditure to 2052/53 ($'000)



The renewals annuity presented above is calculated over a 30 year planning period, with projects forecast to occur up to 2052/53 affecting the renewals annuity. The greater the value of the project, the more significant impact upon the renewals annuity.

To be transparent and to ensure that customers have input into projects likely to impact the renewals annuity, SunWater identifies material renewals projects in the NSPs.

A project is currently considered 'material' when its value is greater than 10 per cent of the value of the Service Contract over the five year price path period.

Material renewals projects are listed in ***Appendix 5***.

6.2 Options assessment

SunWater is committed to maintaining assets that are fit for service with the lowest possible lifecycle cost.

In response to a recommendation from the QCA in 2012, SunWater has been preparing options analyses for all material renewals projects within the planning period. SunWater now has the benefit of learnings, having applied this approach for number of years, and has reflected and considered whether it is the most efficient approach or whether there is another way to approach this which provides customers with reassurance that SunWater's renewals expenditure is prudent and justified.

Following consultation with IACs, SunWater has decided to implement a new procedure for options assessments.

SunWater will continue to prepare an options analysis and supporting investigation where:

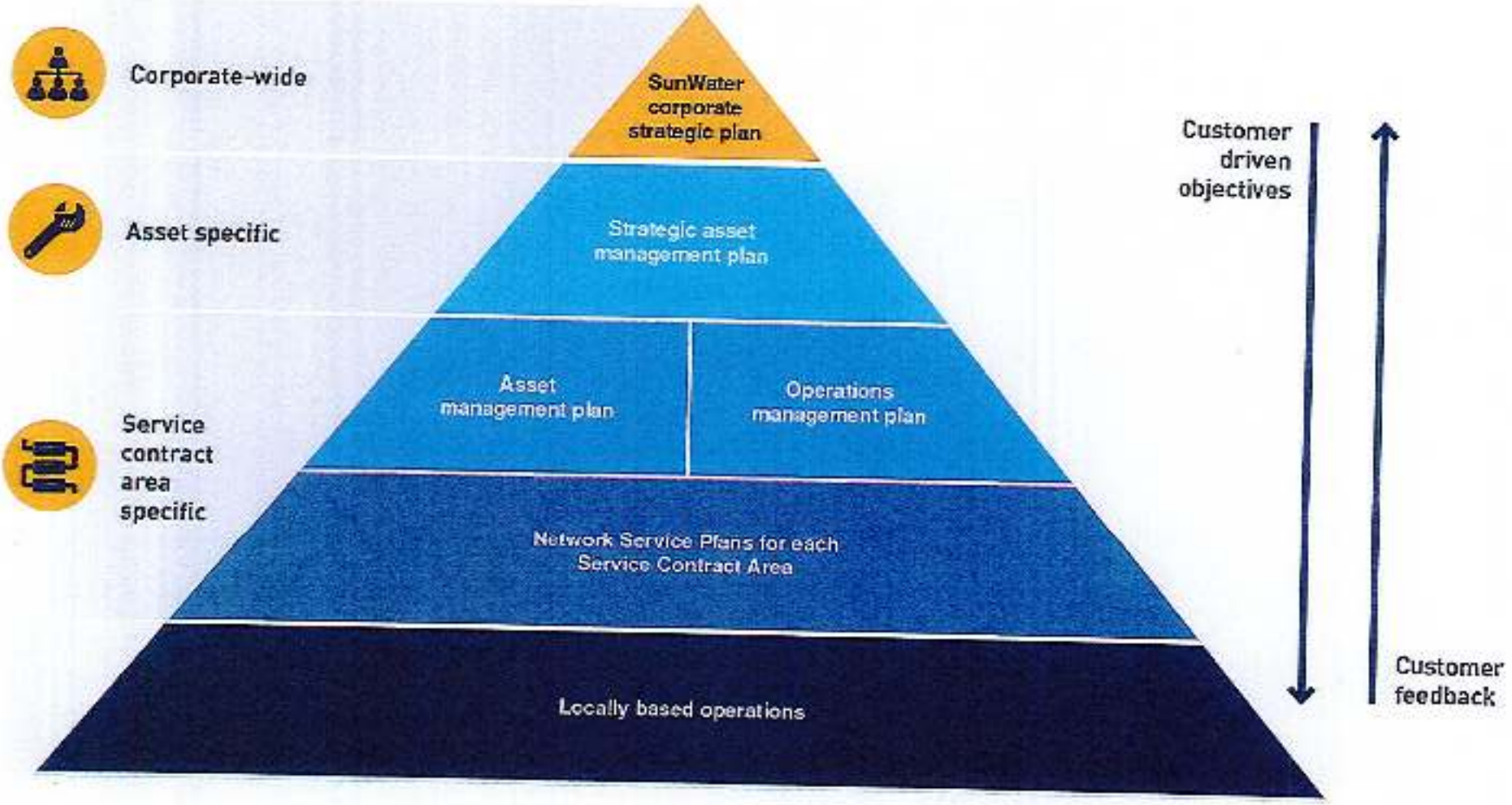
- there is no obvious solution
- the current maintenance strategy is changing
- technology has changed significantly, or
- there is a high risk in the project execution.

For less complex (more routine) renewals projects with fewer practical outcomes, SunWater will use its engineering knowledge and experience to determine the optimum solution.

This approach takes the emphasis off the value of the renewals project and focuses on solutions and risk. It ensures that SunWater invests resources appropriately in those projects that would benefit from an options analysis.

Appendix 1: SunWater's asset management framework

Figure 5: SunWater's asset management framework



Appendix 2: Total expenditure by expense type

Table 8: Expenditure for activity by type[1]

St George Service Contract	2014/15 SunWater Actual $'000	2014/15 QCA Recommended $'000	2014/15 Variance $'000	2015/16 SunWater Actual $'000	2015/16 QCA Recommended $'000	2015/16 Variance $'000	2016/17 SunWater Actual $'000	2016/17 QCA Recommended $'000	2016/17 Variance $'000	2017/18 SunWater Estimate $'000	2017/18 2016/17 QCA Recommended (Adjusted) $'000	2018/19 SunWater Forecast $'000	2018/19 2016/17 QCA Recommended (Adjusted) $'000	2019/20 SunWater Forecast $'000	2020/21 SunWater Forecast $'000	2021/22 SunWater Forecast $'000	2022/23 SunWater Forecast $'000	2023/24 SunWater Forecast $'000
Routine spend																		
Operations																		
Labour	83.2	164.0	80.8	121.4	165.2	47.9	85.5	174.6	89.1	167.3	179.0	130.1	180.5	131.2	135.0	135.9	142.6	147.1
Contractors	23.5	17.5	(6.0)	7.9	18.0	10.1	10.2	18.3	8.2	20.0	18.8	15.0	19.5	15.0	15.4	15.8	16.2	16.5
Materials	5.3	68.8	63.5	4.6	71.0	66.4	1.0	72.2	70.5	6.0	74.0	20.0	75.9	20.0	20.5	21.0	21.5	21.9
Electricity	7.4	9.6	2.2	3.5	10.4	6.9	7.5	11.1	3.5	6.5	11.4	6.0	11.6	6.0	5.9	6.1	6.3	6.2
Insurance	134.9	42.4	(92.5)	117.5	43.1	(74.7)	114.4	43.8	(70.6)	116.4	44.9	137.0	46.0	140.1	143.4	146.7	150.1	153.5
Other	8.7	30.3	21.6	6.7	31.0	24.3	15.7	31.5	16.2	21.0	32.3	20.6	33.1	20.3	20.5	21.0	21.5	21.9
Local area support costs	53.5	-	(53.5)	104.4	-	(104.4)	74.3	-	(74.3)	115.0		145.1		165.6	170.2	174.7	179.2	183.5
Corporate support costs	47.2	180.5	133.3	40.8	165.8	125.0	31.2	169.4	138.2	26.6	173.7	84.6	178.0	85.0	87.2	89.5	91.8	94.2
Indirect costs	79.3	180.0	100.7	142.7	178.1	35.5	94.4	171.2	76.8	132.8	175.5	145.8	179.9	247.0	253.4	250.0	256.7	273.2
Preventative maintenance																		
Labour	97.3	73.2	(24.1)	92.2	75.5	(16.7)	88.9	77.9	(11.0)	33.1	79.4	70.0	81.5	70.6	72.6	74.7	75.9	78.1
Contractors	23.8	2.7	(21.0)	28.4	2.8	(25.6)	25.8	2.9	(22.9)	30.0	2.9	30.0	3.0	30.1	30.6	31.6	32.3	33.1
Materials	2.4	6.0	3.5	5.5	6.2	0.6	2.8	6.3	3.5	10.0	6.4	10.0	6.6	10.0	10.3	10.5	10.7	11.0
Other	19.5	3.4	(16.1)	16.4	3.5	(12.9)	8.4	3.6	(4.8)	16.0	3.6	16.0	3.7	16.0	16.4	16.8	17.2	17.6
Local area support costs	71.5	-	(71.5)	79.3	-	(79.3)	76.5	-	(76.5)	25.8	-	74.2	-	75.6	77.5	79.5	81.6	83.7
Corporate support costs	36.2	72.0	35.8	29.3	70.7	41.4	26.7	72.5	45.5	15.8	74.1	45.5	75.8	45.7	46.9	48.1	49.4	50.7
Indirect costs	74.5	77.8	3.3	89.4	73.9	(15.5)	52.8	71.1	18.2	10.3	73.0	41.4	74.7	41.6	42.7	43.8	44.9	46.1
Corrective maintenance																		
Labour	2.1	46.2	47.6	2.0	45.2	43.2	2.9	47.2	44.3	27.6	48.9	28.4	50.1	28.6	29.4	30.1	31.1	32.0
Contractors	6.3	3.3	(3.0)	6.5	3.3	(2.4)	7.3	3.4	(3.9)	15.0	3.4	10.0	3.0	10.0	10.3	10.5	10.8	11.0
Materials	3.1	2.7	(0.4)	0.7	2.8	2.1	5.0	2.9	(2.1)	5.1	2.9	5.0	3.0	5.0	5.1	5.2	5.4	5.5
Other	1.6	3.2	1.5	5.1	3.2	(1.9)	1.1	3.3	2.2	6.0	3.4	6.0	3.4	6.0	6.1	6.3	6.4	6.6
Local area support costs	1.6		(1.6)	3.5	-	(3.5)	2.5	-	(2.5)	21.5	-	36.3	-	36.5	37.4	38.4	39.4	40.4
Corporate support costs	1.3	43.2	42.0	1.4	43.4	42.0	1.5	44.3	42.8	15.0	45.4	18.4	46.5	18.5	19.0	19.5	20.0	20.5
Indirect costs	1.8	47.6	45.8	2.2	45.1	42.9	1.7	43.5	41.8	8.1	44.6	16.8	45.7	16.8	17.3	17.7	18.2	18.7
Routine total	757.8	1269.1	[illegible]	[illegible]	1262.8	158.6	799.3	1270.7	331.2	927.4	1297.5	1232.6	1324.9	1241.4	1273.4	1306.5	1340.4	1374.9
Non-routine spend																		
Labour	102.1	121.2	[illegible]	146.7	73.2	(73.5)	232.8	67.5	(165.3)	78.0	83.3	241.0	10.0	4.0	13.1	28.2	35.4	23.3
Contractors	174.7	107.2	(67.4)	272.1	78.4	(193.7)	590.1	141.2	(449.0)	300.7	108.5	798.5	20.1	498.9	130.2	268.0	315.4	61.0
Materials	0.5	97.9	97.4	21.6	78.4	56.7	16.0	142.9	127.0	43.6	95.7	53.4	11.5	7.8	17.2	8.2	27.6	35.9
Other	22.9	53.4	30.5	21.7	41.4	19.8	40.1	30.8	(9.3)	6.6	35.0	36.8	4.2	-	-	8.5	8.5	11.7
Local area support costs	44.1		(44.1)	57.1	-	(57.1)	97.5	-	(97.5)	51.0	-	156.7	-	3.4	11.2	20.0	47.1	19.8
Corporate support costs	78.4	119.5	41.2	126.1	90.4	(35.7)	230.7	90.1	(140.6)	60.8	112.0	145.8	21.5	4.8	15.6	20.5	52.9	25.5
Indirect costs	75.3	112.5	37.4	138.9	82.1	(57.8)	138.4	70.8	(65.4)	74.4	101.0	147.5	12.2	1.7	6.1	12.2	24.1	10.5
Non-routine total	[illegible]	581.8	84.0	[illegible]	443.5	(325.8)	[illegible]	542.4	(772.7)	574.0	553.5	1592.3	71.5	520.6	186.4	459.1	529.7	190.7
Total spend	1280.6	1851.1	570.4	1674.2	1706.3	(167.8)	2114.6	1813.1	(441.5)	1501.5	1850.0	2825.0	1396.4	1762.0	1459.8	1776.6	1870.1	1565.2

1 Totals may not add due to rounding.

Direct costs

Direct costs are those costs which are able to be directly attributable to either an asset or a service contract eg maintenance or insurance of an asset or the electricity and other operations costs for a service contract.

Local area support costs

Local area support costs are spread across service contracts managed in each locality. They are costs which support local people doing their jobs eg regional accommodation costs, local administration support and training.

In 2018/19 the St George Bulk Water Service Contract is allocated 0.829 per cent of the forecast total local area support costs. Forecast local overheads in 2018/19 are higher than previous years and now more closely reflect actual local overheads in each region rather than local overheads averaged across SunWater.

Indirect costs

Indirect cost pools capture costs such as billing and customer support, irrigation pricing regulation and asset management (including dam safety, asset systems, channels and drainage) that have not been directly charged. They also include flood room operations, the Inspector-General Emergency Management (IGEM) emergency management program, water planning, hydrographic services, and environmental support costs. Indirect costs are based on a user pays approach eg service contracts without a dam or weir are not apportioned dam safety costs.

In 2018/19 the St George Bulk Water Service Contract is allocated 7.155 per cent of the forecast total indirect costs. Increases in indirect costs allocated to Operations are largely driven by new IGEM costs, which are $141,000 in 2018/19 for this Service Contract.

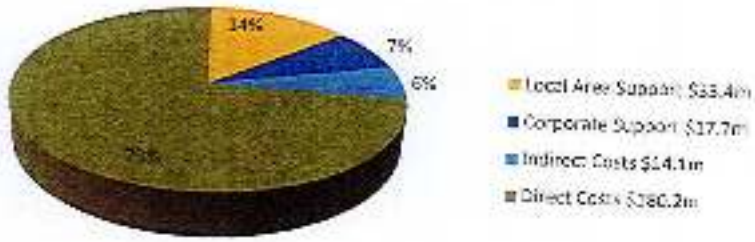
Corporate support costs

Corporate support costs are more generic than indirect costs and local area support costs, and are spread across all service contacts based on direct labour. They include the cost of human resources and payroll, information and communications technology, corporate communications, legal, property, finance, and internal audit, plus the costs of the Chief Executive Officer, Chief Financial Officer and the SunWater Board, where these costs are not directly charged to activities within service contracts.

In 2017/18 SunWater completed a corporate restructure which resulted in a net reduction of 20 positions from the business and a reduction in total corporate overhead costs. Despite this, corporate overheads allocated to each service contract have increased since 2017/18. Contributing factors to the increase are: the transfer of St George and potential transfer of Dawson distribution schemes to locally managed entities and less charging of labour to direct costs.

In 2018/19 the St George Bulk Water Service Contract is allocated 0.840 per cent of the forecast total corporate support costs.

Figure 6: Total SunWater cost pools – 2018/19 forecast



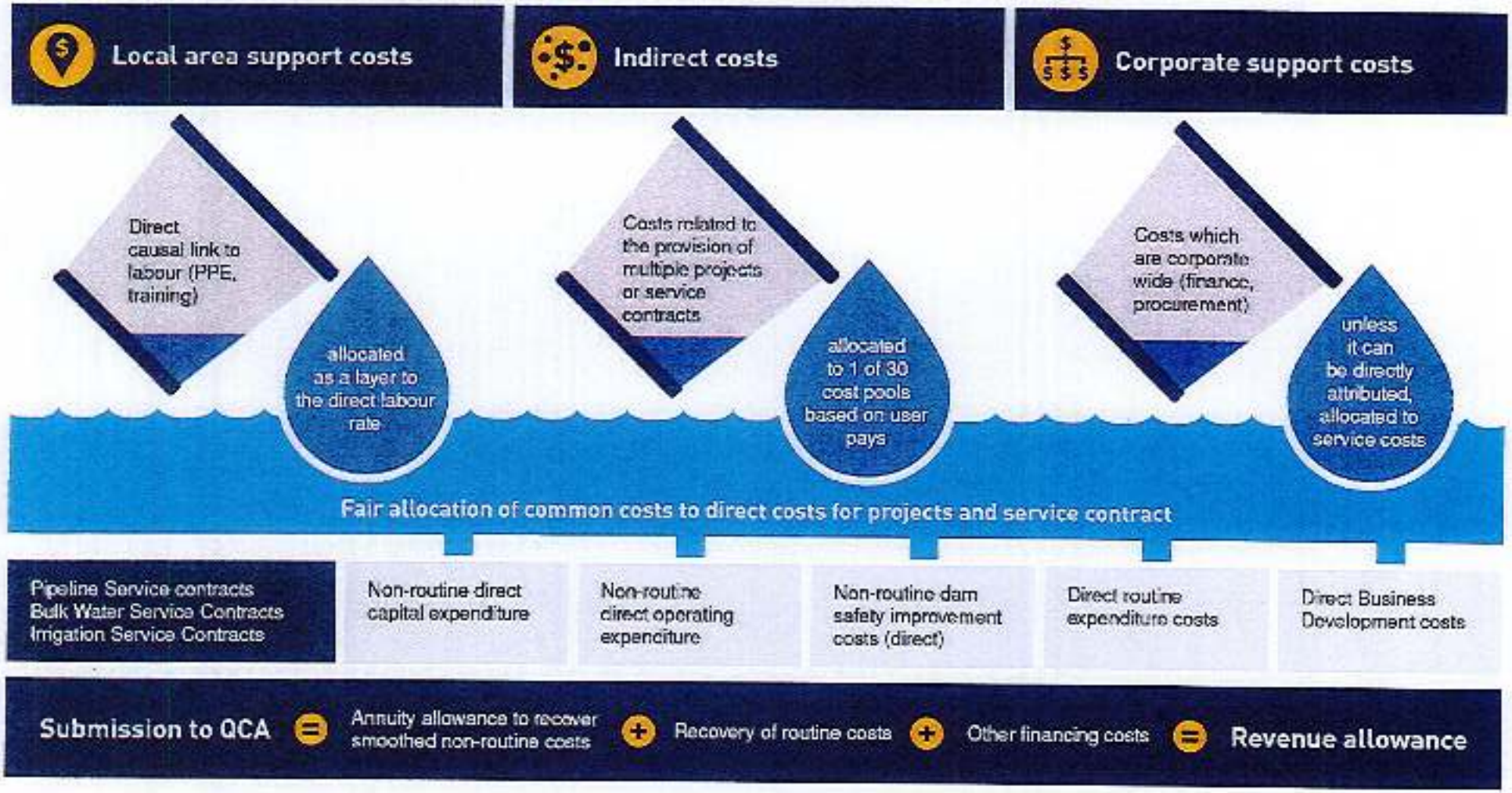
In the 2012 irrigation pricing review, the QCA reviewed and accepted SunWater's methodology for recovering local area support costs, indirect costs and corporate support costs. In 2018 we reviewed the cost allocation methodology and made changes to increase the transparency of local overhead costs and the allocation of corporate support costs to direct expenses. We also:

- removed the cascading of corporate overheads into indirect costs
- made the local overhead rate specific to each region
- simplified the cost drivers to labour only, removing the 5 per cent on direct cash costs excluding labour and electricity.

Forecast figures contained in this NSP reflect this change in approach.

Figure 7 below illustrates the allocation of costs associated with providing services.

Figure 7: How are SunWater's costs allocated to each service contract?



Appendix 3: Routine expenditure

Operations

Operations expenditure includes day-to-day costs associated with management of the Service Contract, water delivery and meeting compliance obligations. Specific activities include the direct and non direct costs of:

- scheduling and delivering water, including processing water orders, releasing water, regulating and monitoring channel flows, and monitoring customer deliveries
- emergency responses for emergency events
- meter reading
- administration of water accounts, billing and receipting payments
- customer management, including enquiries, complaints and maintaining the customer service help desk
- Service Contract management, including licences and permits, rates, land management, planning and reporting
- insurance
- monitoring the security of infrastructure and unauthorised access
- managing engagement associated with the Service Contract
- managing enquiries from adjoining landholders and developers that require input from and negotiations with SunWater's property and legal sections
- dam inspections and other surveillance activities.

Preventative maintenance

Preventative maintenance for the St George Bulk Water Service Contract includes:

- Condition monitoring — the inspection, testing or measurement of physical assets to report and record condition and performance to determine maintenance requirements. Condition monitoring is carried out on electrical, mechanical and civil assets.
- Servicing — planned maintenance activities carried out routinely on physical assets including valves, gauging stations, cranes, sump pumps and associated equipment.
- Weed control — management of weeds, including spraying and other activities to control nuisance and noxious weeds.

Scheduled corrective maintenance

Scheduled corrective maintenance varies by asset type and typically includes:

- Storages:
  - repairing control gates, valves and concrete structures
  - repairing walls, embankments and spillways.
- Service Contract roads:
  - repairing pot holes and grading roads
  - repairing, replacing, and painting guide posts and signs.
- Meters:
  - repairing bulk water meters and customer meters.

Emergency corrective maintenance

Emergency corrective maintenance typically includes responding to theft or vandalism associated with Service Contract assets.

Appendix 4: Non-routine projects for 2018/19 to 2023/24

Non-routine projects are asset-related projects required to support service delivery which are undertaken less frequently than annually.

Table 9: Non-routine projects (or planning items) 2018/19 to 2023/24

Year	Project Title	Project Scope	Budget ($'000)
2018/19	Beardmore Dam – Thuraggi Channel repair	Sand boils in the channel immediately downstream of the Thuraggi outlet need to be addressed by increasing the length of the outlet channel and twin conduits about 40 metres downstream along with channel slope protection.	1329
	Beardmore Dam – Upgrade recreational facilities	Fencing and viewing platform upgrades at Beardmore Dam's recreational facilities.	57
	Beardmore Dam – Crane audit	This project is to derive an individual inspection and maintenance schedule for the winches at Beardmore Dam. Historically, SunWater has applied the relevant Australian Standards; however, there is scope to move away from the inspection frequencies under some circumstances.	33
	Jack Taylor Weir – Crane audit	This project is to derive an individual inspection and maintenance schedule for the winches at Beardmore Dam. Historically, SunWater has applied the relevant Australian Standards; however, there is scope to move away from the inspection frequencies under some circumstances.	33
	Jack Taylor Weir – Install closed-circuit television (CCTV) cameras	A near triple fatality at the weir during 2017 highlighted the need to monitor illegal access to the weir so CCTV cameras will be installed.	18
	Jack Taylor Weir – Decommissioned outlet plugging	The two low-level outlet gates at the weir are in poor condition. It is not known if they have been plugged with concrete to prevent a run-away storage if they fail. This project is to fill them with concrete.	31
	Other works	There are 6 other non-routine projects for 2018/19.	80
	2018/19 Total		**1581**
2019/20	Beardmore Dam – Thuraggi Channel repair (Contingency)	This is a contingency for the Thuraggi Channel repairs.	308
	Beardmore Dam – Design and install Thuraggi Channel meters	Releases into Thuraggi Channel need to be metered for accurately recording volumes released into the irrigation schemes. This will allow better water management at the dam.	173

Year	Project Title	Project Scope	Budget ($'000)
	Meter replacements	This is an allowance to replace failed customer meters. If no meters fail, the funds will remain in the annuity.	13
	Other works	There are 2 other non-routine projects for 2019/20.	27
	2019/20 Total		**521**
2020/21	Beardmore Dam winches and crane structure – 10 year inspection	The 10 year inspection will only occur if the 2019 crane audit determines its need. The current standard requires it; however, the timing can be moved if a suitably qualified crane engineer assesses each crane.	62
	Jack Taylor Weir winches – 10 year inspection	The 10 year inspection will only occur if the 2019 crane audit determines its need. The current standard requires it; however, the timing can be moved if a suitably qualified crane engineer assesses each crane.	21
	Meter replacements	This is an allowance to replace failed customer meters. If no meters fail, the funds will remain in the annuity.	14
	Jack Taylor and Beardmore – X-ray examination of the wire ropes x7	X-ray examination of seven of the wire ropes is an effective way of determining their condition so their replacement can be scheduled.	90
	Other works	There are no other non-routine projects for 2020/21.	-
	2020/21 Total		**187**
2021/22	Beardmore Dam – 20 year dam safety review	The Queensland Dam Safety Management Guidelines and condition schedule require each referable dam to undergo a dam safety review every 20 years to identify any deficiencies in design when compared to current standards and practices.	363
	Beardmore Dam – Thuraggi Channel bulkhead gate refurbishment	The seals and concrete sill will be refurbished prior to the next five-yearly inspection.	18
	Beardmore Dam – Foundation drain clean	The foundation drains in most dams with a gallery are checked every five years for calcite blockages. If blocked, they need to be cleaned out to relieve the uplift pressure beneath the concrete structure to retain its stability. Only the blocked drains will be cleaned.	35
	Meter replacements	This is an allowance to replace failed customer meters. If no meters fail, the funds will remain in the annuity.	14

Year	Project Title	Project Scope	Budget ($'000)
	Jack Taylor Weir – Comprehensive inspection	SunWater conducts comprehensive inspections on each weir every five years to identify defects and plan for their repair. Keeping the condition and risk data current allows us to defer projects if they can be deferred and bring forward higher risk projects if required.	40
	Other works	There are no other non-routine projects for 2021/22.	-
	2021/22 Total		470
2022/23	Beardmore Dam – Comprehensive risk assessment (CRA)	This follows on from the dam safety review. The CRA fully assesses all new risks identified during the safety review, derives an initial list of recommendations to overcome the risks and starts to prioritise the work.	224
	Beardmore Dam – Comprehensive inspection	SunWater conducts comprehensive inspections on each dam every five years to identify defects and plan for their repair. Keeping the condition and risk data current allows us to defer projects if they can be deferred and bring forward higher risk projects if required. This is also a requirement of the dam safety condition schedule for each dam.	113
	Meter replacements	This is an allowance to replace failed customer meters. If no meters fail, the funds will remain in the annuity.	14
	Beardmore Dam – Refurbish winches	This will only occur if needed. Regular inspections leading up this project will inform SunWater if it can be deferred or not. The winches are critical assets so it is prudent to plan for the refurbishment.	98
	Jack Taylor Weir – Refurbish winches	This will only occur if needed. Regular inspections leading up this project will inform SunWater if it can be deferred or not. The winches are critical assets so it is prudent to plan for the refurbishment.	81
	Other works	There are no other non-routine projects for 2022/23.	-
	2022/23 Total		530
	Jack Taylor Weir – Refurbish remaining winches x6	This will only occur if needed. Regular inspections leading up this project will inform SunWater if it can be deferred or not. The winches are critical assets so it is prudent to plan for the refurbishment.	108
	Meter replacements	This is an allowance to replace failed customer meters. If no meters fail, the funds will remain in the annuity.	15

Year	Project Title	Project Scope	Budget ($'000)
	Beardmore Dam – Left and right abutments refurbishment	These two projects are to periodically replace scoured or lost material from the embankments. If the fence option in 2020 proceeds, these will not be needed.	28
	Beardmore Dam – Internal road resurfacing	The internal sealed roads to the houses and left abutment need periodic treatment to keep them trafficable. If a condition assessment closer to this year determines they remain in good condition, this project will not be needed.	22
	Other works	There are 2 other non-routine projects for 2023/24.	17
	2023/24 Total		190

Appendix 5: Material renewals projects

Table 10: Material renewals projects by year

Year	Project Title	Budget ($'000)
2019	Beardmore Dam – Thuraggi Channel repair	1329
2020	Beardmore Dam – Thuraggi Channel repair	308
2022	Beardmore Dam – 20 year dam safety review	363

SunWater

Contact us

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We consider and respond to all submissions, publishing all responses on our website.

Dam Safety Inspections, 20yr Dam Safety Reviews and Comprehensive Risk Assessments

Annual dam safety inspections, comprehensive (5yr inspections) dam safety inspections and 20yr dam safety reviews are part of the QLD dam safety management guidelines and therefore part of the dam safety condition schedule for Beardmore Dam and as such, SunWater has a legal obligation to undertake these activities. Comprehensive risk assessments are industry standard practice to evaluate the deficiencies found in the safety review.

Annual Inspections

Annual inspections Purpose

Generally carried out by a dams engineer with the purpose of identifying physical deficiencies of the dam by visual examination and review of surveillance data against prevailing knowledge.

Reporting

The report documents the status of the dam and all defects or unsafe conditions and outlines a strategy for taking remedial action (including preliminary costing and, if several defects or conditions are found, prioritisation of actions).

Undertaken by: An experienced dams engineer who is a Registered Professional Engineer (RPEQ).

Discussion

The inspection should assess all physical aspects of the dam. A periodic inspection requires preparation of checklists, preparation of mechanical equipment, and preparation of access (confined and difficult areas). SunWater undertakes less extensive periodic inspections annually. These inspections provide valuable condition assessment information for the development of routine and non-routine maintenance work.

Comprehensive (5yr) Inspections

Comprehensive inspections Purpose

A periodic inspection of the dam and a review of the owner's whole dam safety management program. These inspections may include:

- a test operation of all equipment
- evaluation of all surveillance data
- major function checks and maintenance inspections.
- flip bucket dewatering
- conduit dewatering
- diver inspection of intake works
- conduit video inspection.

The timing of the inspection depends on the regional weather.

Reporting

The report assesses all aspects of the dam safety management program and fully documents:

• deficiencies identified in the dam safety management program and its documentation

• a strategy for overcoming the deficiencies (including prioritisation of actions if several deficiencies are identified).

Undertaken by: An experienced dams engineer who is a RPEQ.

Discussion

This inspection should incorporate:

• a periodic inspection

• an assessment of the appropriateness and adequacy, the effectiveness and application (including the owner's response to inspection report and Safety Review recommendations) of the dam safety management program and documentation for the dam including:

• SOPs

• O&M Manuals

• Emergency Action Plan

• Data Book

• Design Report/Safety Review

• Surveillance and inspection program and records.

(This assessment should take into account applicable development permit conditions for the dam and the requirements outlined in this guideline.)

20yr Dam Safety Reviews

Introduction

A safety review is a procedure for systematically assessing the safety of a dam after its original construction. It is a fresh engineering assessment of the integrity of all elements of a dam. It usually incorporates a:

• current failure impact assessment

• detailed review of structural, hydraulic, hydrologic and geotechnical design aspects

• review of historical operational performance

• review of surveillance reports

• comprehensive inspection of the dam

• comparison of the standards used for building and upgrading the dam against current design standards.

The steps involved in a safety review include:

• Collect background information on the dam. This includes all relevant historical investigation, design, construction, remedial, operation and maintenance, monitoring and inspection data.

• Compare the performance of the dam with the standard set by the original design engineers (if known) and the relevant standards and guidelines existing at the time of the review. The review must include a prediction or assessment of the theoretical performance of the dam against current standards and guidelines.

• Where design aspects are based on assumptions or are incomplete, the Safety Review should include basic investigations and detailed analysis to substantiate the design.

• In the case of incomplete documentation, further investigations may be required, particularly in the case of an initial safety review. Where insufficient plans or data exist of critical elements, additional investigation activities should be undertaken to resolve uncertainties. Typical investigation activities include:

– survey to establish lines and dimensions

– testing of materials in the dam and its foundation

– geological drilling and mapping

– calculation of revised flood estimates

– updating of earthquake forces.

Particular attention should be given to changes in land use that may have occurred since construction of the dam which may affect design and operation criteria. This includes such activities as mining, urbanisation or clearing of the catchment area both upstream and downstream of the dam.

The design assumptions and standards used should be reviewed and compared with current best practice, e.g.

• the foundation integrity (bearing, seepage) applied should be reviewed and compared with current best practice

• the spillway adequacy should be reviewed and compared with current accepted engineering standards, i.e. ANCOLD–Guidelines on Selection of Acceptable Flood Capacity for Dams

• the embankment and outlet structure should be reviewed and checked as to whether it can withstand appropriate loadings (including seismic) in accordance with current engineering practice.

Conclusions should be developed regarding the adequacy of the main elements of the dam (i.e. foundations, main wall, spillway, outlet works, associated equipment and monitoring system). Comments should be made regarding adequacy of the dam safety surveillance and inspection program and operation and maintenance procedures. Such comments and conclusions should reflect prevailing knowledge in hydrology, hydraulics, soil mechanics, geology, structural analysis and design criteria relating to dams.

The level of sophistication of Safety Reviews varies depending on the complexity of the dam. For example, a Safety Review for a large gated structure requires a greater range and depth of studies than for a small grassed bywash earth dam. In addition, Safety Reviews are not necessarily

completed when the Safety Review Report is finalised. Subsequent investigations recommended in the Report are often required and may take years to finalise.

Frequency of Safety Review

The frequency of dam safety reviews is generally based on the age of the dam and the appropriateness of the technology used on that dam. Safety reviews are generally conducted on a maximum twenty-year cycle but may also be initiated in response to issues such as:

- an absence of design and construction documentation
- a regulatory requirement
- detection of abnormal behaviour
- changes in acceptable design and construction standards
- proposals to raise or modify a dam
- changes in Standing Operating Procedures.

Safety Review personnel

The Safety Review of a dam can be quite complex and personnel engaged in safety reviews should be experienced in dam technology. Where necessary, the services of suitably experienced geologists, hydrologists and other specialists should be utilised. Consideration should also be given to independent review by engineers other than those who carried out the original design of the dam.

Safety Review Reports

A Safety Review Report should be produced to document the safety review and should include:

- a statement on the safety of the dam indicating whether or not the dam is in a satisfactory condition and capable of meeting current design criteria
- report on comprehensive inspection
- parameters adapted and assumptions made (and their bases) for review analyses
- methods of review analyses and results (numerical and physical)
- identification of any deficiencies in the dam including criticality ratings for these deficiencies and recommendations for remedial work, emergency action and/or further studies which should be undertaken and timings for these.

A deficiency may be insufficient knowledge about a particular aspect of a dam.

Whilst dam owners may engage consultant engineers to carry out the Safety Review and prepare the report, the recommendations contained in a Safety Review Report will be considered as originating from the dam owner. The dam owner will be responsible for implementing the recommendations. Comprehensive inspections and ultimately audits undertaken by the Regulator, will evaluate the dam owners response to Safety Review Reports.

Comprehensive Risk Assessments

SunWater has an obligation to ensure that dams under its ownership, that pose a potential threat to the community, have adequate spillway capacity to prevent overtopping failure and adequate protection to prevent structural failure of the embankment or spillway.

The methodology adopted for the Comprehensive Risk Assessment of a dam is summarised in the following:

- The societal and individual risks associated with floods and all other risks for the existing dam are quantified in accordance with the ANCOLD Guidelines on Risk Assessment using Grahams' Method for determination of Loss of Life (LOL).
- The Fallback Acceptable Flood Capacity (AFC) of the dam is determined as recommended in the Guidelines on Acceptable Flood Capacity of Dams (NRW, 2007).
- If the spillway capacity is found to be uncacceptable compared to the AFC, a dam safety upgrade to 100% Fallback AFC is to be investigated.
- The Cost to Save a Statistical Life (CSSL) and the cost benefit are also determined for each upgrade in order to test that the ALARP Principal is satisfied and a sensitivity analysis is also undertaken to see the impacts of halving and reducing the loss of life to zero and doubling the damages would have on the cost benefit.

Type, Level and Rigour of Risk Assessment

This Risk Assessment investigates the risk of failure of the dam caused by overtopping during flooding, Sunny Day piping failure, and piping failure during floods and seismic events.

This risk assessment adopts a "detailed" level of assessment using "advanced" levels of engineering inputs in accordance with the Guidelines on Risk Assessment (ANCOLD, 2003).

The risk assessment is undertaken by an in-house dam engineering design team consisting of engineers that were heavily involved with the dam safety reviews on the original 25 SunWater dams with additional support from more expert consultants. A peer review panel review the overall Risk Assessment process and the outcomes of the assessment. The report is reviewed also by the Regulator to obtain comment and ratification of the standard of the risk assessment adopted.

Legal and Regulatory requirements

Recently, the Regulator released the regulatory guidelines on Acceptable Flood Capacity for Dams in Queensland (NRW, 2007). The SunWater Board requires that the comprehensive risk assessments for all its dams are undertaken within a standard approach across the complete portfolio.

The Board has a legal obligation to ensure that the risk assessment is undertaken in line with current dam engineering standards and these are specifically, the ANCOLD and NRW Guidelines.

Risk Assessment

The Risk Assessment is undertaken in accordance with the ANCOLD Guidelines on Risk Assessment, (ANCOLD, 2003) and Assessment of the Consequences of dam failure (ANCOLD, 2000b) and the NRW Guidelines on Acceptable Flood Capacity for Dams (NRW, 2007) and the Natural Resource and Mines guideline Guidance on the Assessment of Tangible Flood Damages.(NRM, 2002).

Participants in the comprehensive risk assessment

The participants in the risk assessments are as follows:

- **The owner** i.e SunWater – Legally responsible for the dam and the decision maker on risk tolerability issues.
- **The decision maker** i.e SunWater – by taking the results of the risk analysis and the decision recommendations of the analysis team, and decides what action, if any, should be taken.
- **The risk analysis team** – Responsible for undertaking the risk analysis, and possesses the knowledge and skills appropriate to the purpose of the risk assessment.
- **The Regulator of dam safety** – Not a direct participant, but sets the minimum requirements in relation to those risks that affect the interests of the community.
- **Peer Review Team** – Responsible for reviewing the comprehensive risk assessment draft report. This is undertaken in a workshop environment and involves the risk analysis team from Sunwater including Infrastructure Development as the designers, Chief Engineer Design, Manager Asset Management and Principal Engineer Dam Safety and regional Asset Engineering Manager as representatives of the asset owner and the external expert peer reviewer.
- **External Expert Peer Reviewer** – participates in a workshop to objectively review the risk assessment process and outcomes.