

Review of the Tasmanian Water and Sewerage Corporation's
Operating Expenditure and Capital Expenditure (including asset values)

OFFICE OF THE TASMANIAN ECONOMIC REGULATOR

Final Report

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Appendix C. Summary of key recommendations and improvement opportunities

Glossary of Terms and Acronyms

Term	Definition
ADWG	Australian Drinking Water Guidelines
AM	Asset Management
AMP	Asset Management Plan
AOSC	Asset Owners Steering Committee
BLW	Ben Lomond Water
CAPEX	Capital Expenditure
CIRCA	Conduit Inspection Reporting Code of Australia (WSA 05)
CMW	Cradle Mountain Water
DHHS	Department of Health and Human Services (Tasmania)
DPIPWE	Department of Primary Industries, Parks, Water and Environment
DSMP	Dam Safety Management Plan
DWQMP	Drinking Water Quality Management Plan
EPA	Environment Protection Authority (Tasmania)
EPN	Environment Protection Notice
IIMM	International Infrastructure Management Manual
NPC	Net Present Cost
NPV	Net Present Value
OPEX	Operating Expenditure
OTTER	Office of the Tasmanian Economic Regulator
PSP	Pricing and Services Plan
RAB	Regulatory Asset Base
SAMP	Strategic Asset Management Plan
STP	Sewage Treatment Plant (identical to WWTP)
SW	Southern Water
The Regulator	Tasmanian Economic Regulator
TasWater	The Tasmanian Water and Sewerage Corporation
WHS	Workplace Health & Safety
WSAA	Water Services Association of Australia
WTP	Water Treatment Plant
WWMP	Wastewater Management Plan
WWTP	Wastewater Treatment Plant (identical to STP)

Real values are shown in FY2015 dollars (\$2015). Jacobs have adopted a CPI of 2.5 per cent, which was assumed by TasWater for the regulatory period. All dollar values are Real (\$2015) unless otherwise indicated.

Executive Summary

The Regulator engaged Jacobs to undertake a review of the adequacy, appropriateness and efficiency of the levels of operating and capital expenditure incurred by Ben Lomond Water, Cradle Mountain Water and Southern Water (the previous regulated entities) and TasWater's current, forecast and proposed levels of operating and capital expenditure, including an assessment of asset values.

This has included a review of historical (2012/13) operating and capital expenditure for predecessor entities – Ben Lomond Water, Cradle Mountain Water, Southern Water - and of the TasWater's current (actual and budgeted for 2013/14, 2014/15) and planned (for the 2015/16 – 2017/18 regulatory period) operating and capital expenditure. This expenditure has been assessed for prudence (need) and efficiency. The general approach to the review is outlined in Section 1.3.

Asset Management

A broad strategic level review of TasWater's asset management and capital planning practices, which is integral to the expenditure assessment and to an assessment of asset values, has been undertaken. The outcomes of this review and specific recommendations and identification of improvement opportunities are indicated in Section 2.

Jacobs endorses the current Asset Management activities of TasWater and the current top-down development of its AM System (while also progressing various tactical and operational activities in a pragmatic manner considering current constraints).

A key recommendation is that TasWater should investigate a risk-based approach to the development of its Asset Management Plans – their timing and level of detail, with prioritisation of them such that as appropriate some lower risk/priority system AMPs are only developed at a high level initially, while other higher risk/priority systems are developed at a detailed level as soon as practicable. Further there should be a strong nexus between the AMPs developed and TasWater's other regulated plans (the WWMP, DWQMP, DSMP and EMP).

Jacobs has found that TasWater's capital planning and prioritisation process is appropriate for its PSP2 submission. It allows TasWater to capture and prioritise its existing commitments; its key water, wastewater and dam safety risks; and its other identified CAPEX projects in a systematic and easy-to-apply process that balances 'risks of deferring the project' and corporate strategic objectives. Its role within the Project Management Framework (capital delivery gating process) is clear and responsibilities have been assigned.

Jacobs has seen that TasWater has applied the process in an iterative fashion with consideration of financial, resource or other constraints and as the regulatory plans (WWMP, DWQMP and DSMP) have been developed.

However, the process will need to be refined for future regulatory submissions when existing commitments have been delivered and TasWater will need to balance compliance expenditure with greater levels of renewals, growth and performance improvement expenditure that will be better understood through the sequencing plans and asset management plans that TasWater will be developing through PSP2.

Capital Expenditure

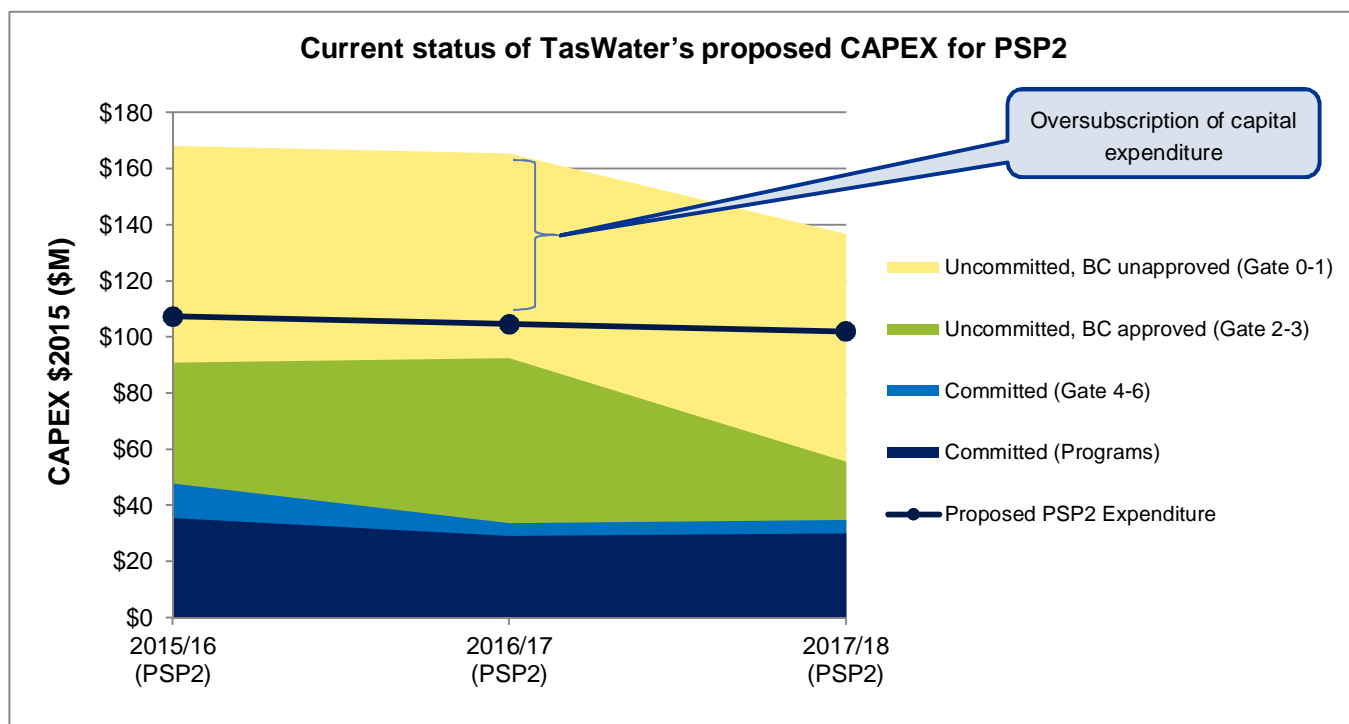
Jacobs finds that there is a poorly defined relationship between the list of capital projects included for PSP2 within TasWater's Capital Works Program spreadsheet and the proposed capital expenditure levels presented by TasWater in its draft PSP2 submission. This has been discussed with and acknowledged by TasWater – who indicate that the proposed \$330M_{nominal} expenditure was determined through an assessment of TasWater's delivery capacity and its financial constraints. The process by which TasWater establishes its prioritised approach is outlined in Section 3.2.2.

An oversubscription of projects (currently \$494M_{nominal}) in its Capital Works Program is being employed by TasWater as a significant number of its capital projects with proposed expenditure in PSP2 do not yet have approved business cases. As of 27 November 2014:

- **45.9%** (\$77.3M) of the \$168.3M expenditure proposed in the capital works program for the first year of PSP2 (FY15/16) does not yet have an approved business case. This includes 147 out of 192 projects.
- But given the oversubscription of projects, **84.8%** (\$91M) of the target \$107.3M expenditure for the first year of PSP2 (FY15/16) is approved. This includes 45 projects (\$55.4M) and 24 programs (\$35.6M).

- But of the \$91.0M approved for FY15/16, only \$47.9M is considered by Jacobs to be committed expenditure – composed of 19 projects (representing \$12.3M) that have contracts awarded and the \$35.6M of program expenditure. TasWater currently have 29 projects (worth \$43.1M in FY15/16 and \$122.6M over PSP2) that have business cases approved but have not yet had contracts awarded.

The current gate status of TasWater’s capital expenditure profile for PSP2 is summarised in the following figure, which has been overlayed with TasWater’s annual target expenditure proposed in its draft PSP2 submission.



TasWater’s expectation is that the \$494M_{nominal} will converge to \$330M_{nominal} through PSP2. Some projects currently being scoped may be found to be less urgent and thus deferred, or scoping activities may find more cost effective solutions. And should TasWater be approaching its \$110M_{nominal} target/limit per year, it will ‘throttle back’ its delivery program by deferring lower priority projects or may possibly seek alternative sources of funding.

Jacobs acknowledges TasWater’s challenge of needing to submit a robust (prudent and efficient) capital expenditure program for PSP2 at this stage of its maturity, but the Regulator has not been presented with an expenditure program that is able to demonstrate prudence and efficiency at a program level – due to ambiguity around the projects that will be delivered in PSP2 and the risk associated with cost estimates for projects that are still in strategic planning and scoping phases. This is particularly relevant given TasWater does not incorporate risk-based costing into its capital planning and prioritisation processes

TasWater’s current draft PSP2 submission can create uncertainty for TasWater’s stakeholders, including the Regulator and other industry regulators, who are not able to clearly identify the quantum of outcomes they can expect over the PSP2 regulatory period. In

Through this review, Jacobs is confident that TasWater will continue to seek greater certainty in its capital works program over the months and years ahead – and has noted TasWater’s commitment for regular (quarterly) communication with the regulators to ensure that there is appropriate awareness of, and input to, the evolving capital program.

Sample review of capital projects

A range of sample projects (historical, contemporary and proposed for PSP2) were reviewed and assessed for prudence and efficiency. The outcomes of this are summarised in a traffic light system approach (green = prudent, efficient; red = prudence, efficiency not sufficiently demonstrated) as indicated on the table below. Some general points to note are:

- Most projects are considered prudent noting particularly the substantial compliance challenges facing TasWater and consistency with what a ‘best practice’ water industry business should be doing
- Typically programs of works are considered prudent (i.e. there is a clear need for them) but some projects within them have not yet been adequately demonstrated to be prudent (in part because of the lack of robust supporting information or sufficiently robust strategies themselves)
- Many projects have been assessed as not efficient. This largely because either insufficient information exists or has been provided to Jacobs

Summary of the prudence and efficiency findings of the sample projects/programs

No.	Utility	Service	Project/Program Description	Prudent	Efficient
Proposed Projects - FY15/16 to FY17/18					
1	TasWater	Water	Tolosa Dam decommissioning	●	●
2	TasWater	Water	Fingal WTP construction	●	●
3	TasWater	Water	Flinders Island (Whitemark & Lady Barron WTPs)	●	●
4	TasWater	Water	Ringarooma, Ledgerwood, Derby, Branxholm TW	●	●
5	TasWater	Wastewater	Sewer Mains Renewals and CCTV programs	●	●
6	TasWater	Wastewater	Brighton STP rationalisation	●	●
7	TasWater	Wastewater	Kingborough sewerage strategy	●	●
8	TasWater	Wastewater	Ti Tree Bend WWTP upgrade	●	●
9	TasWater	Water	Small Towns Water Supply Strategy	●●	●
10	TasWater	Water	King Island Water Infrastructure Upgrade Program	●	●
Budgeted Projects - FY14/15					
11	TasWater	Wastewater	STP Inlet Works Program (Southern Region)	●●	●
12	TasWater	Water	Ouse & Hamilton Water Supply Upgrade	●	●
13	TasWater	Wastewater	Burnie Lion Trade Waste upgrades	●	●
14	TasWater	Wastewater	Bridport STP upgrade and re-use scheme	●	●
Historical Projects - FY12/13 and FY13/14					
15	BLW	Water	Ben Lomond Water's meter installation project	●	●
16	BLW	Water	Westbury WTP, reservoir and pipeline construction	●	●
17	CMW	Wastewater	Wynyard WWTP upgrades and renewals	●	●
18	CMW	Wastewater	Rosebery WWTP and pipeline construction	●	●
19	SW	Wastewater	Taroona Pump Station & Pressure Main	●	●
20	SW	Wastewater	Berriedale to Elwick Pipeline Duplication	●	●

Given the challenges in receiving detailed and timely information from TasWater and the uncertainties and/or variability around delivery performance and the actual program numbers being proposed, Jacobs has recommend adjustments at an overall program level for PSP2, which are shown in the following table.

Recommended adjustment to TasWater's PSP2 Capital Expenditure (\$M, 2015\$)

	2015/16	2016/17	2017/18	Total PSP2
TasWater proposed expenditure for PSP2	\$107.25	\$104.57	\$101.96	\$313.78
Jacobs recommended adjustment	-\$10.73	\$0.00	\$10.73	\$0.00
	-10%	0%	+10.5%	0%
Jacobs recommended expenditure for PSP2	\$96.53	\$104.57	\$112.69	\$313.78

The recommended reduction for FY2015/16 reflects the current low level of committed expenditure; the delays experienced with approvals on some sample projects reviewed; and TasWater's under-delivery over the past 2 years. The recommended increase for FY2017/18 recognises that there is a genuine and demonstrated need for the expenditure and acknowledges TasWater's efforts increase its delivery capacity and to develop and approve business cases for it high priority capital projects.

Asset Values

Jacobs considers that TasWater's asset values included in its Draft PSP2 submission reflect correct values using TasWater's current expenditure classification approach. However, this approach is not documented; and TasWater currently has a low level of granularity in the required data sets and assumptions, such that a quantitative assessment of the accuracy of these classifications is not possible at the time of this regulatory review.

TasWater does have a strong commitment to improve its systems and processes, and it is hoped that this review will provide some useful guidance on areas where TasWater can focus its improvement efforts ahead of its regulatory submission in three years for PSP3

Operating Expenditure

Jacobs recommends that in relation to TasWater's operating expenditure:

- The prudent and efficient operating expenditure in the Regulator's 2012 determination for 2013/14 should be used as the base from which forecast expenditure in 2015/16 – 2017/18 is determined. This is \$154.9M, which is \$1.8M lower than TasWater reported in its Draft PSP2, Attachment K.
- There should be no real increases in TasWater's operating expenditure for the period 2015/16 – 2017/18, i.e. the operating expenditure for 2013/14 in the Regulator's 2012 determination should be maintained in real terms.
- Given the information available, it is appropriate to increase operating expenditure by \$0.7M in 2015/16, \$1.0M in 2016/17 and \$1.4M in 2017/18 to reflect the impacts of the proposed capital program.
- Recognising the full year recurring savings (realised and forecast realisable) from the merger creating TasWater, the annual operating expenditure for the period 2015/16 – 2017/18 should be reduced by \$5.86M.
- Annual regulatory operating expenditures should be \$149.8M in 2015/16, \$150.1M in 2016/17 and \$150.5M in 2017/18.
- There are various mechanisms available to the Regulator to further incentivise TasWater to achieve greater efficiencies during the period 2015/16 – 2017/18.

Other specific matters for further consideration and/or assessment given the limited amount of detailed information on operating expenditure for review:

- TasWater appears to have incorporated non-cash items in its proposed regulated operating expenditure for PSP2 (e.g. provisions for losses and entitlements) which should be excluded;
- Broad contingency amounts (e.g. for materials) need further rigorous testing and justification;
- Comparison of TasWater with available national performance indicators suggests that there is at least a 5 – 10% scope for an efficiency reduction in costs that could be reflected in future in the opex base;
- TasWater's corporate costs also appear to be at the high end of the normal range of 9 – 13% for an efficiently run or 'best practice' Australian water business.

Key Operating expenditure areas for future focus for TasWater are:

- Improved information, ability and capability to explain the key drivers and reasons for changes in operating expenditure business segments (e.g. water and sewerage) and activity areas and to substantiate that narrative with documented evidence.
- Development of strong linkages between the capital and operational planning processes and the operating expenditure planning process.
- In a related sense, linking of operating expenditure and service level requirements and outcomes.
- An ongoing focus on the future efficiency benefits from the merger and more generally.
- Improved understanding of the difference between the financial and regulatory treatment of operating expenditure items and greater focus on the statutory operating expenditure limit set by the Regulator.
- Greater rigour around the regulatory operating expenditure estimate for each year of the review period in general including the ability to reconcile various views of expenditures from different sources (for differing purposes within TasWater), particularly in terms of actual regulatory operating expenditure, and to ensure ongoing management, review and reprioritisation of regulatory operating expenditure occurs.

Final Comment

Through this review, Jacobs has had regard to the impact of the proposed expenditure and this review's findings on TasWater's business, its customers and its prices.

Jacobs recognises that for PSP2 prices are more likely to be determined by price constraints than by proposed expenditure limits, and so there will likely be limited impact on TasWater's business and its customers as a result of the findings of this review. TasWater has a significant program of compliance-driven capital expenditure ahead, which will have a causal impact on operational expenditure that will be needed to operate and maintain the new infrastructure.

However, TasWater's corporate asset management systems and business processes that enable the planning, delivery, monitoring and reporting of its capital and operating expenditure needs significant attention to achieve a level of robustness that would be expected of a mature water utility in Australia – for its internal business processes and for its regulatory submissions.

Important note about this report

The sole purpose of this report and the associated services performed by Jacobs is to assist the Tasmanian Economic Regulator, as part of its price determination investigation, to determine the maximum water and sewerage charges TasWater will be permitted to impose for the second regulatory period commencing on 1 July 2015. This is in accordance with the scope of services set out in the contract between Jacobs and the Client.

In preparing this report, Jacobs has relied upon, and presumed accurate, any information (or confirmation of the absence thereof) provided by the Client, TasWater and from other sources. Except as otherwise stated in the report, Jacobs has not attempted to verify the accuracy or completeness of any such information. If the information is subsequently determined to be false, inaccurate or incomplete then it is possible that our observations and conclusions as expressed in this report may change.

Jacobs derived the findings in this report from information sourced from the Client, TasWater and available information in the public domain at the times outlined in this report. The passage of time, manifestation of latent conditions or impacts of future events may require further examination of the project and subsequent data analysis, and re-evaluation of the data, findings, observations and conclusions expressed in this report. Jacobs has prepared this report in accordance with the usual care and thoroughness of the consulting profession, for the sole purpose described above and by reference to applicable standards, guidelines, procedures and practices at the date of issue of this report. For the reasons outlined above, however, no other warranty or guarantee, whether expressed or implied, is made as to the data, observations and findings expressed in this report, to the extent permitted by law.

This report should be read in full and no excerpts are to be taken as representative of the findings. No responsibility is accepted by Jacobs for use of any part of this report in any other context.

This report has been prepared on behalf of, and for the exclusive use of, Jacobs's Client, and is subject to, and issued in accordance with, the provisions of the contract between Jacobs and the Client. Jacobs accepts no liability or responsibility whatsoever for, or in respect of, any use of, or reliance upon, this report by any third party

1. Introduction

1.1 Background

Independent regulation of prices in the Tasmanian water and sewerage industry

Independent regulation of prices in the Tasmanian water and sewerage industry commenced on 1 July 2012 with the first regulatory period covering the three financial years between 1 July 2012 and 30 June 2015. During the first regulatory period the three previous regulated entities (Ben Lomond Water, Cradle Mountain Water and Southern Water) were required to comply with a price determination made by the Regulator on 30 May 2012, outlining prices and service standards that were to apply during the first regulatory period.

On 1 July 2013 the assets, liabilities and employees of the previous regulated entities and Onstream (the common services provider to the previous regulated entities) were transferred to a new, single regulated entity - the Tasmanian Water and Sewerage Corporation (TasWater). Under the *Water and Sewerage Corporation Act 2012* the price determinations made and price and service plans developed as part of the 2012 Price Determination Investigation continued to apply to the TasWater until the end of the first regulatory period on 30 June 2015.

On 5 June 2013 the Regulator declared that the second regulatory period will cover a period of three years from 1 July 2015 to 30 June 2018 inclusive.

Context of this independent expenditure review by Jacobs

Under the *Water and Sewerage Industry Act 2008* the Regulator is required to, periodically, make a price determination that applies to a regulated entity in respect of a regulated service. Before the Regulator makes a price determination, the *Water and Sewerage Industry (Pricing and Related Matters) Regulations 2011* require the Regulator to conduct a price determination investigation.

The purpose of the current price determination investigation is to gather information to assist the Regulator in determining the maximum water and sewerage charges TasWater will be permitted to impose for the second regulatory period commencing on 1 July 2015. Whilst prices are more likely to be determined by price constraints in the short-term, the Regulator expects that revenue limits, which are determined by costs and asset values, will become increasingly important in the medium to long term.

In the context of its legislated objectives, the Regulator seeks to ensure that only efficient costs are incurred in providing regulated services and only efficient values for those assets required to deliver the regulated services, are taken into account in determining the regulated revenue. Specifically, under section 15 of the *Water and Sewerage Industry Act 2008*, the Regulator's objectives include:

- (b) the promotion of efficient long-term investment in water infrastructure and sewerage infrastructure, so as to achieve the lowest sustainable costs of the provision of water services and sewerage services;
- (c) the promotion of efficient pricing for regulated services;

The Regulator's current price determination investigation will examine, amongst other things, the Tasmanian water and sewerage industry's operating and capital expenditure from three different perspectives:

- expenditure that has occurred since the commencement of the current determination on 1 July 2012;
- expenditure that is budgeted to occur during the 2014-15 financial year; and
- TasWater's proposed expenditure for the next regulatory period.

The current price determination investigation will be based on information provided by TasWater in its proposed Price and Service Plan, which was submitted to the Regulator on 29 August 2014; and the findings of an independent expenditure review (this Jacobs review).

1.2 Terms of Reference

The Regulator engaged Jacobs to undertake a review of the adequacy, appropriateness and efficiency of the levels of operating and capital expenditure incurred by Ben Lomond Water, Cradle Mountain Water and Southern Water (the previous regulated entities) and TasWater's current, forecast and proposed levels of operating and capital expenditure, including an assessment of asset values. This includes an assessment of the efficiency and prudence of:

- i. the actual operating expenditure incurred by the previous regulated entities for the period 1 July 2012 to 30 June 2013 to the extent necessary to assess the efficiency of TasWater's proposed operating expenditure for the period from 1 July 2015 to 30 June 2018;
- ii. the actual capital expenditure incurred by the previous regulated entities for the period 1 July 2012 to 30 June 2013;
- iii. the actual operating expenditure incurred by TasWater for the period 1 July 2013 to 30 June 2014 to the extent necessary to assess the efficiency of TasWater's proposed operating expenditure for the period from 1 July 2015 to 30 June 2018;
- iv. the actual capital expenditure incurred by TasWater for the period 1 July 2013 to 30 June 2014;
- v. TasWater's budgeted operating expenditure for the period from 1 July 2014 to 30 June 2015 to the extent necessary to assess the efficiency of TasWater's proposed operating expenditure for the period from 1 July 2015 to 30 June 2018;
- vi. TasWater's budgeted capital expenditure for the period from 1 July 2014 to 30 June 2015;
- vii. TasWater's proposed operating expenditure for the period from 1 July 2015 to 30 June 2018; and
- viii. TasWater's proposed capital expenditure for the period from 1 July 2015 to 30 June 2018 so as to ensure that planned capital expenditure is directed to the most appropriate projects at an efficient cost.

This is summarised in **Figure 1**.

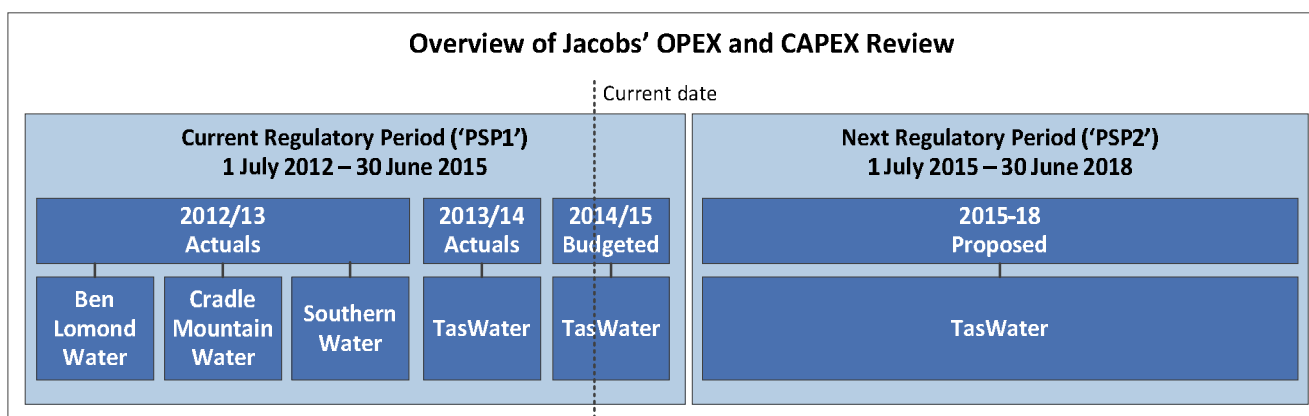


Figure 1 – Overview of Jacobs' review of OPEX and CAPEX

Jacobs is required to assess the prudence of capital expenditure to determine how much of the capital expenditure incurred / to be incurred during the current regulatory period ending on 30 June 2015 should be included into TasWater's Regulatory Asset Base (RAB) for the start of the upcoming regulatory period, in calculating allowances for the return on, and the return of, capital.

In conducting its assessment Jacobs is to undertake a strategic analysis of TasWater's planning and asset management; and examine the total level of expenditure, in addition to assessing expenditure on an individual activity/project basis. The Regulator expects that a broader, high-level assessment of expenditure will have regard to the impact on TasWater's business, its customers and its prices.

The outcomes of the review will be used to ensure that only efficient costs incurred in providing regulated services and only efficient values of those assets required to deliver the regulated services, are taken into account in determining the regulated revenue. In this regard, the Regulator seeks to set prices which do not reward inefficient investment and asset management decisions, or inefficient operations and practices.

1.3 Approach to this Review

Jacobs conducted an evidence based review – testing the foundations on which TasWater’s (and its legacy regional organisations’) expenditure decisions have been based. This necessarily involved assessing how TasWater’s strategic objectives translated into “on the ground” expenditure proposals.

This review was conducted through discussions with relevant TasWater personnel across TasWater’s business and reviews of TasWater corporate and project-specific documentation. TasWater’s Draft PSP2 submission to the Regulator served as the principal reference document of this review, along with business cases and supporting documentation for individual capital projects, as well as supporting information provided in response to RFIs, site visits and telephone discussions with TasWater personnel.

Jacobs’ draft report was completed on 3 November 2014 and provided to the Regulator, TasWater, the EPA, DHHS and DPIPWE. A findings workshop was held for the Regulator, the EPA, DHHS¹ and DPIPWE on 7 November 2014. Written responses to the draft report were received from TasWater, the Regulator and DHHS.

This Jacobs review and its findings are mindful of the context of the Tasmanian water and sewerage industry – most notably that this review is being conducted a little over 1 year after TasWater commenced operations – with TasWater having inherited assets, projects, systems and data from its three legacy regional organisations (and Onstream). TasWater inherited a significant number of compliance challenges in its water and wastewater systems that will take multiple regulatory periods to address, and was tasked with the challenge of preparing its PSP2 submission while continuing to develop its state-wide business processes, which impact its capital and operating expenditure planning and prioritisation.

TasWater were cooperative throughout this review but had challenges providing timely information. Much of TasWater’s information was provided quite late in the review and some information – particularly relating to OPEX and asset valuations – is very limited, which has constrained Jacobs’ ability to make detailed findings in relation to the proposed expenditure program.

Jacobs’ findings, recommendations and proposed improvement opportunities are presented throughout this report and are summarised in **Appendix C**.

1.4 Overview of TasWater and its Performance

As discussed within its Draft PSP2 submission, TasWater provides two essential services in Tasmania:

- the sourcing, treatment and delivery of reliable, quality drinking water to customers; and
- the collection, transportation, treatment and safe return of the wastewater to the environment.

TasWater provides these services for the majority of Tasmania’s 500,000 residents through 75 water systems and 120 sewerage systems across the state of Tasmania – including metropolitan, regional and remote locations. To deliver these services it owns and operates assets in excess of \$2 billion dollars in (accounting fair) value, including:

- 6,000km of water mains (servicing over 200,000 connections)
- 60 water treatment plants and dosing stations
- 4,000km of sewer gravity mains and 380km of sewer rising mains (servicing nearly 180,000 connections)
- 728 sewer pumps stations
- 33 Level 1 and 80 Level 2 sewage treatment plants

¹ Representatives from the DHHS were unable to attend at last minute

TasWater is owned by Tasmania's 29 local government councils and is governed by a significant number of legal instruments, which are discussed within its draft PSP2 submission and other corporate documents.

1.4.1 TasWater's current performance challenges

As discussed in its draft PSP2 submission and its Annual Performance Report 2013/14, TasWater currently faces a range of performance challenges with its water and sewerage systems, which have influenced its proposed expenditure in its draft PSP2 submission:

- 26 towns are on long term boil water alerts or public health alerts, many of which are remote, with small customer bases and limited options for removal or combining with other supply networks. See **Table 1**.
- As at June 2014, TasWater's level 2 sewage treatment plants have less than 50% compliance with discharge limits and the volume of sewage compliant, indicating a need for major improvements and significant investment into sewage treatment infrastructure. See **Table 2**.
- Many wastewater reticulation and treatment systems adjacent to sensitive receiving water environments including oyster leases, World Heritage areas and registered RAMSAR wetlands.
- For 2013/14, TasWater did not achieve 11 of its 22 Customer Service Code performance indicator targets (as a state average)². While TasWater did meet its targets for all customer related indicators, it did not achieve a range of prominent infrastructure performance indicators such as: unplanned water supply interruptions (per 100km); average durations of planned and unplanned water supply interruptions; sewer breaks and chokes (per 100km); and average time to attend sewer spills, breaks and chokes.

Table 1 – TasWater's drinking water quality performance and forecasting against its strategic objectives³

Strategic Objective: Provide products & services that deliver positive outcomes for Tasmania						
Key measures: Environment, public health and service delivery performance						
KPIs	Regulator's Benchmark	EOY 2013/14 Estimate	2013/14 Actual	Targets		
				2014/15 Forecast	2015/16 Forecast	2016/14 Forecast
Percentage of drinking water systems compliant with ADWG microbiological guidelines	100%	92%	94%	95%	98%	99%
Number of towns on long term boil water alerts or public health alerts	0	25	26	20	13	8
Percentage of systems compliant with average fluoride concentration within target range 0.8-1.2 mg/L	100%	85%	91%	95%	100%	100%

Table 2 – TasWater's wastewater quality performance and forecasting against its strategic objectives⁴

Strategic Objective: Provide products & services that deliver positive outcomes for Tasmania						
Key measures: Environment, public health and service delivery performance						
KPIs	Regulator's Benchmark	EOY 2013/14 Estimate	2013/14 Actual	Targets		
				2014/15 Forecast	2015/16 Forecast	2016/14 Forecast
% of treated volume fully compliant with EPA requirements (NWI E4)	100%	50%	41%	58%	61%	67%

² Jacobs notes that the Customer Service Code only requires TasWater to meet the minimum service standards before the end of PSP2 (30 June 2018). TasWater has proposed a service standard transition path in Table 5 of its Draft PSP2 submission.

³ Source: TasWater Annual Performance Report 2013/14, Table 1, noting that the term 'potable systems' has been replaced with 'drinking water systems' to reflect terminology in the DHHS regulatory framework.

⁴ Source: TasWater Annual Performance Report 2013/14, Table 2

2. Strategic review of TasWater planning and Asset Management

2.1 Review Approach

A strategic review was performed on TasWater's systems for asset management and capital investment planning. The objective of the review was to test the robustness of these systems/processes and assess their alignment with TasWater's regulatory requirements and contemporary (risk-based, service-driven) asset management practices in the Australian urban water industry. This includes the principles defined within the suite of recently published Asset Management International Standards *ISO 5500X:2014*, the Internal Standard for Risk Management *AS/NZS ISO 31000:2009*, and the numerous industry water industry asset management guidelines produced by the Water Services Association of Australia (WSAA).

An evidence based strategic review was employed – conducted through discussions with relevant TasWater personnel, a review of TasWater corporate documentation and through testing of the processes with the capital expenditure program proposed by TasWater for the 2015 – 2018 regulatory period.

As with the rest of the Jacobs review, this strategic review and its findings are mindful of the context of the Tasmanian water and sewerage industry – most notably that this review is being conducted a little over 1 year after TasWater commenced operations – with TasWater having inherited assets, data and AM systems from the three regional organisations (and Onstream); which as noted by TasWater in its 2013/14 Annual Performance Report were themselves “still very much in their infancy and had inherited data and systems of varying sophistication, accuracy and completeness”. Limited tactical asset management documentation is currently available in TasWater and a review of operational level documentation (data capture forms, works procedures, etc.) was not conducted as part of this review.

2.1.1 The Asset Management discipline and the basis of this review

The global Asset Management (AM) discipline has spawned in numerous frameworks, maturity scales and associations. All recognised contemporary frameworks, while exhibiting different structures and terminology, recognise the following essential components of an AM System:

- The need for an asset management system to have a strong ‘organisational awareness’ – with strong leadership from senior management and AM decisions to be driven by the organisation’s objectives and obligations (service delivery within the context of TasWater)
- The need for a robust system of risk-based decision making frameworks, processes and plans – with a clear ‘line of sight’ across policy, strategy, tactical and operational levels, and over the asset life-cycle (create/acquire, operate/utilise, maintain, dispose/renew)
- The important role of information management to facilitate objective and systematic asset management decision making and reporting
- The need for a performance monitoring and continuous improvement mindset across the entire Asset Management System

A significant and recent convergent event has been the development and publication of the suite of Asset Management International Standards: *ISO 55000:2014*, *ISO 55001:2014* and *ISO 55002:2014*. The standards were developed over five years and with participation from 31 countries. Relevant for this review, the Water Services Association of Australia (WSAA) was a member of the Standards Australia Mirror Committee that represented Australia in the standards development process.

Distilled down, *ISO 55001:2014 Asset Management - Management systems - Requirements* specifies 27 ‘requirements’ of an Asset Management System that enables an organisation it to consistently and sustainably achieve its objectives through the effective and efficient management of its assets.

It should be noted that the ISO 5500X suite are high-level organisational management standards akin to ISO 9001:2008 Quality Management Systems and ISO 14001:2004 Environmental Management Systems. While initially triggered by the success of PAS 55:2008 (which focuses on infrastructure asset management), the ISO 5500X standards do not provide specific strategic or tactical guidance for infrastructure organisations or specific industries (e.g. urban water).

Other popular asset management guidelines and frameworks in Australia - particularly WSAA's Aquamark framework and IPWEA's International Infrastructure Management Manual (IIMM) - do provide more specific guidance for infrastructure organisations and have long been employed by Australian urban water utilities in shaping their Asset Management Systems. In light of the release of the ISO 5500X standards, WSAA and IPWEA are updating their guidance. IPWEA is updating the IIMM (expected 2015) and in the interim has released a 'Meeting ISO 55001: Quick Guide' supplement to the IIMM 2011 Edition. WSAA is currently undertaking several ISO 5500X related projects to ensure the Australian Water Industry (i.e. its members) can be best served through the complementary guidance of ISO 5500X and Aquamark. It is a positive observation that TasWater's General Manager Asset Management is a member of the WSAA Aquamark 2016 Steering Group.

Organisational Certification to ISO 55001 in Australia will be possible soon, where Certified Asset Management Assessors will be recognised by the Asset Management Council (Australia) based on an ISO 55001 Auditor/Assessor Competency Specification developed by the Global Forum on Maintenance and Asset Management (GFMAM). The Asset Management Council is a member of GFMAM.

In the interim, and to help organisations assess their asset management capabilities in preparation for certification, the Institute of Asset Management (IAM, UK – also a member of the GFMAM) has developed a high-level Self-Assessment Methodology (SAM) for ISO 55000/1/2:2014 tool and associated maturity scale.

Recommendation: Given TasWater is seeking to align its AM System with the ISO 5500X standards, it will benefit TasWater to employ the IAM Self-Assessment Methodology tool as it progresses through its Asset Management improvement 'journey'.

Part of this review has been informed by the IAM SAM tool (see **Section 2.2.1**). However the scope of this Jacobs review has been limited to the Terms of Reference defined by the Regulator (see **Section 1.2**) and so would not constitute a complete external assessment as defined by the SAM General Guidance Notes. A condensed SAM approach has been adopted appropriate for the focus of this expenditure review and TasWater's current AM maturity.

More appropriate for this review, Jacobs have reviewed TasWater's Asset Management System (and improvement activities) against the 10 'key elements' of an Asset Management System defined within Annex B of ISO 55000:2014 (and linked to the 27 requirements through the schematic in Annex B of ISO 55002:2014). The 10 key elements include:

- Organisational plans and organisational objectives (Stakeholder and Organisation Context)
- Asset Management Policy
- Strategic Asset Management Plan
- Asset Management Plans
- Implementation of Asset Management Plans
- Plans for developing AM System + relevant support
- AM System + relevant support documents
- Asset Portfolio
- Performance Evaluation and Improvements

2.2 TasWater Asset Management Review

2.2.1 Overall status of TasWater's Asset Management System

TasWater has outlined the status of its Asset Management (AM) System and its improvement program in its Draft PSP2 submission to the Regulator (particularly Section 5.3.3). TasWater's key messages, which have been consistent through Jacobs' review, include:

- In May 2013, a new state-wide operating model based was introduced based on the principles of the ISO 55000 series and tailored to suit the circumstances and priorities of the new corporation.
- TasWater is currently developing the strategic planning component of its AM System. An interim Asset Management Policy is presently in place and TasWater's Strategic Asset Management Plan (SAMP) are required by the Regulator to have an approved SAMP in place by 30 June 2015 and independently appraised by 31 August 2015. These are running concurrently with the finalisation of the Corporate Plan and the PSP2.
- TasWater are facing a range of challenges relating to poor asset performance – including compliance issues and underperformance against a range of asset performance targets⁵.
- TasWater having inherited assets, data and systems from its legacy organisations. A significant challenge that continues to be faced is the lack of quality asset data to help inform asset management strategy and decisions. TasWater have had to make decisions for the PSP2 submission based on the best information available.
- TasWater is developing its asset management information systems, reviewing its asset data structures and hierarchies, and undertaking a range of asset data collection and analysis activities.
- The AM System will develop with the maturity of TasWater. TasWater expects that by the end of PSP2 (30 June 2018) it will have completed service delivery planning for the corporation and will have developed Asset Management Plans (AMPs) for each system.

These key messages have been a consistent finding throughout the Jacobs review and are reflected in the high-level assessment of TasWater's maturity to ISO 55001:2014 using the IAM SAM, shown in **Figure 2**. Guidance Notes. The Self-Assessment Methodology uses a 0-4 maturity scale for each requirement, where a score of 3+ equates to *compliance* with the requirement within ISO 55001:2014. Within the Figure 2 radar chart, compliance (scores of 3-4) are shown as the blue outer annulus and non-compliance (scores of 0-2) are the white inner circle.

As mentioned in Section 2.1.1, a condensed SAM approach has been adopted appropriate for the focus of this expenditure review and would not constitute a complete external assessment as defined by the SAM Guideline

Finding: Overall, Jacobs finds that while TasWater is young in its maturity being a newly formed corporation, its senior management and staff demonstrate a strong commitment to a service-driven, organisation-wide approach to Asset Management. This is evidenced in corporate documents and through discussions with the CEO, senior management and TasWater personnel. They are a passionate group who see the state-wide reach of TasWater as an opportunity to provide a strong systematic approach to Asset Management that will allow positive outcomes to be delivered to Tasmania.

Jacobs endorses the current Asset Management activities of TasWater and the top-down development of its AM System (while also progressing various tactical and operational activities in a pragmatic manner considering current constraints).

Within the SAM assessment, Jacobs finds that TasWater does not score a 'Maturity Level 0' for any requirements. Across all requirements it is apparent that, as a minimum, TasWater has identified the need for

⁵ As discussed in Section 1.4.1, Jacobs notes that the Customer Service Code only requires TasWater to meet the minimum service standards before the end of PSP2 (30 June 2018). TasWater has proposed a service standard transition path in Table 5 of its Draft PSP2 submission.

this requirement, and there is evidence of intent to progress it. – giving requirements at least a Maturity Level 1. TasWater have scored particularly strongly (Maturity Level 3) for its understanding of the external and internal issues and objective relevant to its Asset Management System, for its Asset Management Policy and for top management ensuring that responsibilities and authorities for key current AM roles are assigned and communicated.

Jacobs recognises that all infrastructure organisations are on an asset management journey and is confident that if TasWater delivers its proposed asset management improvement activities it will see a rapid improvement in its maturity scoring against the requirements of ISO 55001:2014.



No	Clause
4.1	Understanding the organization and its context
4.2	Understanding the needs and expectations of stakeholders
4.3	Determining the scope of the asset management system
4.4	Asset management system
5.1	Leadership and commitment
5.2	Policy
5.3	Organizational roles, responsibilities and authorities
6.1	Actions to address risks and opportunities for the asset management system
6.2.1	Asset management objectives
6.2.2	Planning to achieve asset management objectives
7.1	Resources
7.2	Competence
7.3	Awareness
7.4	Communication
7.5	Information requirements
7.6.1	Documented information general
7.6.2	Creating and updating documented information
7.6.3	Control of documented information
8.1	Operational planning and control
8.2	Management of change
8.3	Outsourcing
9.1	Monitoring, measurement, analysis and evaluation
9.2	Internal audit
9.3	Management review
10.1	Nonconformity and corrective action
10.2	Preventive action
10.3	Continual improvement

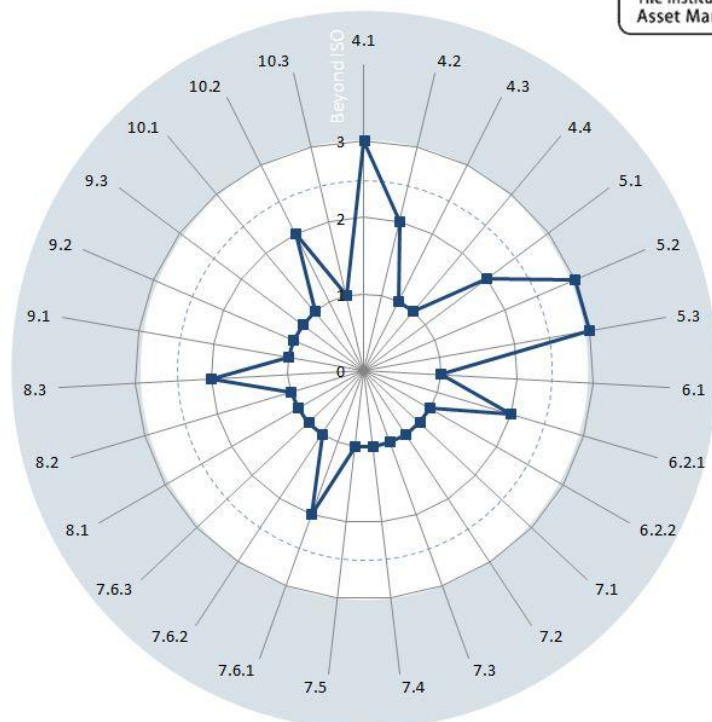


Figure 2 – High-level assessment of TasWater maturity to ISO 55001:2014 using the IAM SAM

2.2.2 Review of TasWater’s AM System against the 10 ‘key elements’ of ISO 55000:2014

The following section provides more detail of the Jacobs review of TasWater’s AM System and improvement activities against the 10 ‘key elements’ defined within ISO 55000:2014.

2.2.2.1 Organisational plans and organisational objectives (Stakeholder and Organisation Context)

As mentioned above, Jacobs finds that TasWater senior management do demonstrate leadership and commitment in relation to the development of its ISO 5500X-aligned AM System, and have a strong commitment to a service-driven, organisation-wide approach to Asset Management. TasWater have in place an active Asset Owners Steering Committee (AOSC), which is involved in material Asset Management business decisions (and endorsements within the Capital Projects Governance Framework), and whose membership includes the CEO and General Managers of Asset Management, Finance & Commercial, Works Delivery, and

Operations & Maintenance. TasWater also have an active Asset Management Working Group (AMWG) which reports to the AOSC and whose membership has representation from all three regions.

The development of the proposed AM approach has been communicated to and noted by the Board (7 March 2014 Board Meeting Report). A range of priority AM improvement activities are now being planned and implemented (the TasWater 'Asset Management Improvement Strategy') as part of the development of TasWater's AM System. These are discussed further in **Section 2.2.4**. The development of a robust AM System should ensure that TasWater's asset management objectives are aligned with its organisational objectives. The Department Manager Asset Strategy Planning and Performance is the project sponsor is responsible for the AM Improvement Strategy. Roles within the AM Improvement Strategy have been broadly mapped, although no responsibilities appear to have been formally assigned (such as through a RACI / responsibility assignment matrix). It is noted that TasWater should be currently developing the AM Improvement Strategy for presentation to the AOSC.

Recommendation: It is recommended that responsibilities be formally assigned within the current AM Improvement Strategy document and ultimately reside in the TasWater Strategic Asset Management Plan (SAMP, see **Section 2.2.5**).

At a high level, TasWater has identified relevant legislation and associated reference documents in its Asset Management Policy and the Draft PSP2. It would be expected that this should continue with the development of TasWater's regulated plans (such as the WWMP, DWQMP, DSMP and EMP) and that the specific requirements of legislation and TasWater's Operating Licence should be detailed within the Compliance Obligations Register discussed in TasWater's Compliance Plan (August 2014). Jacobs has also observed that specific obligations and performance targets have been used within certain tactical documentation (such as the draft Sewer Renewals Strategy), but has not seen them consistently referenced in business cases [**Improvement Opportunity**].

Jacobs is aware that TasWater do engage in discussions with external stakeholders (such as its technical regulators) to identify the determine the needs and expectations that impact its AM investment decision making. Jacobs has not sought for details on the mechanisms around which these interactions occur.

2.2.3 Asset Management Policy

TasWater do have an Asset Management Policy, which is Board-approved (March 2014) and structured consistent with good industry practice. The Policy is publically available on TasWater's website and scheduled to be reviewed in March 2015. The CEO is responsible for implementing the Asset Management Policy.

2.2.4 Plans for developing AM System (plus relevant support)

As mentioned above, TasWater are currently developing an Asset Management Improvement Strategy and concurrently implementing some priority AM activities. Through discussions with TasWater, it has been demonstrated that TasWater has a strong vision of where it wants to take its AM System, and have identified AM improvement activities across 5 categories, which are discussed further below:

- AM System Framework
- Other Asset Management Documentation
- Asset Management Information Systems
- Asset Management Data
- People (Training)

Recommendation: TasWater's proposed approach (of an improvement strategy/plan and concurrent high priority activities) is endorsed by Jacobs. Jacobs have not been provided the draft AM Improvement Strategy and so would expect all proposed AM improvement activities to be adequately defined, scoped, costed, scheduled and have an associated RACI responsibility matrix necessary for ASOC endorsement/approval.

AM System Framework

The Generic ISAM Model included in TasWater's 7 March 2014 Board Paper was developed by the Australian Asset Management Collaborative Group (AAMCoG) in 2011. While it is generally consistent with the principles of the ISO 5500X standards, it is not a direct representation of the ISO requirements.

Recommendation: WSAA and its member utilities are currently delivering several projects that seek to deliver guidelines to help Australian urban water utilities apply ISO 55001:2014 to their organisations, and to update Aquamark to address new aspects presented by this ISO Standard. Jacobs notes that TasWater's GM Asset Management is a member of the latter project's Steering Group and recommends that the guidelines from the first project be strongly considered by TasWater as it progresses the development of its Asset Management system.

Other Asset Management Documentation

TasWater's asset management documentation is currently very limited and should be developed through the asset management improvement process. TasWater's key efforts have focused on conducting the state-wide water, wastewater and dam risk assessments so that it can develop its regulated Wastewater Management Plan (WWMP), Drinking Water Quality Management Plan (DWQMP) and Dam Safety Management Plan (DSMP). Jacobs endorses this priority approach of TasWater, which will help ensure short and long term investment decisions can be made on a 'no surprises' basis.

Jacobs has also seen evidence that TasWater has commenced a risk-based approach for other asset performance risks (e.g. dry weather overflows through the CCTV program). TasWater are also planning to develop a range of other documentation.

- Its Enterprise Risk Framework (to ISO 31000)
- System based 10 year Asset Management Plans (including sequencing plans)
- State-wide Technical Standards
- As Constructed Data Specifications
- The major sewerage strategies for Greater Hobart and Greater Launceston

It is essential that as TasWater's AM System establishes a robust system of connected risk-based decision making frameworks, processes and plans – with a clear 'line of sight' across policy, strategy, tactical and operational levels, and over the asset life-cycle (create/acquire, operate/utilise, maintain, dispose/renew).

TasWater has begun producing a framework mapping its document and process structure across the asset life-cycle (see Figure 3). This framework is being mapped to the AM functions in WSAA's Aquamark framework and the AM requirements within the IIMM. Jacobs endorses the development of this framework.

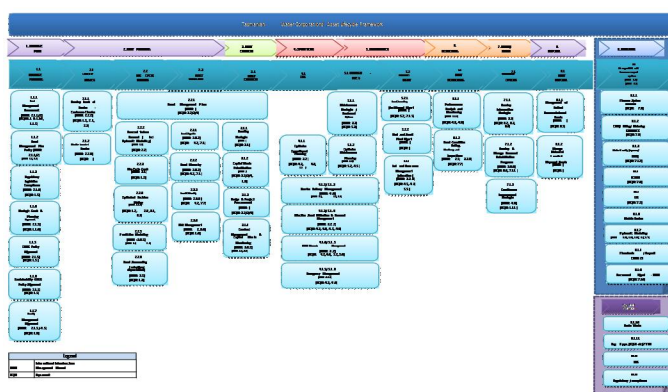


Figure 3 – TasWater asset lifecycle process framework [blurred]

Recommendation: TasWater should ensure that, for any risk-based decision making frameworks it develops, the framework should:

- Conduct a **performance assessment of all assets** (individual assets and asset classes) against the stated objectives, identification of gaps in performance against these, and defined acceptable risk levels. This should have explicit alignment with TasWater’s enterprise risk framework and strategic objectives.
- Define **critical and non-critical assets**, having regard to ‘asset functions’ (for each asset class) and ‘risk events’ with regards to TasWater’s service and performance requirements.
- Include processes for the identification, assessment and selection of **options** to address unacceptable performance and risk “gaps” on a prioritised basis. This risk treatment investment decision making should have systematic consideration of operating, capital and non-asset-specific activities; including clear demonstration of risk-cost trade-offs for discretionary expenditure projects and programs.
- Include processes for assessment and capture of **benefits** of capital works and other AM initiatives.

Recommendation: Jacobs recommends that, where available, TasWater should develop and test its decision making processes with the relevant WSAA Asset Management Guidelines (e.g. GSS1 Sewer Blockage Management).

Asset Management Information Systems

TasWater acknowledges that it faces challenges in its collection, storage, and analysis of asset and service performance data with its current asset management information system (AMIS) and has proposed the procurement and implementation of a dedicated AMIS. TasWater have discussed this further in Section 4.2.4 of the Draft PSP2 submission. Jacobs also understands that TasWater intends to consolidate its Geographic Information Systems (GIS) from the legacy regional organisations into a single GIS. Jacobs strongly endorses these activities.

Asset Management Data

It is understood from discussion with TasWater that a range of field and desktop activities are being planned and implemented to improve TasWater’s asset data. Some of these are understood to include a sewer CCTV program, the development of system schematics and hydraulic models, and the development of a service land layer in GIS. It is unclear if any data cleansing, validation and harmonisation activities are proposed to integrate the data sets from the legacy regional organisations, particularly given the inconsistent data quality understood to have been inherited by TasWater.

People (Training)

It is understood from discussion with TasWater that a program of Asset Management training to IPWEA’s NAMS.Plus is being planned for Asset Management personnel. Jacobs endorses this activity.

2.2.5 Strategic Asset Management Plan

TasWater is currently developing its Strategic Asset Management Plan (SAMP) as one of its priority AM improvement activities. TasWater has been directed by the Regulator to have an approved SAMP in place by 30 June 2015 and be independently appraised by 31 August 2015. Jacobs finds this reasonable given that TasWater is in the early stages of developing its AM System and the ISO 5500X suite of standards were published in January 2014.

Jacobs notes that TasWater’s Water and Sewerage Licence (Schedule 2, Clause 1.1.2 – effective 1 July 2013) requires it to prepare an Asset Management Plan(s). The term ‘Strategic Asset Management Plan’ is effectively a new entry to the Asset Management lexicon through the ISO standards – the nearest equivalent document being previously called an ‘Asset Management Strategy’ (noting that you can have an organisation’s strategy for asset management and theme-specific asset management strategies e.g. odour & corrosion strategies). Within

the new ISO lexicon, a SAMP is an organisation's plan for its AM **system**, while an AMP is an organisation's plan for its **assets** (i.e. a tactical document). As defined in Section 4.1.1.2 of ISO 55002:2014 "The SAMP should be a high level plan that contains the asset management objectives. It should be used to develop the asset management plan(s), which should set out the asset level activities."

Recommendation: Discussions through this review suggest to Jacobs that TasWater and the Regulator should make sure there are clear and aligned expectations on what Asset Management Plan is required to satisfy TasWater's Water and Sewerage Licence – whether TasWater's SAMP and/or its suite of AMPs.

2.2.6 Asset Management Plans

TasWater has not yet developed its state-wide Asset Management Plans (AMPs), which is reasonable given it has yet to develop its SAMP and associated planning processes and decision criteria for developing its AMPs. In the interim, TasWater is able to employ the 30 year AMPs from its legacy regional organisations, which can provide information on the asset portfolio (e.g. age profile, capacity), service performance levels and planned renewals expenditure – albeit to different levels of granularity across the three regions.

Section 7.10 of the Draft PSP2 and discussions with TasWater personnel indicates that TasWater intends to develop system-based 10-year AMPs by the end of PSP2 (30 June 2018 - which will contain growth plans amongst other information) as well as AMPs for its key asset categories (e.g. reservoirs). Jacobs appreciates that the structure of the AMPs has not yet been developed by TasWater but notes that there are a large number of systems - 112 wastewater systems and 76 water supply systems. Given AMPs should be living documents that require periodic updates, this may create a sizeable workload.

Recommendation: TasWater should investigate a risk-based approach to the development of the AMPs – their timing and level of detail. It may be appropriate to develop some lower risk/priority system AMPs at a high level, while other higher risk/priority systems developed at a detailed level.

Recommendation: The interaction of the AMPs with TasWater's other regulated plans (the WWMP, DWQMP, DSMP and EMP) also needs to be considered so that documentation is minimised and consistency is maintained. The possibility of using standard data reports for certain sections of the AMPs from TasWater's impending AMIS should be investigated (renewals profiles, service performance levels, etc.).

2.2.7 Implementation of Asset Management Plans

Jacobs notes that TasWater has not yet developed the supporting processes to control the implementation of its AMPs, which is reasonable given it has yet to develop its SAMP and is in the early stages of developing its AM System. **Recommendation:** Jacobs would expect this to occur in due course and recommend that checks are in place to ensure the current Capital Planning and Prioritisation process is updated accordingly. It is Jacobs' opinion that it would be reasonable to expect these supporting processes to be developed and implemented such that high risk/priority AMPs can maturely inform TasWater's PSP submission for its third regulatory period.

2.2.8 AM System (plus relevant support documents)

Jacobs finds it reasonable that TasWater is in the early stages of developing its AM System given it commenced operation as a corporation in July 2013. Evidence to date gives Jacobs confidence that the requirements for an AM System (and relevant supporting documentation) defined in the ISO 5500X standards will be achieved by TasWater if it delivers its proposed asset management improvement activities and maintains its organisational commitment to evolving its AM maturity.

2.2.9 Asset Portfolio

TasWater is aware of the limitations and relative accuracy of the information contained within its asset register. Jacobs notes and endorses TasWater's ongoing works to improve its asset register through a range of (desktop and field) asset data improvement projects and the implementation of a fit for purpose Asset Management Information System.

2.2.10 Performance Evaluation and Improvements

Jacobs finds it reasonable that a range of performance evaluation and improvement requirements outlined in ISO 55001:2014 have not yet been developed by TasWater given it is in the early stages of developing its AM System (e.g. internal auditing requirements for the AM system and corrective actions for non-conformances).

Recommendation: Jacobs would expect the Asset Management Improvement Strategy to clearly identify and address the performance evaluation and improvements requirements outlined in ISO 55001:2014.

Performance Evaluation

Jacobs endorses the structure and content of TasWater's Annual Performance Report 2013/14 and its ongoing performance benchmarking through the National Water Commission / WSAA National Performance Reports.

Improvement Activities

Clearly, TasWater's current Asset Management Improvement Strategy represent a major improvement activity, which Jacobs strongly supports. Jacobs also endorses the Performance Indicator Process Improvement Plan discussed in the TasWater Annual Performance Report 2013/14.

Jacobs also endorses TasWater's active involvement in Asset Management activities within the Australian water industry – such as WSAA's Asset Management Program. Jacobs notes that TasWater personnel are involved in Steering Committees for several WSAA Asset Management projects, including the 2016 Aquamark project, and that TasWater's legacy regional organisations were involved in the 2012 WSAA Aquamark process benchmarking project.

2.3 TasWater's Capital Planning and Prioritisation Process

2.3.1 TasWater's current process is appropriate for its PSP2 submission

This strategic review tested the robustness of TasWater's capital planning and prioritisation process⁶ to confirm whether key current capital works and future capital works needs have been systematically identified such that:

- The most pressing CAPEX works requirements have been included in the program for the upcoming regulatory period
- The CAPEX program aligns with the long-term strategic direction of the organisation, is deliverable (from both a financial and resource perspective) and presents tolerable risk.

Finding: Jacobs has found that TasWater's capital planning and prioritisation process has been appropriate for its PSP2 submission. It allows TasWater to capture and prioritise its existing commitments; its key water, wastewater and dam safety risks; and its other identified CAPEX projects in a systematic and easy-to-apply process that balances 'risks of deferring the project' and corporate strategic objectives. Its role within the Project Management Framework (capital delivery gating process) is clear and responsibilities have been assigned.

Jacobs has seen that TasWater has applied the process in an iterative fashion with consideration of financial, resource or other constraints and as the regulatory plans (WWMP, DWQMP and DSMP) have been developed.

However, the process will need to be refined for future regulatory submissions when existing commitments have been delivered and TasWater will need to balance compliance expenditure with greater levels of renewals, growth and performance improvement expenditure that will be better understood through the sequencing plans and asset management plans that TasWater will be developing through PSP2.

⁶ Defined within the *Capital Projects Prioritisation Procedure* and applied through the *B14 160738 Capital Works Program PSP Version*

Note that this strategic review informs, but is separate to, the prudence and assessment of TasWater's proposed capital expenditure for PSP2, which is discussed in **Section 3**.

Improvement Opportunity: When refining the capital planning and prioritisation process, TasWater should seek to make some further improvements. Some of these improvements relate to capturing relevant information for TasWater's regulatory reporting requirements, which are discussed in **Section 3.5**.

- Develop a robust approach to cost estimating. No evidence of a formal, consistent, and documented approach to cost estimation (including unit rates, guidance for the allocation of overheads, contractor costs, discount rates, etc.) has been sighted by Jacobs. The 20 sample CAPEX projects reviewed in **Section 3.3** support this finding. At present only contingency allocations have been standardised within the capital planning and prioritisation process.
- Allow for sensitivity testing of project priorities (e.g. risk assessment and strategic objectives weightings). TasWater has indicated in its response to the Jacobs draft report that it intends to undertake sensitivity testing during FY2015.
- Align the Project Infrastructure Type and Asset Class definitions with the asset categories in the Ring Fencing Guideline
- Allow for project expenditure to be apportioned across multiple Ring Fencing cost drivers, asset categories and business segments (including regulated and unregulated expenditure)
- Identify the intended RAB to which the expenditure will be capitalised – whether the RAB_{existing} or RAB_{new}.

2.3.2 Testing the Alignment of PSP2 with the Capital Prioritisation Process

Mandatory projects are defined by TasWater in its Capital Projects Prioritisation Procedure as:

- Legacy projects that have been carried over from the previous PSP; and
- Contractually obliged projects (e.g. legislative/regulatory, third party of Infrastructure Australia funded)

TasWater's Capital Projects Prioritisation Procedure has been developed to prioritise projects in the following high-level order:

Priority 1. Mandatory commitments such as those driven by OH&S, EPA and DHHS commitments are identified and subtracted from the target capital budget.

Priority 2. Enhancement/augmentation projects that have received board endorsement

Priority 3. Remaining project bids and renewal programs are prioritised on the basis of the combined risk assessment and strategic objectives alignment assessment

This prioritisation process (and its use in the 'subtractive' approach to developing the PSP2 Capital Works Program) is also illustrated in **Figure 6** (Section 3.2.2). Jacobs tested and found alignment of the Capital Works Program - and thus the Capital Projects Prioritisation Procedure – with:

- The DHHS 2014 Priority List for drinking water supply systems⁷
- TasWater's Wastewater Management Plan (WWMP) state-wide risk assessment (which includes system non-compliances to EPA Environmental Protection Notices) – for wastewater mandatory projects

This is presented in **Table 3** and **Table 4** and discussed below, which show that TasWater's highest priority drinking water supply and wastewater compliance projects are included in the PSP2 capital works program (or are being addressed through PSP1). A review of TasWater's Dam Safety Management Plan indicates this is also the case for dam safety mandatory projects.

⁷ All of TasWater's drinking water supply systems are required to comply with the ADWG; being mandated through Clause 7.1 of the Tasmanian 2005 Drinking Water Guidelines. The DHHS provides TasWater with a public health priority list for capital works on non-compliant or currently inadequate drinking water supply systems in Tasmania: the "DHHS Priority List".

Jacobs understands that lower priority systems that have proposed expenditure for PSP2 have been included because they are an existing mandatory commitment from the prioritised process of the legacy regional organisations and/or they are a component of a larger project (e.g. Lady Barron WTP as a part of the Flinders Island project, which also includes Whitemark).

Table 3 – Comparison of TasWater’s assessment of most ‘at risk’ wastewater catchments and TasWater’s Capital Works Program

Highest Risk L2 Treatment Systems ⁸		Data from Capital Works Program Prioritisation ⁹	
Risk Rank	Wastewater System	Issue being addressed by TasWater in PSP1 and/or PSP2?	PSP Project No.
1	Longford	Yes (2013/14 - 2016/17)	556, 795
2	Wynyard	Yes (2013/14 - 2018/19)	412, 413, 480, 489, 582, 764
3	Westbury	Yes (2013/14 - 2016/17)	585, 797
4	Margate	Yes (2013/14 - 2017/18)	42, 57
5	Electrona	Yes (2013/14 - 2017/18)	42, 57, 78
6	Oatlands	Yes (2015/16)	87
7	Pardoe	Yes (2013/14 - 2015/16)	351, 455, 689, 711
8	Ti Tree Bend	Yes (2013/14 - 2016/17)	558, 586, 639, 850
9	Cambridge	Yes (2014/15 - 2017/18)	91, 241
10	Brighton	Yes (2013/14 - 2016/17)	67
11	Ranelagh	Yes (completed March 2013) ¹⁰	
12	Latrobe	Yes (2013/14 - 2015/16)	292, 352
13	Smithton	Yes (2013/14 - 2019/20)	381, 394, 416, 438, 561, 579, 588, 606, 680, 715, 716
14	Swansea	Yes (2015/16)	59
15	Prospect Vale	Yes (2013/14 - 2015/16)	595, 636, 856
16	Legana	Yes (2013/14 - 2017/18)	323, 598
17	Blackmans Bay	Yes (2013/14 - 2017/18)	42, 57, 173
18	Cameron Bay	Yes (2015/16) ¹¹	96, 216, 219 876
19	Port Sorell	No (No direct projects listed)	295, 332, 721
20	Bicheno	Yes (2014/15 - 2016/17)	66

[Note that some systems have projects proposed for PSP1 and/or PSP2 that have been understood, based on the short descriptions in the Capital Works Program spreadsheet, to not be related to the compliance issues in the system. Hence they have been flagged as ‘no’.]

⁸ Source: 'State-wide WWMP Level 1 2014 risk assessment Oct'

⁹ Source: 'B14 160738 Capital Works Program PSP Version'

¹⁰ Source: TasWater response to [Jacobs] PSP2 Expenditure Review Draft Report (27 November 2014)

¹¹ Source: TasWater response to [Jacobs] PSP2 Expenditure Review Draft Report (27 November 2014); project 219 to be completed in FY2015/16

Table 4 – Comparison of DHHS priority drinking water supply systems and TasWater's Capital Works Program

DHHS Priority List for TasWater Drinking Water Supply Systems ¹²		Data from Capital Works Program Prioritisation ¹³	
DHHS Priority	Water Supply System	Issue being addressed by TasWater in PSP1 and/or PSP2?	PSP Project No.
1	Avoca	Yes (2015/16)	872
1	Branxholm	Yes (2013/14)	281
1	Currie	Yes (2013/14)	699
1	Derby	Yes (2013/14)	281
1	Ellendale	Yes (2013/14)	272
1	Fingal	Yes (2013/14)	282
1	Mole Creek	Yes (2013/14 - 2015/16)	283
1	Pioneer	Yes (2013/14 - 2014/15)	597
1	Ringarooma	Yes (2013/14 - 2015/16)	590
1	Rosebery	Yes (2013/14 - 2015/16)	488, 625
1	Westbury/Hagley	Yes (2013/14)	284
1	Whitemark	Yes (2014/15)	
2	Colebrook	Yes (2013/14)	160
2	Cygnets - Nichols Rivulet	Yes (2014/15)	Huon Valley regional water scheme ¹⁴
2	Franklin - Jackson's Road	Yes (2014/15)	Huon Valley regional water scheme ¹⁴
2	Geeveston - Kermantie	Yes (2014/15)	Huon Valley regional water scheme ¹⁴
2	Gormanston	No (2018/19)	900
2	Gretna	No (2013/14 - 2014/15)	4
2	Hamilton	Yes (2013/14)	12
2	Ranelagh - Rocky Creek	No (2018/19)	901
2	Lady Barron	Yes (2014/15)	802
2	Mountain River	Yes (2014/15) ¹⁵	
2	Ouse	Yes (2013/14)	12
2	Scamander	Yes (2013/14)	865
3	Conara	No (Post 2024/25)	669
3	Cornwall	No (Post 2024/25)	671
3	Gladstone	No (Post 2024/25)	670
3	Herrick	No (Post 2024/25)	871
3	Judbury	No (No projects listed)	161
3	Lake Barrington (Sheffield/Railton)	Yes (2013/14)	692
3	Legerwood	Yes (2013/14 - 2015/16)	590
3	Mathinna	No (Post 2024/25)	672
3	Rossarden	No (Post 2024/25)	673
3	Tunbridge	Yes (2013/14)	7
3	Wayatinah	Yes (2013/14)	21
3	Winnaleah	No (Post 2024/25)	868

¹² Source: 'Doc 59 - DHHS priority list for TasWater'¹³ Source: 'B14 160738 Capital Works Program PSP Version'¹⁴ Source: TasWater response to [Jacobs] PSP2 Expenditure Review Draft Report (27 November 2014); these systems will be connected to the Huon Valley regional water scheme in FY2014/15¹⁵ Source: TasWater response to [Jacobs] PSP2 Expenditure Review Draft Report (27 November 2014); the Mountain River Service Replacement Project is currently underway

2.3.3 TasWater's long term expenditure planning

TasWater demonstrates a commitment to developing its long term capital planning processes and investment profile – including renewals, growth, compliance and improvement drivers. In particular TasWater has identified within its asset management improvement activities the need for sequencing/augmentation plans and robust asset renewals plans (starting with risk-based proactive renewals strategies for its linear network assets).

Finding: Jacobs endorses the development of these activities, noting its current challenges with determining out-of-sequence charges and TasWater's under-investment in water and sewer pipeline renewals (with its asset sustainability ratios expected to stay below one (1) until at least FY2021). Developing risk-based renewals strategies will help ensure expenditure on condition assessments, maintenance and renewals is targeted, thereby improving the sustainability of network assets in a cost-effective manner.

TasWater's current Capital Works Program spreadsheet does include projects scheduled for FY2025 and 'beyond', but is otherwise effectively contained in the three 30-year Asset Management Plans of TasWater's legacy regional organisations. In addition TasWater is progressing its major wastewater strategies for Launceston and Hobart.

3. Capital Expenditure Review

3.1 Review Approach

This component of the Jacobs review was conducted using three approaches:

- An assessment of the prudence and efficiency of a sample of 20 major capital projects/programs – including a projects proposed by TasWater for PSP2 and current or historical projects delivered by TasWater or its legacy regional organisations during PSP1.
- An assessment of the reasonableness of TasWater’s capital expenditure program as a whole, within the context of its long-term plans and the assumptions underlying them, including the scale, scope and planning of the entire capital expenditure program.
- An assessment of TasWater’s asset and capital expenditure classifications provided in its PSP2 submission

An evidence based review was employed – conducted through a review of: TasWater project/program business cases and supporting documentation (NPV analysis, investigation reports, etc.); its corporate documentation relating to the CAPEX program (capital works program list, system/catchment risk assessments informing the currently draft DWQMP and WWMP¹⁶, etc.); TasWater’s draft PSP2 submission; and through a number of RFIs and discussions with relevant TasWater personnel.

This component of the review serves to assist the Regulator in determining how much capital expenditure to be incurred by TasWater in the second regulatory period (PSP2) should be included into TasWater’s Regulatory Asset Base (RAB).

Regulatory capital expenditure reviews should result in Jacobs recommending a revised capital expenditure profile for the utility’s upcoming regulatory period. Jacobs may recommend that expenditure proposed by the utility be deferred (where found not to be prudent); or not be included in the RAB (e.g. where not efficient or where expenditure relates to unregulated services). Conversely, Jacobs may recommend that delayed expenditure, originally scheduled to be incurred during the current regulatory period (i.e. PSP1), be considered in the upcoming expenditure period for the pricing determination. This would occur for each sample project reviewed as well as the capital expenditure program as a whole.

However given the circumstances of this review - the limited information which Jacobs has received in response to a number of its RFIs, as well as TasWater’s need to undertake works to address pressing compliance issues without the extent of business case rigour that Jacobs would normally expect – Jacobs cannot make robust quantitative adjustment recommendations in relation to the proposed capital expenditure in this report.

3.2 TasWater’s Overall Capital Expenditure Program Review

3.2.1 TasWater’s drivers for CAPEX

As noted in TasWater’s draft PSP2 submission, compliance will continue to be its top capital expenditure priority for PSP2 given “a significant proportion of TasWater’s infrastructure is ageing and/or in poor condition and its performance is non-compliant, resulting in public health and environmental outcomes that do not meet contemporary standards”. Around 53% of TasWater’s regulated PSP2 expenditure is proposed for compliance works. The balance of TasWater’s PSP2 expenditure in decreasing magnitude is Improvement (18%), Renewals (16%) and Growth (13%). This is highlighted in **Figure 4**, which is sourced from Attachment K of the draft PSP2 submission and adjusted to real dollars.

¹⁶ The DWQMP and WWMP are currently being developed, with draft versions of these two plans expected to be submitted to the industry regulators (DHHS and EPA respectively) in December 2014. Jacobs sighted working draft versions of the plans and interrogated the system/catchment risk assessment spreadsheets that strongly inform the content of the plans.

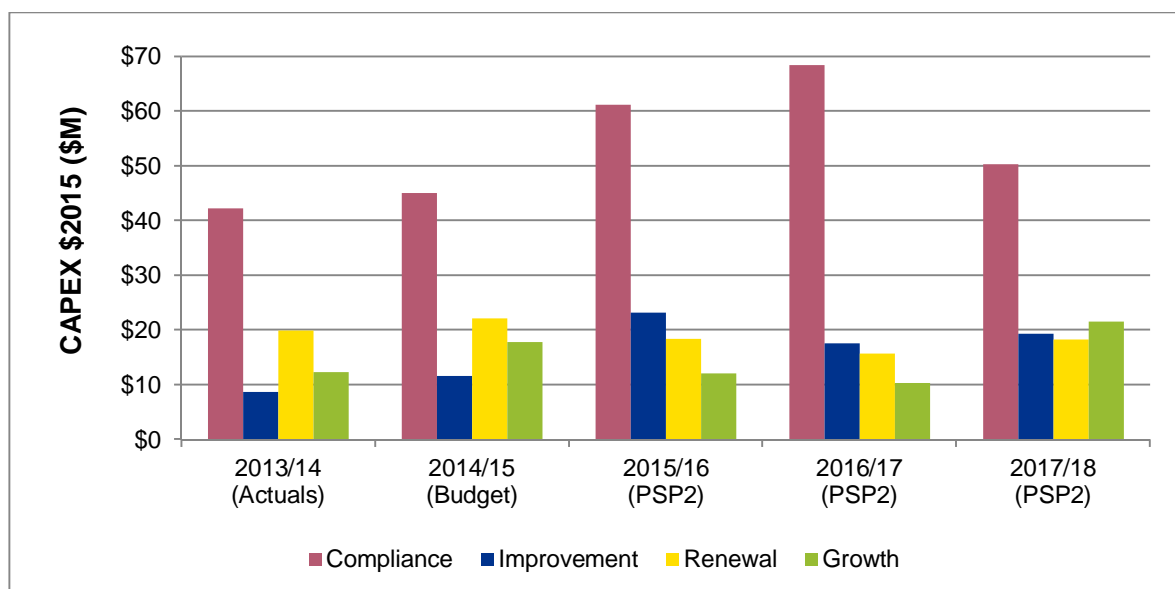


Figure 4 – TasWater’s regulated expenditure by Ring Fencing cost driver (\$2015)¹⁷

It is important to note that, at present, TasWater only allocate a project’s capital expenditure to its primary cost driver. Most of the sample projects reviewed include elements of multiple cost drivers (e.g. constructing a new WTP that addresses a compliance issue and accommodates 30 year growth/capacity). As such, the values in the above table may not reflect the benefits realised across all four cost drivers.

3.2.2 TasWater’s proposed CAPEX for PSP2

Finding: Jacobs finds that there is a poorly defined relationship between the list of capital projects included for PSP2 within TasWater’s Capital Works Program spreadsheet and the proposed capital expenditure levels presented by TasWater in its draft PSP2 submission. This has been discussed with and acknowledged by TasWater – who indicate that the proposed \$330M_{nominal} expenditure was determined through an assessment of TasWater’s delivery capacity and its financial constraints.

An oversubscription of projects (currently \$494M_{nominal}) in its Capital Works Program is being employed by TasWater as a significant number of its capital projects with proposed expenditure in PSP2 do not yet have approved business cases. TasWater’s expectation is that the \$494M_{nominal} will converge to \$330M_{nominal} through PSP2. Some projects currently being scoped may be found to be less urgent and thus deferred, or scoping activities may find more cost effective solutions. And should TasWater be approaching its \$110M_{nominal} target/limit per year, it will ‘throttle back’ its delivery program by deferring lower priority projects or may possibly seek alternative sources of funding.

Jacobs acknowledges TasWater’s challenge of needing to submit a robust (prudent and efficient) capital expenditure program for PSP2 at this stage of its maturity, but the Regulator has not been presented with an expenditure program that is able to demonstrate prudence and efficiency at a program level.

TasWater’s current draft PSP2 submission can create uncertainty for TasWater’s stakeholders, including the Regulator and other industry regulators, who are not able to clearly identify the quantum of outcomes they can expect over the PSP2 regulatory period.

Through this review, Jacobs is confident that TasWater will continue to seek greater certainty in its capital works program over the months and years ahead – and has noted TasWater’s commitment for regular (quarterly) communication with the regulators to ensure that there is appropriate awareness of, and input to, the evolving capital program.

¹⁷ Data Source: Attachment K of the TasWater draft PSP2 submission (CAPEX worksheet)

Differences between TasWater's draft PSP2 submission and its Capital Works Program Spreadsheet

In reviewing TasWater's CAPEX profile over the 2013/14 – 2017/18 financial years, Jacobs has observed two different sets of capital expenditure values being used by TasWater within its key documents – namely:

- TasWater's Draft PSP2 submission, which proposes \$330M_{nominal} over PSP2 (\$110M_{nominal} per year)
- TasWater's Capital Works Program Spreadsheet (its master list of capital projects and programs), which proposed \$467M_{nominal} over PSP2 at the time of the draft PSP2 submission (and currently proposes \$494M_{nominal} over PSP2).¹⁸

The annual differences between the two sets of documents at the time of the draft PSP2 submission are summarised in **Figure 5** (shown in real \$2015).

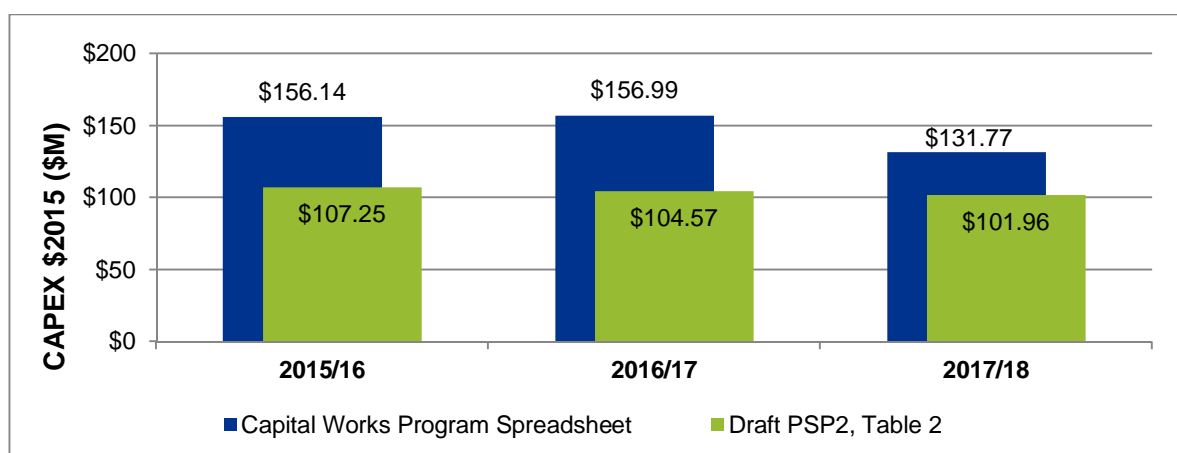


Figure 5 –CAPEX differences across TasWater's Draft PSP2 and its Capital Works Program Spreadsheet (\$2015)

Jacobs finds that there is a poorly defined relationship between these two lists of capital projects.

At the time of its draft PSP2 submission, TasWater had 638 projects/programs listed within its Capital Works Program spreadsheet, of which 297 had expenditure proposed for PSP2, totalling the \$467M_{nominal} over the 3-year regulatory period (of which Jacobs estimates approximately \$120M_{nominal} is contingency allowances given the 'gate' status of the projects at the time of the draft PSP2 submission)¹⁹. Its Capital Works Program is prioritised, but TasWater has elected to not nominate its 'top \$110M' to be spent per year during PSP2. This has been discussed with and acknowledged by TasWater – who indicates that:

- The proposed \$110M_{nominal} capital expenditure per year value was determined through an assessment of TasWater's delivery capacity and its financial constraints²⁰
- TasWater's draft PSP2 submission represents its 'best estimate' capital expenditure proposal at the time of the submission given many projects do not (did not) have approved business cases (i.e. Gate 2 approval within TasWater's project management framework) due to the relative infancy of TasWater and its capital planning and prioritisation process

This is presented in **Figure 6**, which is a TasWater schematic with additional notes by Jacobs.

¹⁸ Data Source: TasWater have provided two versions of its Capital Works Program spreadsheet to Jacobs. One version (*B14 160738 Capital Works Program PSP Version*) was used by TasWater to inform its Draft PSP2 submission and is understood to contain values current at May 2014. It was provided to Jacobs on 22 October 2014. An updated current version (*Capital Works Program Master - Version 0.1*) was provided to Jacobs on 27 November 2014.

¹⁹ At the time of this Final Report, TasWater has 647 projects/programs listed within its Capital Works Program spreadsheet, of which 285 have expenditure proposed for PSP2, totalling \$494M (nominal) over the 3-year regulatory period (of which Jacobs estimates approximately \$102M is contingency allowances given the 'gate' status of the projects at the time of the draft PSP2 submission).

²⁰ Review of TasWater's financial constraints falls outside of the terms of reference of this review.

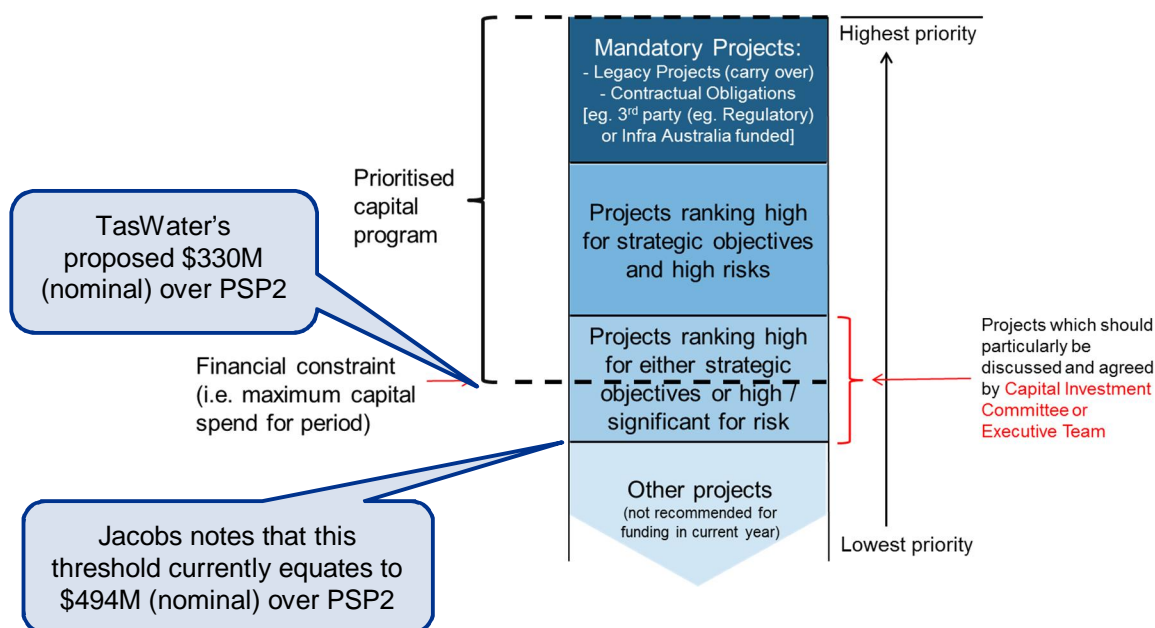


Figure 6 –TasWater’s schematic demonstrating it’s ‘subtractive’ approach to develop the prioritised capital program²¹

As such, the mechanism by which TasWater linked the proposed ‘target’ of \$330M_{nominal} M to the \$467M_{nominal} in the Capital Works Program spreadsheet (at the time of the draft PSP2 submission) was through a proportional adjustment of the costs for each combination of service, cost driver and year - as shown in **Table 5**, which uses nominal dollars for clarity relating to the \$110M_{nominal} per year.

Table 5 – Proportional adjustment of the Capital Works Program into the proposed PSP2 capital expenditure (\$M, nominal)²²

	Capital Works Program			Adjusted for PSP2		
	2015/16	2016/17	2017/18	2015/16	2016/17	2017/18
Water	\$60.8	\$64.6	\$52.1	\$41.8	\$43.1	\$40.3
Growth	\$5.0	\$3.4	\$15.9	\$3.4	\$2.2	\$12.3
Renewal	\$8.1	\$5.0	\$7.6	\$5.6	\$3.3	\$5.8
Compliance	\$37.3	\$47.1	\$19.6	\$25.6	\$31.4	\$15.1
Improvement	\$10.4	\$9.3	\$9.2	\$7.1	\$6.2	\$7.1
Wastewater	\$77.7	\$81.9	\$71.6	\$53.4	\$54.5	\$55.4
Growth	\$1.9	\$1.2	\$4.4	\$1.3	\$0.8	\$3.4
Renewal	\$10.8	\$11.5	\$11.0	\$7.4	\$7.6	\$8.5
Compliance	\$59.6	\$62.7	\$47.7	\$40.9	\$41.8	\$36.9
Improvement	\$5.4	\$6.5	\$8.6	\$3.7	\$4.3	\$6.7
Non-infrastructure CAPEX	\$21.6	\$18.6	\$18.4	\$14.9	\$12.4	\$14.2
Annual Total	\$160.1M	\$165.1M	\$142.2M	\$110M	\$110M	\$110M

Where for each cell: $Value_{adjusted} = Value_{original} \times \frac{\$110M}{Annual\ Total}$

²¹ Source: TasWater presentation to Jacobs 18/08/2014

²² Data Source: TasWater B14 160738 Capital Works Program PSP Version (Pivot Table worksheet)

Uncommitted expenditure and oversubscription of projects

TasWater are consciously employing an oversubscription of projects in its Capital Works Program as a significant number of its capital projects with proposed expenditure in PSP2 do not yet have approved business cases.

To illustrate the point, through analysis of TasWater’s current Capital Works Program spreadsheet²³, there are presently 147 projects (out of 192 projects) with expenditure proposed for the first year of PSP2 (FY15/16) that do not yet have an approved business case. Their proposed expenditure for FY15/16 equates to \$77.3M, which represents 45.9% of the \$168.3M in the Capital Works Program spreadsheet for FY15/16.

Of course, this also signifies that there is \$91.0M of capital expenditure approved for the first year of PSP2 (FY15/16). This includes 45 projects (\$55.4M) that do have approved business cases, as well as 24 capital expenditure programs (\$35.6M)²⁴. If we consider this in the context of TasWater’s target \$107.3M (i.e. \$110M_{nominal}) capital expenditure target for FY15/16, then TasWater have 84.8% of their target expenditure approved.

It should be noted though, that of the \$91.0M of capital expenditure approved for the first year of PSP2, only \$47.9M is considered by Jacobs to be committed expenditure – composed of 19 projects (representing \$12.3M) that have contracts awarded (i.e. are currently at Gates 4-6) and the \$35.6M of program expenditure. TasWater currently have 29 projects (worth \$43.1M in FY15/16 and \$122.6M over PSP2) that have business cases approved but have not yet had contracts awarded (i.e. are currently at Gates 2-3).

The current gate status of TasWater’s capital expenditure profile for PSP2 is summarised in **Figure 7**, which has been overlaid with TasWater’s annual target expenditure proposed in its draft PSP2 submission.

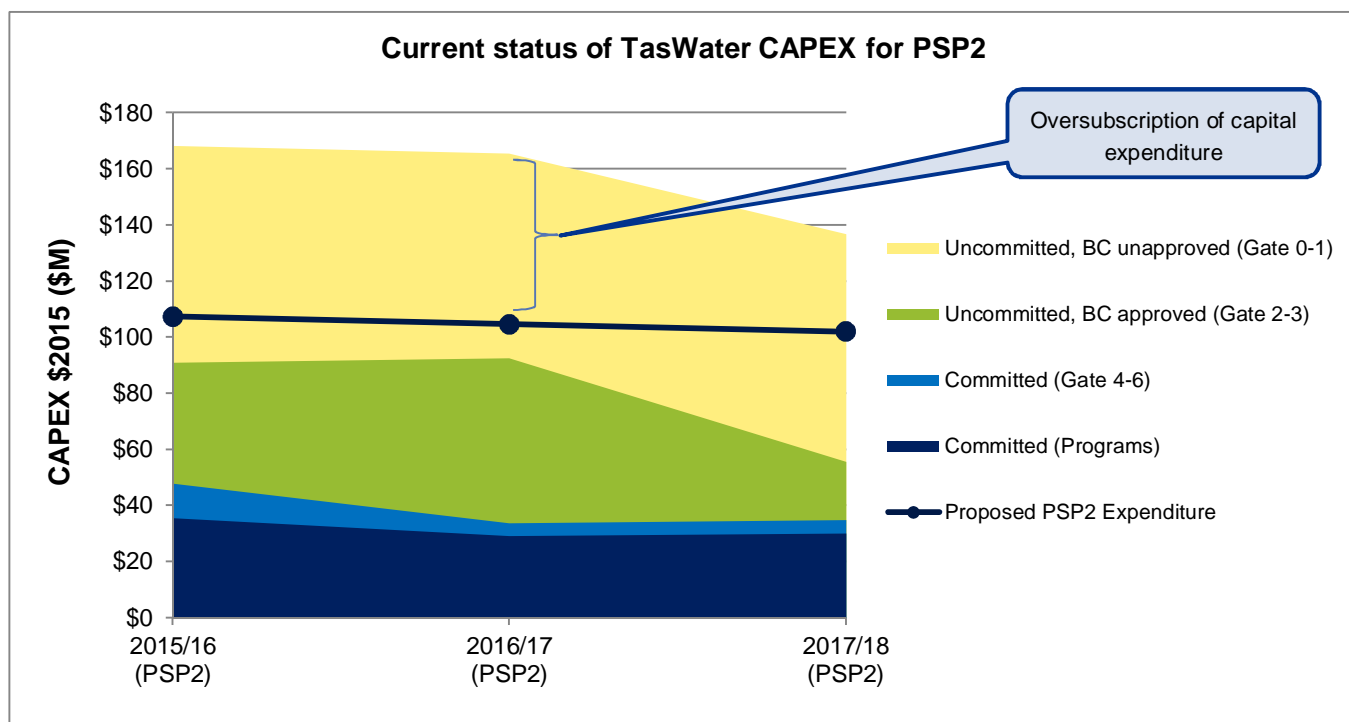


Figure 7 – Current gate status of TasWater’s proposed CAPEX for PSP2 - showing the oversubscription of expenditure²⁵

²³ Data Source: TasWater Capital Works Program Master - Version 0.1, current at 27 November 2014.

²⁴ Capital Programs employ Program Definition Forms in TasWater’s Project Management Framework

²⁵ Data Source: TasWater Capital Works Program Master - Version 0.1, current at 27 November 2014

TasWater's Capital Works Program spreadsheet indicates that it is expecting to have a further 30 business cases (representing \$30.7M of expenditure in FY15/16 and \$93.9M over PSP2) that will be approved in the remainder of FY14/15. Jacobs also notes the changes made to TasWater's delegation levels within its Capital Projects Governance Framework (updated 25 June 2015), allowing low risk projects up to \$2.5M to be approved by the CEO (rather than the Board).

Jacobs appreciates that TasWater is progressing a large number of projects through its capital planning and prioritisation process in its efforts to ramp up its capital delivery program to the target \$110M per year for PSP2; but notes through review of the sample projects that many of TasWater's business cases need substantial improvements (see **Section 3.3.3** for further discussion and recommendations).

Acknowledging that there is an oversubscription of projects, TasWater's expectation is that the \$494M currently in the Capital Works Program will converge to \$330M as projects progress through their approval gates. Some projects still in the strategic planning and assessment phase (Gate 0) and the project scoping phase (Gate 1) may subsequently be found to be less urgent and thus deferred, or scoping activities may find more cost effective solutions. And should TasWater be approaching its \$110M target/limit per year, it will 'throttle back' its delivery program and defer lower priority projects or find alternative sources of funding.

TasWater appear comfortable to work with this level of ambiguity given it has a large program of capital works that it will need to deliver over the coming several regulatory periods. Jacobs is confident that TasWater's AOSC and its Asset Strategy, Planning and Performance Division will continue to seek greater certainty in its capital works program over the months and years ahead, but understandably TasWater's current draft PSP2 submission can create uncertainty for TasWater's stakeholders, including the Economic Regulator and other industry regulators, who are not able to clearly identify the quantum of outcomes they can expect over the PSP2 regulatory period.

The Economic Regulator in particular has not been presented with an expenditure program that is able to demonstrate prudence and efficiency at a program level – due to ambiguity around the projects that will be delivered in PSP2 and the risk associated with cost estimates for projects that are still in strategic planning and scoping phases. This is particularly relevant given TasWater's use of standards contingency rates – where currently all projects are allocated a standard contingency allowance at each gate (Gates 0-2 = 30%, Gate 20% and 10% respectively)²⁶.

Jacobs acknowledges TasWater's challenge of needing to submit a robust (prudent and efficient) capital expenditure program for PSP2 at this stage of its maturity and notes that the highest priority projects and projects with already committed expenditure (e.g. awarded contracts) will have a high degree of certainty in delivery. TasWater has also indicated that it is committed to quarterly communications with its industry regulators to ensure that there is appropriate awareness of, and input to, the evolving capital program. Jacobs endorses this regular communication.

Jacobs appreciates that the level of capital expenditure and the projects undertaken are more likely to be determined by price constraints for PSP2, but given cost and asset values will become increasingly important for future regulatory submissions, TasWater's future regulatory submissions will need to significantly improve their justification of proposed levels of capital expenditure, as would be expected from a mature water utility.

Recommendation: Jacobs recommends that TasWater should more clearly articulate in its final PSP2 submission: its committed and uncommitted expenditure; how it proposes to manage and communicate the delivery of its oversubscribed Capital Works Program as it approaches and progresses through PSP2.

Recommendation: Jacobs recommends that TasWater incorporate risk-based costing into its business cases and capital planning and prioritisation process so that the different levels of uncertainty around project costs at different gates can be explicitly presented (P50, P90, etc.). Otherwise, using the standard 30% contingency

²⁶ Within TasWater's Project Management Framework: GATE 0 - Strategic Planning and Assessment; GATE 1 - Project scope; GATE 2 - Business Case; GATE 3 - Project Plan; and GATE 4 - Award contract

allowance²⁷ on all business cases, over a range of projects and without consideration of the delivery risks of the project type (e.g. pipeline replacement versus STP process upgrades), TasWater will likely have an inflated capex program estimation. Melbourne Water's risk adjusted nominal estimate (RANE) process is an example of good industry practice.

3.2.3 Forecast vs Actual Capital Expenditure for PSP1

The capital program of TasWater and its legacy regional organisations during the PSP1 period (2012/13 to 2014/15) has been analysed to assist in providing recommendations for PSP2 regulatory period. The actual historical capital expenditure over FY2013 and FY2014, as well as the expected TasWater expenditure for FY2015, are shown in **Table 6** and **Figure 8**. All values are in nominal dollars.

The CAPEX budgets were established by the legacy regional organisations through their PSP1 submissions, who delivered FY2013 before the commencement of TasWater's operations in FY2014.

Table 6 – Historical CAPEX - Forecast vs. Actual/Expected expenditure (\$M, nominal)²⁸

Utility	PSP1		
	2012/13 (Actuals)	2013/14 (Actuals)	2014/15 (Expected)
CAPEX Forecast	\$114.8	\$108.6	\$109.5
Cradle Mountain Water (PSP1)	\$20.7	\$18.4	\$18.1
Ben Lomond Water (PSP1)	\$35.2	\$30.1	\$31.4
Southern Water (PSP1)	\$58.8	\$60.0	\$60.0
TasWater	\$0.0	\$0.0	\$0.0
CAPEX Actual / Expected	\$101.0	\$77.8	\$90.0
BLW + CMW + SW	\$101.0	-	-
TasWater	-	\$77.8	\$90.0
Variance	-\$13.8	-\$30.8	-\$19.5
	-12.0%	-28.3%	-17.8%

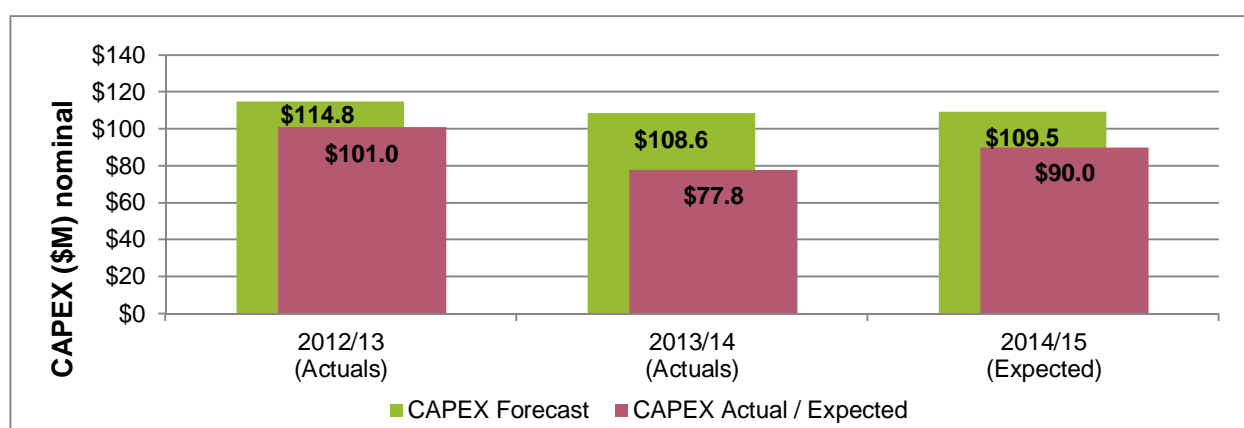


Figure 8 – Historical CAPEX - Forecast vs. Actual/Expected expenditure (\$M, nominal)²⁸

²⁷ Gate 2 within TasWater's Project Management Framework

²⁸ Data Sources:

2012/13 forecasts from the PSP1 submission from BLW, SMW and SW (FY2014 and FY2015 also in TasWater Annual Performance Report 2013/14)

2012/13 actuals from the Tasmanian Water And Sewerage State Of The Industry Report 2012-13 (estimated aggregate only available)

2013/14 and 2014/15 forecasts and actuals from the TasWater Annual Performance Report 2013/14

TasWater acknowledges its underspend for FY2014, expected underspend for FY2015 and the underspend of its legacy regional corporations in prior years. Substantial commentary on this has been provided in the *TasWater Annual Performance Report 2013/14* (prepared October 2014), and TasWater note that these “are being used to inform and refine TasWater’s capital works planning and delivery processes going forward. The primary factors are:

- Assumptions made in the preparation of the first PSP were overly optimistic in terms of project timelines, particularly in regard to the time needed to obtain approvals and complete designs. TasWater is now significantly better informed about the time required to obtain approvals and deliver projects which are “shovel ready” and this is factored into the capital works planning process.
- The move to a state-wide operating model involved a review of the status, priorities and effectiveness of proposed solutions for all major capital projects. A consequence of this was a temporary reduction in the level of capital expenditure for part of the year.
- A conclusion from the capital program review was the need for a new state-wide delivery model capable of realising a nominal \$100 million spend on a consistent and sustainable basis. This has resulted in a significant change in the way resources are allocated and projects delivered. This change in delivery methodology has also contributed to the lower than budgeted capital spend.”

TasWater’s response to Jacobs’ draft review report provided further commentary on recent developments that support the successful delivery of its capital program going forward:²⁹

1. “A number of large scale projects are now moving into the delivery phase and many of them will be completed and commissioned during the PSP2 period
2. The Works Engine Group [led by the General Managers of the Asset Management, Works Delivery and Operations and Maintenance Divisions] has been able to accelerate a number of these large scale projects with many tenders going to market before Christmas
3. Capability and capacity building has significantly improved over the past six months with many new employees adding value to the broader team
4. Further recruitment is underway to boost the capacity and set the delivery pipeline on a sound path
5. In-principle agreement with regulatory agencies to minimise project approvals timelines is being progressed.“

Jacobs recognises TasWater’s efforts to ramp up the delivery of its capital expenditure program but, within the timeframe of this review, has not sighted TasWater expected numbers and values of projects expected to move into delivery phase in the remainder of this financial year. Given the review of the sample projects (see **Section 3.3**) and in particular the delays being experienced with approvals, Jacobs must remain of the opinion that that TasWater will be unable to deliver the proposed \$110M_{nominal} capital expenditure for FY2016, but that TasWater should be able to deliver the \$110M/yr. nominal for in future years, FY2017 and FY2018. See **Section 3.3.3** for further discussion.

3.3 Prudency and Efficiency review of sample projects/programs

Jacobs has undertaken a review of 20 capital projects (or programs of works) to assess the prudency and efficiency of the associated capital expenditure. The sample projects/programs are listed in **Table 8**.

Of these projects, 13 have expenditure proposed in the PSP2 regulatory period (6 projects were reviews of historical projects from TasWater’s legacy regional organisations and ‘Project 9’ was a review of the Small Towns Water Supply Strategy, which does not nominate specific expenditure). The 13 projects represent a total of \$125.2M (nominal) expected expenditure in PSP2, or 38% of the proposed \$330M capital expenditure. All 13 projects have a business case.

²⁹ TasWater response to PSP2 Expenditure Review Draft Report (Ref: 14/74827, 27 November 2014)

3.3.1 Selection of the sample projects

Programs and projects were selected employing the following criteria:

- Each project/program comprises a significant proportion of the total capital expenditure (each with an actual or forecast cost of \$3 million or more).
- The sample set includes projects/programs from each of the four cost driver categories specified in the *May 2013 Water And Sewerage Accounting Ring Fencing Guideline* – i.e. compliance, renewals, improvements and growth. A larger percentage of projects will have a compliance driver given the strong compliance focus of TasWater for PSP2.
- The sample set includes a split of projects/programs from PSP1 and PSP2, where:
 - Half are projects proposed by TasWater for the second regulatory period
 - Half are historical (completed) and budgeted (underway) projects from the current regulatory period – including projects from TasWater, Ben Lomond Water, Southern Water and Cradle Mountain Water.
- The sample set includes a mix of water projects and wastewater projects
- The sample set includes a mix of network projects and facility projects




Jacobs selected 14 of the projects and provided TasWater the opportunity to nominate 6 projects for inclusion in the review (which Jacobs tested to ensure the total set met the above criteria). TasWater nominated the following projects that were included in the final list: Project 9 (the Small Towns Water Supply Strategy), Project 10 (King Island), Project 13 (Burnie Lion), Project 14 (Bridport), Project 18 (Rosebery), Project 19 (Taroona).

3.3.2 Prudency and Efficiency requirements of the sample projects

Jacobs reviewed each sample project/program to the Regulator's 'prudency test' and 'efficiency test' definitions, which are provided in **Appendix A** and require Jacobs to take into consideration "the circumstances facing the relevant regulated entity at the time the decision was made...".

The approach to assessment of prudency and efficiency should be separate and a prescriptive one. That is in a "traffic light" assessment there would only be "green" (prudent/efficient) or "red" (not prudent/inefficient). However it seems appropriate given the current circumstances that TasWater finds itself in as a newly created organisation with many challenges that a third option might be appropriate for its programs of work included in this PSP2 review (on a once-off basis) to summarise Jacobs views on prudency and efficiency. The prudency / efficiency outcomes possible for each project are summarised in **Table 7**.

Table 7 – Prudency and Efficiency possible outcomes for sample project/program reviews

Symbol	Prudency / Efficiency outcome
	The project/program expenditure is prudent / efficient
	The project/program expenditure is not prudent / efficient
	For programs of work, where the program is prudent/efficient but specific projects/activities within the program are not prudent/efficient.

For this review - appreciating that TasWater's systems require significant investment over the next decade to ensure they meet contemporary health and environmental compliance requirements – Jacobs has assumed that, for projects with a demonstrated need, information within a business case is valid if there insufficient supporting evidence but its assumptions have been separately and indirectly tested through discussions and RFIs with TasWater personnel. Namely that to the extent that information has not been provided by TasWater and without direct evidence or other information arising out of this expenditure assessment or any specific Jacobs views to the contrary, the approach, expenditure and timing proposed by TasWater has been adopted.

The three particular challenges that might justify this are:

- TasWater's desire, need and obligation to undertake works to address pressing shortcomings without the extent of rigour that would normally be expected including the development of well-constructed and robust strategies driving the works (i.e. the challenge of addressing "hot issues" versus the longer term business and regulatory need to develop robust strategies to drive expenditure) and the balance between concurrently developing robust strategies; and
- TasWater's challenge to concurrently satisfy competing needs in a tight timeframe for this expenditure and price review of continuing to efficiently drive ongoing business activities while meeting the requirements of the Regulator and Jacobs; and
- The apparent lack of extensive detailed and sufficiently robust business information at this stage of TasWater's development (but which will be addressed over time and before the next regulatory period).

This is also supported by Jacobs overall view that, given the evident mountain of challenges facing TasWater and notwithstanding shortcomings in rigorously addressing prudence and efficiency assessments, for PSP2 the projects are generally prudent (i.e. should be pursued) and efficient (when sufficient rigour has been applied).

Recommendation: For the next regulatory period a more rigorous approach would need to be adopted for such an independent expenditure review as part of the price setting process (e.g. through a revision of the prudence test and efficiency test definitions), and indeed by TasWater itself.

In future reviews this would not or should not occur. Indeed the reverse position should be adopted by an independent expenditure reviewer, namely that without adequate supporting robust information to support the proposed solution, expenditure and timing some adjustment should be made as a matter of course. If only on the basis of probabilities that with so much uncertainty the capex expenditure will inevitably be less than the "optimistic" forecasts.

3.3.3 Outcomes of the detailed review of the sample projects/programs

The prudence and efficiency findings for the sample projects/programs are listed in **Table 8** and the assessment of each sample project/program can be found in **Appendix B**. For each project an overview of the project is provided which includes evidence to support the decision making, followed by an assessment of the prudence and efficiency of each project and any further discussion and recommendations on the appropriateness of expenditure to address key drivers and obligations; the robustness of the business case; the reasonableness of cost estimates and the deliverability of the project/program.

Table 8 – Summary of the prudence and efficiency findings of the sample projects/programs

No.	Utility	Service	Project/Program Description	Prudent	Efficient
Proposed Projects - FY15/16 to FY17/18					
1	TasWater	Water	Tolosa Dam decommissioning	●	●
2	TasWater	Water	Fingal WTP construction	●	●
3	TasWater	Water	Flinders Island (Whitemark & Lady Barron WTPs)	●	●
4	TasWater	Water	Ringarooma, Ledgerwood, Derby, Branxholm TW	●	●
5	TasWater	Wastewater	Sewer Mains Renewals and CCTV programs	●	●
6	TasWater	Wastewater	Brighton STP rationalisation	●	●
7	TasWater	Wastewater	Kingborough sewerage strategy	●	●
8	TasWater	Wastewater	Ti Tree Bend WWTP upgrade	●	●
9	TasWater	Water	Small Towns Water Supply Strategy	● ●	●
10	TasWater	Water	King Island Water Infrastructure Upgrade Program	●	●
Budgeted Projects - FY14/15					
11	TasWater	Wastewater	STP Inlet Works Program (Southern Region)	● ●	●
12	TasWater	Water	Ouse & Hamilton Water Supply Upgrade	●	●
13	TasWater	Wastewater	Burnie Lion Trade Waste upgrades	●	●
14	TasWater	Wastewater	Bridport STP upgrade and re-use scheme	●	●
Historical Projects - FY12/13 and FY13/14					
15	BLW	Water	Ben Lomond Water's meter installation project	●	●
16	BLW	Water	Westbury WTP, reservoir and pipeline construction	●	●
17	CMW	Wastewater	Wynyard WWTP upgrades and renewals	●	●
18	CMW	Wastewater	Rosebery WWTP and pipeline construction	●	●
19	SW	Wastewater	Taroona Pump Station & Pressure Main	●	●
20	SW	Wastewater	Berriedale to Elwick Pipeline Duplication	●	●

Summary of findings on Prudence

As can be seen from **Table 8**, most projects/programs are prudent, which is consistent with TasWater's need to address a large number of compliance issues in its water and wastewater systems. Projects/programs are appropriate in relation to TasWater's key drivers and obligations, including obligations imposed by industry regulators or customer service expectations.

There are also some examples where a staged approach has been considered (e.g. the Burnie Lion Trade Waste Project).

However, it was found for two programs of work (the Small Towns Water Supply Strategy and the STP Inlet Works Program), that while the programs are prudent on a needs basis, specific projects/expenditure within the program are not prudent. This generally relates to the lowest priority projects that have been included in the programs as a result of the lack of robustness (or lack of supporting evidence demonstrating robustness) of the decision making process to set the threshold for projects that 'make the cut'.

Summary of findings of Efficiency – Business cases need substantial improvements

Most projects are not efficient in Jacobs' opinion. Business cases by predecessor organisations are inadequately robust and some business cases now still appear to be rapidly progressed but without the necessary rigour to justify expenditure.

For example, for Flinders Island, the business case refers to a 'detailed report and analysis of options prepared for this business case' but the Options Assessment Report prepared by TasWater is still in draft format with many sections incomplete, including the Options Assessment and Recommendation sections. The cost estimates provided in the NPV analysis also includes new infrastructure for raw water sources – including dam works, pump stations and raw water tanks which have not been discussed in any detail in the business case.

Recommendation: Jacobs makes the following general recommendations for TasWater to consider for future business cases (and PSP submissions):

- Business cases should be based on detailed options assessments and feasibility assessments. It is recognised that in some cases, business cases will be based on draft reports and studies. However these studies should be finalised prior to submitting business cases, and any updated information should be reflected in a revised scope and cost estimate
- All business cases should include justification for all components of the project. For example, for the Flinders Island Project, the only rationale provided was in regards to water quality. More emphasis is needed on providing evidence for the works/facilities driven by renewal and growth needs
- The costs captured in the business cases should be based on more detailed scoping of the preferred option. For treatment projects, this should include sufficient detail about the type of technology applied
- Cost estimates should consider opportunities for economies of scale savings. This is particularly important when comparing options of varying scale
- Business cases need to enunciate the service outcomes proposed by the works and clearly set out the options investigations and the approach taken to select the preferred option (MCA, least-cost NPC, etc.), including sensitivity testing. For example, for Bridport STP re-use scheme, there is insufficient rigour to support the selection of the preferred option. While it has the best NPV, it is only 1.5% better than the second place option and 4% better than the third place option; and has capital expenditure approximately \$1.5M higher than these other options due to the need for a larger land acquisition and construction of a longer pipeline (it has the best NPV due to the anticipated revenue stream from the thinning and harvesting of the pine trees in 2020 and 2036). Very limited evidence of sensitivity testing was performed and the qualitative options assessment discussion in the business case does not highlight any non-cost factors that materially justify the selection of preferred option over the nearby second and third placed options.

Projects – does expenditure represent reasonable cost estimates?

Where sufficient rigour has been applied Jacobs find that TasWater's cost estimates are reasonable and well supported, usually through a combination of schedules of quantities using typical rates and market testing of costs – for example the STP Inlet Screens Program.

TasWater should improve its contingency allocation approach – where currently all projects are allocated a standard contingency allowance at each gate (Gates 0-2 = 30%, Gate 20% and 10% respectively). As discussed in **Section 3.2.2**, Jacobs recommends that TasWater incorporate risk-based costing into its capital planning and prioritisation process, which should have consideration of the delivery risks of the project type (e.g. pipeline replacement versus STP process upgrades).

Projects have commonly been delayed due to approvals

Review of the sample projects has demonstrated that TasWater and its legacy regional organisations have regularly been delayed by months or years (e.g. Bridport STP) due to unexpected delays associated with

approvals, land purchases and contract procurement and negotiations. As mentioned in **Section 3.2.3**, TasWater has acknowledged this issue in its *Annual Performance Report 2013/14* - but Jacobs note that some current business cases continue to include seemingly ambitious durations for approvals and procurement activities - for example the Kingborough Sewerage System Strategy's timeframe between the detailed design being completed (July 2015) and the tendering and contract awarded (November 2015).

3.4 Overall recommended adjustment to capital program

Acknowledging the basis on which TasWater established its \$110M/yr. nominal expenditure proposal for PSP2, Jacobs finds that:

- TasWater has a clear and demonstrated need for its proposed level of capital expenditure
- It is Jacobs' opinion that TasWater will be unlikely to deliver \$110M nominal in FY2016 given the current status of its proposed projects (only \$43.1M is considered by Jacobs to be committed expenditure), the delays experienced with approvals on the sample projects reviewed, and its under-delivery of capital projects in the past 2 years (-28.3% during FY2014 and forecast under-delivery of -17.8% for FY2015).
- Jacobs acknowledges TasWater's effort to develop and approve project business cases and ramp up its delivery capacity (see Section 3.2.3), which suggests that TasWater should be able to deliver \$110M/yr. nominal for FY2017 and FY2018.
- Jacobs finds that TasWater's proposed capital expenditure for PSP2 is not efficient. TasWater's current capital expenditure submission is unable to demonstrate prudence and efficiency at a program level, due to ambiguity around the projects that will be delivered in PSP2 and the risk associated with cost estimates for projects that are still in strategic planning and scoping phases
- However, most of the sample projects were found to be prudent and Jacobs does recognise and endorse TasWater's current efforts to develop and approve business cases for its high priority capital projects. TasWater has significant work ahead to get its systems and documentation to a state that would be expected from a mature water utility to support its regulatory expenditure submissions. Jacobs has observed a strong commitment across TasWater management to achieve this.
- Based on these findings, Jacobs recommends:
 - A reduction in TasWater's proposed capital expenditure for FY2016;
 - That the \$110M nominal value be adopted for FY2017;
 - An increase in TasWater's proposed capital expenditure for FY2018 so that TasWater's proposed level of capital expenditure remains unchanged.

As discussed in Section 3.1, Jacobs is unable to make a robust quantitative recommendation for the capital expenditure adjustments, but find a reduction of 10% in FY2016 (and corresponding increase in FY2018) reasonable given the above-mentioned factors. Therefore the proposed adjustments are summarised in **Table 9**. Given the low level of granularity in TasWater data, Jacobs is unable to disaggregate these adjustments across cost drivers and business segments for this regulatory review

- Jacobs appreciates that prices are more likely to be determined by price constraints for PSP2.

Table 9 – Recommended adjustment to TasWater's PSP2 Capital Expenditure (\$M, 2015\$)

	2015/16	2016/17	2017/18	Total PSP2
TasWater proposed expenditure for PSP2	\$107.25	\$104.57	\$101.96	\$313.78
Jacobs recommended adjustment	-\$10.73	\$0.00	\$10.73	\$0.00
	-10%	0%	+10.5%	0%
Jacobs recommended expenditure for PSP2	\$96.53	\$104.57	\$112.69	\$313.78

3.5 Asset and Capital Expenditure Classifications

This review included an audit and assessment of the accuracy with which TasWater has classified its existing assets and planned capital expenditure into the four cost driver categories specified in the Water and Sewerage Accounting Ring Fencing Guideline.

Finding: Jacobs finds that TasWater's values included in its Draft PSP2 submission reflect correct values using TasWater's current expenditure classification approach. However, this approach is not documented; and TasWater currently has a low level of granularity in the required data sets and assumptions, such that a quantitative assessment of the accuracy of these classifications is not possible at the time of this regulatory review. TasWater is aware of the need to improve the granularity in its regulatory accounts. Jacobs recommends that TasWater:

- Clarify with the Regulator the approach that must be taken to classify capital expenditure on existing (pre-July 2009) assets – to understand their impact on the RAB_{existing} and RAB_{new}. This should be resolved as part of the PSP2 determination process
- Improve the granularity of its asset life assumptions
- Clarify with the Regulator the categorisation of discharge-driven wastewater re-use schemes as regulated or unregulated assets/expenditure
- Clarify with the Regulator the capitalisation of CCTV (and other investigation activities)
- As an improvement opportunity, develop and implement a process for apportioning capital expenditure of large projects across multiple cost drivers and asset categories
- Ensure the AMIS it implements is compatible with its regulatory accounting and reporting requirements (including any continued use of Navision)

High level information has been provided by TasWater in its draft PSP2 submission, particularly within Attachment K, where asset values for each business segment (water, wastewater and unregulated) and expenditure for each cost driver (compliance, growth, renewals, improvement) are shown at an aggregate level. The source data for Attachment K is understood to include:

- For existing asset values – the asset audit and valuations performed by the three legacy regional organisations for their commencement of operations (with the transfer of assets from the 29 local councils), with straight-line depreciation applied as per the Ring Fencing Guideline.
- For planned capital expenditure – the TasWater Capital Works Program includes the primary cost driver for each capital project such that the cost driver allocation of each project can be understood. The values in the Capital Works Program were checked and found to be consistent with the values provided in Attachment K of the Draft PSP2.

Jacobs found no reporting errors within the information checked and is confident that the values included in Attachment K reflect correct values using TasWater's expenditure classification approach. However, this approach is not documented other than a brief discussion within the draft PSP and there is a low level of granularity in the required data sets and assumptions, which TasWater will need to address as a matter of urgency. Jacobs sees that this will need to include some involvement of the Regulator to confirm the interpretation of some definitions within the Ring Fencing Guideline.

TasWater should ensure that the AMIS it implements is compatible with its regulatory accounting and reporting requirements (including any continued use of Navision).

3.5.1 Granularity required for expenditure and asset values on new and existing non-current assets

The Regulator's *Price and Service Plan Guideline November 2013* requires TasWater to maintain two RABs as per the 2013 Price and Service Plan Guideline – a RAB_{existing} and RAB_{new} – where 'existing assets' are assets transferred to a regulated entity before 1 July 2011 under Part 3 of the *Water and Sewerage Corporations Act 2008*; and 'new assets' have been purchased or constructed by the previous regulated entities or TasWater, since 1 July 2009. A separate WACC is applied to each RAB. As such, TasWater should be able maintain its asset values and expenditure data to a level of granularity such that it can report:

- Value and classification data of **planned capital expenditure** relating to the purchase, development or construction of **new non-current assets**;
- Value and classification data of **planned capital expenditure** that will change the asset value of **existing non-current assets** (e.g. expenditure that will increase extend the service life, significantly reduce ongoing O&M, or increase an asset's capacity or functionality)
- Value and classification data of **existing non-current assets** for which **no capital expenditure** is planned for the current financial year and the upcoming second regulatory period.

This granularity of expenditure is currently not possible within TasWater's systems. TasWater are aware of this limitation.

Similarly, where capital expenditure has been spent after 1 July 2009 or is planned to be spent on existing non-current assets, TasWater have been unable to confirm the basis on which the appropriate WACC will be determined and applied. Jacobs believe that TasWater will need to determine the agreed approach with the Regulator, whether:

- The total updated asset value be maintained in the "roll-forward" RAB_{existing} (on which the statutory plus commercial rate of return is applied); OR
- The total updated asset value be removed from the RAB_{existing} and moved into the RAB_{new} (on which only a commercial rate of return is applied); OR
- The existing asset value and post-July 2009 capital expenditure be apportioned and allocated separately to the RAB_{existing} and RAB_{new}, such that different WACCs are applied to each; OR
- Another agreed approach.

Jacobs sees that this expenditure and asset valuation approach should be resolved at part of this PSP2 determination process.

3.5.2 Apportioning of capital expenditure of large projects across multiple cost drivers

Many of TasWater's current and planned CAPEX projects relate to capital works across multiple asset categories and/or multiple cost drivers – For example the Burnie Lion Trade Waste Scheme includes expenditure across pipelines and treatment asset categories and addresses growth, renewals and compliance drivers. Some projects also involve expenditure on regulated and unregulated services (e.g. Bridport STP Improvement Program).

Jacobs have requested evidence for the basis of any allocations made across multiple categories and cost drivers and found that no apportionment of expenditure across business segment and cost-drivers occurs. The primary cost driver is used.

Jacobs and TasWater agree that greater granularity in the allocation process is a valuable improvement opportunity. TasWater should develop and implement a process so that capital expenditure, particularly on large projects, is apportioned to multiple cost drivers and asset categories for its regulated accounts.

3.5.3 Improve the granularity of its asset life assumptions

TasWater's current asset life assumptions are listed in Table 19 of the Draft PSP2, which provides asset lives at a Ring Fencing asset category level (headworks, treatment, pipelines and channels, corporate). Jacobs understands that there is no further granularity in the asset life assumptions and so is unable to determine the validity of these estimates. Jacobs questions the basis on which a 40 year asset life is chosen for new headworks assets (which includes dams and reservoirs).

TasWater should establish default asset lives to a greater level of granularity, whether for each asset 'sub-category' (e.g. different asset lives for mechanical assets, electrical assets, instrumentation, civil assets, etc. within Treatment) and ultimately at a level of detail that incorporates the expected asset lives of individual cohorts (e.g. pipelines of different materials).

It is noted that the NPV calculations supporting many of TasWater's business cases do employ asset life estimates at the cohort level.

The calculations that have been used to generate the four *Average expected asset life (years)* within the 'depreciation' worksheet of Draft PSP Attachment K has not been provided to Jacobs and so was not able to be tested.

It is noted in the Regulator's *Price and Service Plan Guideline*, (Sections 3.1.1.3 and 3.2.1.3) that proposed depreciation rates for existing and new assets should be calculated on a straight-line basis.

3.5.4 Discharge-driven wastewater re-use schemes as regulated or unregulated assets/expenditure

As discussed in **Appendix B.14**, TasWater are implementing a 'discharge-driven' re-use scheme for Bridport and are implementing a similar re-use scheme for Beaconsfield. The key features of the Bridport scheme include:

- The re-use scheme will allow effluent to be re-used for irrigation rather than discharged to Anderson's Bay (as is currently the case). This is a preferred solution of TasWater, the EPA and the community of Bridport
- There is no third-party customer involved. TasWater have purchased a 367ha pine plantation to which it can transfer 100% of the STP effluent for irrigation purposes. The intent is that ownership of the plantation will remove any demand-risk for the effluent
- The re-use scheme will involve the construction of a new transfer pipeline and pumping station, a reservoir at the plantation, and minor upgrades at Bridport STP. This solution has significantly lower capital expenditure and a better (less negative) 30-year NPV than other non-reuse options such as a new activated sludge plant or an extended marine outfall
- TasWater's primary driver for construction of the scheme is to achieve compliance with EPA licence conditions at the underperforming Bridport STP - not to generate revenue
- However, ownership of the plantation can also provide the potential for future economic benefits through the harvesting of the pine trees in future years

Jacobs acknowledges that the Bridport re-use scheme presents environmental, community and economic benefits and is generally consistent with an operator exercising good industry practice (see **Appendix B.14** for further discussion). In particular, Jacobs appreciates that TasWater has an obligation to the EPA to investigate re-use as a preferred method of pollutant (effluent) disposal compared to discharges to surface waters or groundwaters³⁰. However, within the terms of reference of this review, Jacobs is required to give consideration to whether capital expenditure proposed for PSP2 should be included into TasWater's Regulatory Asset Base (RAB).

³⁰ State Policy On Water Quality Management 1997 Clauses 15.1(a), 16.2, 38

Jacobs has given consideration to the clauses and definitions of the *Water and Sewerage Industry Act 2008*; the Regulator's *Price and Service Plan Guideline November 2013*; and the Regulator's *Water And Sewerage Accounting Ring Fencing Guideline May 2013* relating to re-use schemes. In particular,

- CI 2.2.2 of the *Price and Service Plan Guideline November 2013* states that “reusing water, discharged from a sewage treatment plant, for irrigation” is an unregulated service and that “assets associated with providing unregulated services are to be excluded from the RAB in accordance with Regulator’s Accounting Ring Fencing Guideline”; where
- CI 4.4.6 of the *Water And Sewerage Accounting Ring Fencing Guideline May 2013* more specifically states that “Where a regulated entity provides reuse water to a **third party**, the regulatory financial statements must identify a proportion of assets used to generate revenue from reuse water. This proportion must be excluded from the RAB”.

Finding: As such, it is Jacobs’s opinion that the Bridport re-use scheme and other similar ‘discharge driven’ re-use schemes with no third-party customers are regulated activities and the proposed capital expenditure should be included into TasWater’s RAB. Accordingly, revenue to be generated through the harvesting of pine trees should also be incorporated in the Regulator’s pricing determination (relevant for future regulatory periods in the case of Bridport).

Recommendation: Noting this finding, Jacobs recommends that meaningful discussions should still be held between TasWater and the Regulator to discuss the intent, incentives and implications of these re-use schemes. In particular, the current clauses in the PSP Guideline and Ring Fencing Guideline may incentivise TasWater to setup further TasWater-owned plantation schemes – even where suitable third party customer demand may exist – such that the scheme is eligible for inclusion in the RAB.

It is Jacob’s opinion that the ownership and management of plantations as a regulated activity is not the intent of the Regulator’s guidelines and that third-party reuse schemes must be considered within a project options analysis (economic and multi-criteria) where there is the opportunity for full or partial cost recovery³¹.

For future discharge-driven re-use schemes, Jacobs would also expect TasWater to provide the Regulator with evidence (as per the objectives of the Ring Fencing Guideline) that it is not securing an unfair competitive advantage over other commercial pine plantations through cross-subsidisation from its regulated activities.

3.5.5 The capitalisation of CCTV and other investigation activities

As discussed in **Appendix B.5**, TasWater have proposed to capitalise the CCTV program costs. Interpreting the Regulator’s definition of capital expenditure in its *Water and Sewerage Accounting Ring Fencing Guidelines*, CCTV inspections may be deemed to be appropriate to capitalise as this expenditure will either lead to the development of a new asset or reduce the ongoing maintenance costs of the existing asset.

Jacobs notes that from its general business, technical and regulatory experience that CCTV expenditure would more generally be split between OPEX and CAPEX depending the nature of the activity and the purpose to which the information collected is applied or used. For asset management purposes there are typically three types of asset condition inspections (whether involving CCTV or other means) – Level 1, Level 2 and Level 3. Typically Level 1 inspections are focussed on collecting baseline sewer asset condition information and/or periodic general sewer condition assessment information as part of a routine program to update or confirm asset condition status or as part of overarching investigations. Level 2 inspections (whether involving CCTV or other means) are typically undertaken where a sewer has been identified as potentially having an unacceptable risk (combination of structural and service probability of “failure” and consequence of that failure) and the

³¹ Jacobs acknowledges that TasWater did consider a third-party re-use scheme in the options analysis for Bridport (Option 7) and that it had a higher NPC that the pine plantation option being implemented, but that this result is contingent on the future revenue from the harvesting of the pine trees. Equally, Jacobs appreciates that if the scheme was to be excluded from the RAB and other funding mechanisms were required, the NPC of the third-party re-use option would itself be higher.

purpose of the inspection is to confirm the extent of the problem and confirm the risk and the need for action or otherwise. The outcome of the Level 2 inspection might involve renewal, refurbishment or enhanced maintenance or it might involve patch repairs or deferral of expenditure (e.g. by refining the timing of renewal). Level 3 inspections (whether involving CCTV or other means) are typically undertaken once a risk and the decision to act is confirmed (e.g. sewer renewal required) with the purpose of obtaining detailed information to inform the renewal / refurbishment option to be adopted and the detailed design.

Jacobs considers that Level 1 sewer asset condition inspection expenditure would be typically OPEX, Level 3 inspection expenditure would be typically CAPEX and Level 2 expenditure could be either OPEX or CAPEX although on balance generally CAPEX. On this basis only Level 3 sewer asset inspection expenditure and potentially a high proportion of Level 2 expenditure are appropriate to be capitalised.

As discussed in **Appendix B.5**, TasWater have provided sufficient evidence to satisfy Jacobs that, in the main, the CCTV program consists of inspections that are Level 2 and 3 in nature, particularly as they reflect a risk based approach and target locations where failures are known to have occurred or there is existing ongoing maintenance requirements. On this basis, most of the CCTV sewer inspection expenditure could be capitalised.

The Regulator may choose to treat this differently in the short term taking into account the different potential impacts on prices. Regardless, some clarity of the Regulator's Water and Sewerage Accounting Ring-fencing Guidelines seems required to take account of the above practicalities at least for the next regulatory period and beyond.

4. Operating Expenditure Review

4.1 Review Approach

To undertake this aspect of Jacobs' review, a three part approach was used:

- Establish the prudent and efficient operating expenditure base in 2013/14 (the last year of available actual expenditure) from which to forecast operating expenditure going forward;
- Ensure that the 2013/14 costs have been escalated in line with the Regulator's indexation requirements for the period 2015/16 – 2017/18;
- Establish whether there are any changes beyond indexation which should be taken into account for the period 2015/16 – 2017/18, including the impact of the proposed capital program and efficiency requirements.

As with capital expenditure, an evidence based strategic review was employed – conducted through examining TasWater's corporate documentation, including its Annual Reports, Corporate Plans, Financial Statements and Budget reports, TasWater's PSP2 submission, TasWater's responses to a RFI and discussions with relevant TasWater personnel.

Jacobs notes that the information provided to undertake this operating expenditure review, including the response to the draft report, has been very limited and provided quite late in the review, which has constrained its ability to make detailed findings in relation to the proposed operating expenditure program. More disaggregated information would enable more detailed and meaningful findings.

However, as with the rest of the review, Jacobs is mindful that it is being conducted a little over a year after TasWater commenced operations. As a result, it is aware of the challenges that TasWater has encountered in aggregating the financial systems and processes of four businesses to establish consistent, robust and accurate operating expenditure information. As noted by TasWater, the level of maturity of its general ledger structure for operating expenditure while improving, has constrained its ability to analyse certain costs at a detailed level.

4.2 Summary of Key Findings and Recommendations

Jacobs makes the recommendations set out below as a result of its review, with the basis for its recommendations set out in the following sections.

Operating Expenditure Recommendations

- The prudent and efficient operating expenditure in the Regulator's 2012 determination for 2013/14 should be used as the base from which forecast expenditure in 2015/16 – 2017/18 is determined. This is \$154.9M, which is \$1.8M lower than TasWater reported in its Draft PSP2, Attachment K.
- There should be no real increases in TasWater's operating expenditure for the period 2015/16 – 2017/18, i.e. the operating expenditure for 2013/14 in the Regulator's 2012 determination should be maintained in real terms.
- Given the information available, it is appropriate to increase operating expenditure by \$0.7M in 2015/16, \$1.0M in 2016/17 and \$1.4M in 2017/18 to reflect the impacts of the proposed capital program.
- Recognising the full year recurring savings (realised and forecast realisable) from the merger creating TasWater, the annual operating expenditure for the period 2015/16 – 2017/18 should be reduced by \$5.86M.
- Annual regulatory operating expenditures should be \$149.8M in 2015/16, \$150.1M in 2016/17 and \$150.5M in 2017/18.
- There are various mechanisms available to the Regulator to further incentivise TasWater to achieve greater efficiencies during the period 2015/16 – 2017/18.

Jacobs appreciates that TasWater has recently formed and is still developing its processes, systems and capabilities. It considers that the operating (and capital) expenditure should be a key focus moving forward for the business, particularly as it is a key contributor to the overall financial health of the business and ultimately the prices that customer will be paying. Key areas of focus are set out below.

Key Operating Expenditure Focus Areas

- Improved information, ability and capability to explain the key drivers and reasons for changes in operating expenditure business segments (e.g. water and sewerage) and activity areas and to substantiate that narrative with documented evidence.
- Development of strong linkages between the capital and operational planning processes and the operating expenditure planning process.
- In a related sense, linking of operating expenditure and service level requirements and outcomes.
- An ongoing focus on the future efficiency benefits from the merger and more generally.
- Improved understanding of the difference between the financial and regulatory treatment of operating expenditure items and greater focus on the statutory operating expenditure limit set by the Regulator.
- Greater rigour around the regulatory operating expenditure estimate for each year of the review period in general including the ability to reconcile various views of expenditures from different sources (for differing purposes within TasWater), particularly in terms of actual regulatory operating expenditure, and to ensure ongoing management, review and reprioritisation of regulatory operating expenditure occurs.

If the Regulator's 2012 determination is used as the starting point for the basis of assessment, the operating expenditure recommendations at a high level are summarised in **Table 10**. This also includes a comparison of how the recommended expenditure compares to TasWater's proposed expenditures. Over the forward years, Jacob's view of expenditure on this basis is around \$6.5M per annum lower than that proposed by TasWater.

Table 10 –Jacob's view of expenditures and a comparison to TasWater's proposed expenditures (\$2015)

	2013/14 (\$M)	2014/15 (\$M)	PSP2		
			2015/16 (\$M)	2016/17 (\$M)	2017/18 (\$M)
Jacobs Assessment of TasWater Regulatory Operating Expenditure					
2012 Regulator determination (statutory opex limit)	\$154.9				
Add Substantiated additional expenditure	\$0.0				
Less Merger savings	-\$2.7				
Total 2013/14 (and starting expenditure for future years)	\$152.2	\$152.2	\$152.2	\$152.2	\$152.2
Add Indexation for salaries, power and chemicals		\$0.0	\$0.0	\$0.0	\$0.0
Add Operating expenditure associated with new capex		\$0.3	\$0.7	\$1.0	\$1.4
Less Further merger savings		-\$3.2	-\$3.2	-\$3.2	-\$3.2
Total for forward years		\$149.3	\$149.8	\$150.1	\$150.5
TasWater proposed PSP2 Operating expenditure					
Total for forward years			\$156.3	\$156.6	\$156.8
Difference - Jacobs view of expenditure compared to TasWater proposed expenditure					
Total for forward years			-\$6.5	-\$6.5	-\$6.4

These recommendations are based on the following:

- In 2013/14 insufficient information and evidence has been provided to establish any additional expenditure above the regulatory operating expenditure for 2013/14 implicit in the Regulator's 2012 PSP1 determination as being prudent and efficient;
- As per the independent audit report on the savings from the merger, around a half year of recurrent realisable savings was achieved in 2013/14 and a full year is forecast in 2014/15. Additional savings are also forecast in 2014/15 which are not yet realised;
- For the forward years, insufficient information and evidence has been provided to justify additional operating expenditure for indexation of salaries, power and chemicals;
- An allowance is appropriate for additional annual operating expenditure of as a result of the capital program in the forward years.

Jacobs also considered the impact of using an alternative 2013/14 base, but keeping all other things constant. As set out in **Table 11**, using TasWater's 2013/14 Annual Report operating expenditure (adjusted for non-cash items) as the base leads to an annual operating expenditures (\$2014/15) of \$154.1M in 2015/16, \$154.4M in 2016/17 and \$154.8M in 2017/18. As can be seen, even using this alternative view of the base, operating expenditure would be around \$2.1M lower than proposed by TasWater.

Table 11 – Jacobs alternative view of 2013/14 expenditures and a comparison to TasWater's proposed expenditures (\$2015)

	PSP2				
	2013/14 (\$M)	2014/15 (\$M)	2015/16 (\$M)	2016/17 (\$M)	2017/18 (\$M)
Jacobs alternative view TasWater Regulatory Operating Expenditure					
<i>TasWater 2013/14 Annual Report - adjusted for non-cash items (and starting expenditure for future years)</i>	\$156.6	\$156.6	\$156.6	\$156.6	\$156.6
<i>Add</i> Indexation for salaries, power and chemicals		\$0.0	\$0.0	\$0.0	\$0.0
<i>Add</i> Operating expenditure associated with new capex		\$0.3	\$0.7	\$1.0	\$1.4
<i>Less</i> Further merger savings		-\$3.2	-\$3.2	-\$3.2	-\$3.2
<i>Total for forward years</i>		\$153.7	\$154.1	\$154.4	\$154.8
TasWater proposed PSP2 Operating expenditure					
<i>Total for forward years</i>			\$156.3	\$156.6	\$156.8
Difference - Jacobs view of expenditure compared to TasWater proposed expenditure					
<i>Total for forward years</i>			-\$2.2	-\$2.1	-\$2.0

Over the forward years, Jacob's view of expenditure on this basis is around \$2.1M per annum lower than that proposed by TasWater. One explanation for this is that TasWater still has embedded in its proposed expenditure some non-cash items and/or it has not carried forward the merger savings fully into the PSP2 period.

TasWater has consistently put forward that its view that the operating expenditure proposed is "conservative" approach. While this view is not unreasonable, in light of the above it is less persuasive.

4.3 Operating Expenditure Review

4.3.1 Review of actual and budgeted operating expenditure (2012/13 – 2014/15)

Jacobs sought to establish the prudent and efficient operating expenditure base for 2013/14 (the last year of available actual expenditure) from which to forecast operating expenditure going forward. To do this it reviewed the actual and budgeted operating expenditure for the period 2012/13 – 2014/15 and compared it to the Regulator's 2012 determination of operating expenditure as well as other comparable water authorities.

Comparison against the Regulator's 2012 determination

TasWater's PSP2 does not include operating expenditure details for the period 2012/13 – 2014/15.

Jacobs sought this information from TasWater, and using the various sources available reviewed actual operating expenditure in 2012/13 and 2013/14, and budgeted operating expenditure in 2014/15, against the statutory operating expenditure limit set by the Regulator in its 2012 determination.

In relation to the actual regulatory operating expenditure for 2012/13 and 2013/14, Jacobs notes that there are various views depending on the source (and primary purpose from which the information was derived). This is illustrated in **Figure 9**, which sets out actual 2013/14 operating expenditure from different sources. Possible reasons for the differences include inclusion of unregulated expenditure or inclusion of expenditure which is non-cash in nature and not generally included in a regulatory view (e.g. interest or depreciation).

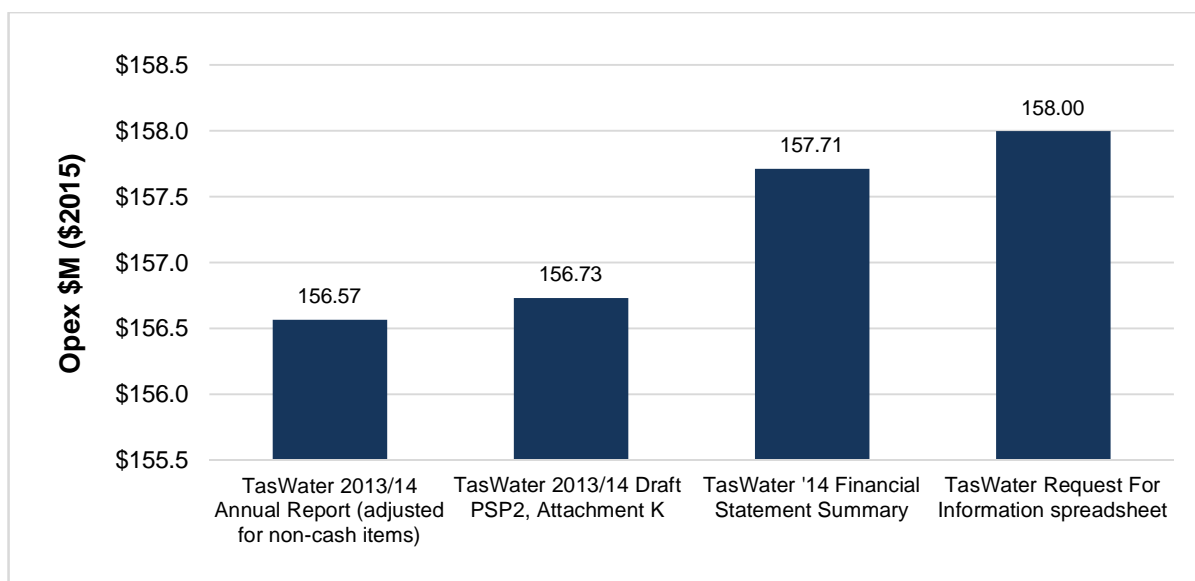


Figure 9 – 2013/14 TasWater actual operating expenditure

In the time available, Jacobs was not able to reconcile these actual results and notes the context in which this information was being prepared, as four businesses transitioned to one (TasWater), and that the different sources may have different purposes. However, Jacobs would expect that moving forward TasWater would have a clear audit trail and be able to easily reconcile operating expenditures from different sources as well as any variances with the statutory operating expenditure limits set by the Regulator. Jacobs notes that TasWater has advised (without substantiation) that the last column in **Figure 9** may have an overstated amount of approximately \$0.27M which may bring into line with the second last column.

The statutory operating expenditure limits underpinning the determination by the Regulator in its 2012 determination were made for each separate business prior to the merger. Jacobs has aggregated these limits

and while it would have preferred to undertake its analysis at the business segment (e.g. water and sewerage) and activity area level of operating expenditure, the following issues have limited its ability to do so:

- The Regulator's 2012 determination does not provide this information disaggregated by function
- The updated PSPs for each business following the Regulator's 2012 determination do not reconcile back to the regulator's statutory limit and provide different levels of information such that it is not possible to aggregate it to form a total business segment and activity area view of regulatory operating expenditure.

Using these aggregated results, Jacobs compared the Regulator's 2012 determination and TasWater actual operating expenditure. **Figure 10** provides this comparison for 2013/14 and illustrates via the initial column, and the corresponding red line indicating the statutory operating expenditure limit set by the Regulator that irrespective of the source of actual information, TasWater's expenditure in 2013/14 exceeded its statutory limit.

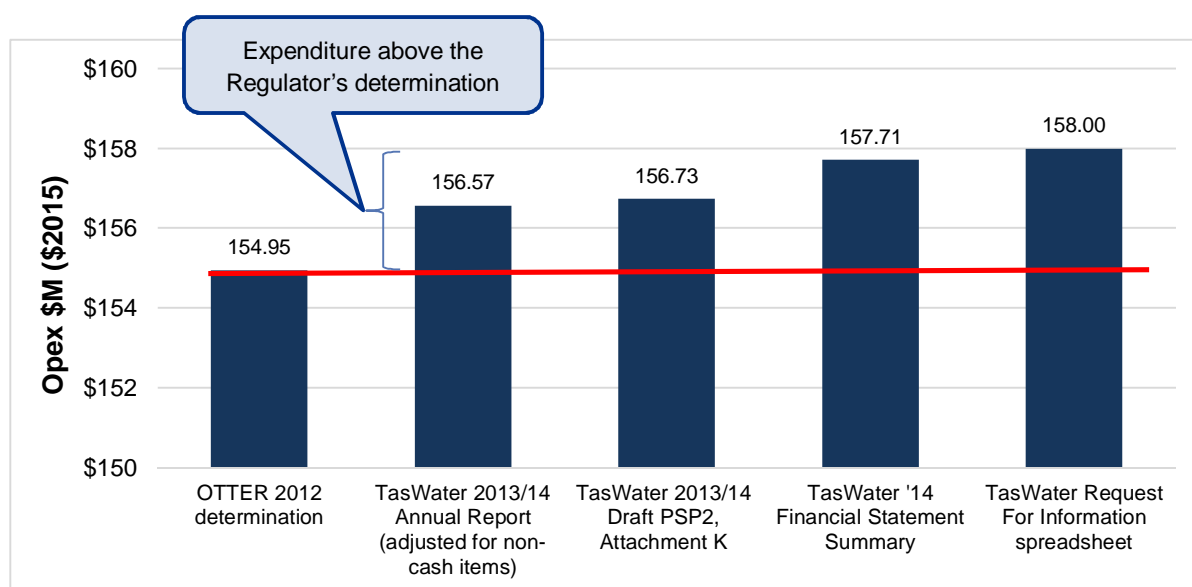


Figure 10 – 2013/14 TasWater actual operating expenditure compared to the Regulator's 2012 determination

Given the lack of detailed information, it was difficult to establish if this over expenditure was prudent and efficient relative to the Regulator's 2012 determination.

To assist with understanding some of the possible reasons for the variances in 2013/14 to the 2012 determination, Jacobs has examined the FY'14 Financial Statement Summary provided by TasWater. This report suggests that relative to the budgeted operating expenditure (not the Regulator's 2012 determination), actuals were higher than planned as a result of the following key areas of expenditure:

- Salaries and related personnel expenditure – this was driven by less capitalisation of salaries than anticipated as a result of the capital plan being significantly under spent, there being a large number of smaller projects which attract less capitalisation and a greater degree of preliminary planning. TasWater has advised that there is now a greater focus on capitalisation, with weekly reports being provided to the Asset Owners Steering Committee. Salary costs themselves were underspent
- Materials and services – this was driven by significant unbudgeted activities in relation to electrical and instrumentation testing, odour control costs mainly in the northern region and major de-sludging work at a STP.

To further inform its analysis, Jacobs has also examined the FY15 Budget Report for 2014/15 provided by TasWater which sets out some of the key assumptions behind the budgeted cost. This report notes that:

- Chemical and power costs have historically increased by more than the standard inflation rate of 2.5% and therefore have been increased by 4% and 5% respectively (without adequate supporting information);

- The materials and services budget includes expenditure for a number of activities that are scheduled to address a backlog of work for de-sludging, bio-solids disposal, ground maintenance/vegetation control and access road repair; and
- Contingency costs of around \$5M have been added to the budget for materials and services (e.g. for a the backlog activities noted above, as well as additional activities including reservoir cleaning, clarifier and trickling filter maintenance, network cleaning and maintenance), electricity (to allow for uncertainty around volumes) and consultancy costs (to allow for currently unidentifiable projects or project of unknown scope – ‘known unknowns’).

It appears likely to Jacobs that costs of the above nature will also be driving TasWater's over expenditure relative to the Regulator's 2012 determination for 2013/14. Based on the available evidence, it is difficult to conclude that increased costs of this nature are prudent or efficient. Jacobs considers that expenditure of this nature should be managed within the normal course of business and that either better planning should occur so that operating expenditure is linked to future capital plans, operations and maintenance plans (including those prepared to address issues of backlog such as the de-sludging), etc. or there should be re-prioritisation of expenditure within the year to manage any over expenditure.

Further, Jacobs notes that while both of the above TasWater financial reports discuss the savings from the merger (said initially to be \$2.5M in 2013/14 and \$5-5.5M in 2014/15) these are not apparent in the over expenditure relative to the Regulator's 2012 determination detailed above. Implementation costs, detailed at \$1.1M for 2013/14 in the FY'14 Financial Statement Summary provided by TasWater, in effect reduce the savings for that year to \$1.4M.

In its response to the draft report, TasWater stated that the reform merging the three regional water authorities, and their jointly owned shared service provider, into one has necessitated significant restructuring that has eliminated the duplication of management layers and put in place a state-wide operating model. Further that the actual (audited) cost savings in 2013/14 were \$2.7M. As a result, TasWater considers its projections are a more appropriate base for determining expenditure for the period 2015/16 – 2017/18.

Jacobs considers the statutory operating expenditure limit set by the Regulator in its 2012 determination for 2013/14 is the appropriate base. The regulator set a prudent and efficient level of expenditure, and without any evidence to substantiate higher levels of expenditure, this should serve as the base. The half year of savings from the merger (\$2.7M) should also be reflected in the base (see Section 4.3.2 for a discussion of how the merger savings should be incorporated into future expenditures).

National Performance Report benchmarking

In order to inform its analysis, Jacobs has also considered TasWater's performance relative to that of other water businesses across Australia. To do this it has used the 2012/13 National Performance Report³² for the urban water utilities, and the operating cost per connected property (combined water and sewerage). This information is collected for all water authorities across the country and classified according to the number of connected properties. The most recent and historical results for the three Tasmanian water authorities merged to form TasWater are provided in **Table 12**, along with relevant comparators.

Jacobs has included the comparators used by the Regulator in its 2012 determination for consistency. These water authorities were used given they had comparable water and sewerage network length (km), the number of water and sewerage treatment plants, the number of residential and non-residential properties connected to the respective water and sewerage infrastructure and the value of water and sewerage assets operated by the provider. In the main this is still the case, although it is noted that Barwon Water now has more than 100,000 connected properties.

The ability to compare water authorities is not straightforward and in its response to the draft report, TasWater noted its concerns that the benchmarking does not take account of some significant differences between

³² National Water Commission 2014, National performance report 2012–13: urban water utilities, NWC, Canberra. This is the most recent National Performance Report available. The 2013-14 NPR is expected to be available (through the Bureau of Meteorology) in March 2015.

organisations. For example, Victoria and Tasmania are quite different with respect to topography, population density and dispersion of towns. It does not consider the benchmarking comparisons meaningful or useful.

Jacobs agrees that benchmarking is not straightforward and that in some cases there may be differences between businesses. However, benchmarking is used as a guide to indicate what similar, if not exactly the same, businesses are achieving in terms of operational efficiency to serve similar customer numbers using similar asset bases. Examining the median cost also assists in this regard.. Overall, and notwithstanding TasWater's observations, there is an onus on TasWater to adopt an appropriate alternative form of benchmarking if it does not consider the national water industry comparators appropriate. More specific rather generic explanations of the reasons for the variations between comparator water businesses.

As can be seen in **Table 12**, both Southern Water and Ben Lomond Water had higher costs than their relevant comparator, with the costs for Southern Water far higher than Barwon Water (by around \$230 per property). Cradle Water had lower costs per property than Wannon Water but higher costs than North East Water. In all cases, in 2012/13 the cost per property increased for the Tasmanian water authorities but decreased for the relevant comparators (which are all in Victoria).

Table 12 – Tasmanian water utility and relevant comparators – combined water and sewerage operating cost (\$/property)

Business	2009/10	2010/11	2011/12	2012/13	% change from 2011/12
Utilities with between 50,000 – 100,000 connected properties					
Southern Water	688	737	757	829	9%
Barwon Water	646	628	681	596	-12%
Ben Lomond Water	609	704	738	809	10%
Goulburn Valley	748	751	812	781	-4%
Utilities with between 20,000 – 50,000 connected properties					
Cradle Mountain Water	788	766	848	887	5%
Wannon Water	953	992	1065	957	-10%
North East Water	756	766	838	734	-12%

Table 13 – National Performance Report for urban water utilities – combined operating cost—water and sewerage (\$/property)

Size group	Range		Number of utilities with increase / decrease from 2011-12		Median		% change in the median from 2011-12
	High	Low	Increase	Decrease	2011-12	2012-13	
100 000+ connected properties	988	574	5	6	709	693	-2%
	Queensland Urban Utilities	WC (Perth)					
50 000 to 100 000 connected properties	1 283	513	10	3	757	805	6%
	Gippsland Water	Toowoomba					
20 000 to 50 000 connected properties	1 263	596	10	8	839	879	5%
	Mackay Water	Lower Murray Water					
10 000 to 20 000 connected properties	2 012	660	13	7	967	1 029	6%
	P&W (Alice Springs)	Westernport Water					
All size groups (national)	2 012	513	38	24	838	844	1%
	P&W (Alice Springs)	Toowoomba					

Note: Single-service utilities are excluded from the summary table.

Jacobs notes that the 2012/13 water and sewerage operating costs per property for each of the three previous Tasmanian water authorities are comparable with the median costs in the relevant size group. For example, with an operating cost of \$829 per connected property in 2012/13 Southern Water is \$24 above the median cost for all water authorities servicing 50,000 – 100,000 connections and Ben Lomond Water is \$4 above the median. The median costs (as well as the high and low ends of the range) are set out in **Table 13**.

In 2013/14 TasWater was formed via the merger of the three previous water authorities. As a result, TasWater will now service over 100,000 connected properties (and closer to 200,000 properties). In this regard, the median operating cost per property in 2012/13 was \$693, which is significantly lower than the stand-alone operating cost per property for the three previous authorities. To illustrate the challenges for TasWater, using its actual 2013/14 operating expenditure from the Draft PSP2, Attachment K (\$156.7M) and to be conservative an assumed connected properties of 205,000³³, this results in an operating cost per connected property of \$765 as compared to \$728 per connected property when the median cost is converted to real 2014/15 dollars.

Conclusions

Taking into account the above analysis, Jacobs is of the view that the statutory operating expenditure limit set by the Regulator in its 2012 determination for 2013/14 should be used as the base from which to forecast expenditure going forward. This is \$154.9M, which is \$1.8M lower than TasWater reported in its Draft PSP2, Attachment K. It considers that there is insufficient evidence to determine that a higher operating expenditure is justified as being prudent and efficient, particularly given it appears that total actual expenditure is high relative to comparable industry benchmarks.

4.3.2 Review of proposed operating expenditure (2015/16 – 2017/18)

Jacobs sought to ensure that the 2013/14 costs have been escalated in line with the Regulator's indexation requirements for the period 2015/16 – 2017/18 and establish whether there are any changes beyond indexation which should be taken into account for the period 2015/16 – 2017/18, including the impact of the proposed capital program and efficiency requirements. To do this it reviewed the forward indexation assumptions and whether any other expenditure had been proposed for inclusion.

TasWater's proposed operating expenditure for the period 2015/16 – 2017/18 is outlined in **Table 14**, as included in its PSP (on a nominal dollar basis). While increasing over time to reflect indexation, when this is removed, in real terms TasWater's proposed operating expenditure increases only slightly over the three years. This can be seen in **Table 15**, which summarises the nominal and real disaggregated expenditures and their difference (dollar and percentage) year on year. From 2014/15 real expenditures are increasing only slightly as can be seen in the column titled '% Difference Yr on Yr REAL'. In preparing this information, TasWater noted that it had not applied the specific escalation factors referred to in below, but had averaged the increases across all costs. The nominal expenditures in this table reconcile back to the total operating cost in **Table 14**. We see that **Table 15** also highlights that some expenditures increased substantially between 2013/14 and 2014/15, for example, sludge handling.

Table 14 – TasWater's proposed operating expenditure – 2015/16 – 2017/18 (\$M nominal)

	2015/16	2016/17	2017/18
Total operating costs	164.4	168.9	173.5
Unregulated operating costs	4.1	4.2	4.3
Regulated operating costs	160.3	164.7	169.2

Further detailed breakdown of operating expenditure by major cost component for 2013/14 and 2014/15 are provided in **Table 15** and **Table 16** with real and nominal year-on-year variations (\$2014/15).

³³ TasWater's 2013/14 Annual Report states that there are 204,137 properties serviced by water and 180,408 properties serviced by sewerage.

Table 15 – TasWater’s proposed operating expenditure – 2013/14 – 2014/15 (\$M nominal and \$M 2015)

Operating cost component	2013/14 BASE YEAR				2014/15 - 2013/14				2014/15		2015/16 - 2014/15			
	TasWater Actuals NOMINAL	TasWater Budget NOMINAL	TasWater Actuals REAL	TasWater Budget REAL	\$	\$	%	%	TasWater Budget NOMINAL	TasWater Budget REAL	\$	\$	%	%
					NOMINAL Difference Year on Year	REAL Difference Year on Year	Difference Yr on Yr NOMINAL	Difference Yr on Yr REAL			NOMINAL Difference Year on Year	REAL Difference Year on Year	Difference Yr on Yr NOMINAL	Difference Yr on Yr REAL
Electricity	12,716	12,259	13,034	12,565	654	336	5.15%	2.58%	13,370	13,370	339	-4	2.54%	-0.03%
Other utilities	0	0	0	0	0	0			0	0	0	0		
Chemicals	5,749	5,579	5,893	5,719	-446	-590	-7.76%	-10.01%	5,303	5,303	135	-1	2.54%	-0.03%
Royalties	2,242	2,492	2,298	2,554	269	213	12.01%	9.28%	2,511	2,511	64	-1	2.54%	-0.03%
Bulk water	0	0	0	0	0	0			0	0				
Sludge handling	1,865	1,919	1,911	1,967	1,995	1,949	106.99%	101.94%	3,860	3,860	98	-1	2.54%	-0.03%
Materials	27,119	25,358	27,797	25,992	1,872	1,194	6.90%	4.30%	28,991	28,991	735	-8	2.54%	-0.03%
Labour	71,823	66,881	73,619	68,553	-1,734	-3,529	-2.41%	-4.79%	70,089	70,089	1,778	-19	2.54%	-0.03%
Corporate costs (other)	19,851	20,120	20,347	20,623	1,042	546	5.25%	2.68%	20,893	20,893	530	-6	2.54%	-0.03%
Licence fees	2,479	2,531	2,541	2,595	766	704	30.90%	27.70%	3,245	3,245	82	-1	2.54%	-0.03%
External resources	579	1,338	593	1,372	829	815	143.37%	137.44%	1,408	1,408	36	0	2.54%	-0.03%
Water Sampling	2,944	3,019	3,018	3,095	-156	-230	-5.30%	-7.61%	2,788	2,788	71	-1	2.54%	-0.03%
Motor Vehicle	3,868	3,946	3,964	4,044	309	212	7.98%	5.34%	4,176	4,176	106	-1	2.54%	-0.03%
IT	2,912	3,252	2,985	3,333	814	741	27.96%	24.84%	3,727	3,727	95	-1	2.54%	-0.03%
Other														
TOTAL	154,145	148,694	157,999	152,411	6,215	2,362	4.03%	1.49%	160,360	160,360	4,068	-43	2.54%	-0.03%

Table 16 Variations in TasWater's operating expenditure (Year-on-year) for PSP2 regulatory period (real and nominal actual \$ and % differences) – in real 2014/15 \$

Operating cost component	2015/16		2016/17 - 2015/16				2016/17		2017/18 - 2016/17				2017/18	
	TasWater forecast NOMINAL	TasWater forecast REAL	\$ NOMINAL Difference Year on Year	\$ REAL Difference Year on Year	% Difference Yr on Yr NOMINAL	% Difference Yr on Yr REAL	TasWater forecast NOMINAL	TasWater forecast REAL	\$ NOMINAL Difference Year on Year	\$ REAL Difference Year on Year	% Difference Yr on Yr NOMINAL	% Difference Yr on Yr REAL	TasWater forecast NOMINAL	TasWater forecast REAL
Electricity	13,709	13,366	374	21	2.73%	0.16%	14,083	13,388	384	22	2.73%	0.16%	14,468	13,409
Other utilities	0	0	0	0			0	0	0	0			0	0
Chemicals	5,437	5,301	148	8	2.73%	0.16%	5,586	5,310	152	9	2.73%	0.16%	5,738	5,319
Royalties	2,574	2,510	70	4	2.73%	0.16%	2,645	2,514	72	4	2.73%	0.16%	2,717	2,518
Bulk water	0	0					0	0	0	0			0	0
Sludge handling	3,958	3,859	108	6	2.73%	0.16%	4,066	3,865	111	6	2.73%	0.16%	4,177	3,871
Materials	29,726	28,983	811	46	2.73%	0.16%	30,537	29,029	834	47	2.73%	0.16%	31,371	29,076
Labour	71,867	70,070	1,961	112	2.73%	0.16%	73,828	70,183	2,015	113	2.73%	0.16%	75,843	70,296
Corporate costs (other)	21,423	20,888	584	33	2.73%	0.16%	22,008	20,921	601	34	2.73%	0.16%	22,608	20,955
Licence fees	3,327	3,244	91	5	2.73%	0.16%	3,418	3,249	93	5	2.73%	0.16%	3,511	3,254
External resources	1,444	1,408	39	2	2.73%	0.16%	1,483	1,410	40	2	2.73%	0.16%	1,524	1,412
Water Sampling	2,859	2,787	78	4	2.73%	0.16%	2,937	2,792	80	5	2.73%	0.16%	3,017	2,796
Motor Vehicle	4,282	4,175	117	7	2.73%	0.16%	4,399	4,182	120	7	2.73%	0.16%	4,519	4,189
IT	3,821	3,726	104	6	2.73%	0.16%	3,925	3,732	107	6	2.73%	0.16%	4,033	3,738
Other														
TOTAL	164,428	160,317	4,486	257	2.73%	0.16%	168,914	160,574	4,611	259	2.73%	0.16%	173,525	160,833

Forward indexation

In its PSP2, TasWater notes that an assumed inflation rate of 2.5% has been applied to all expenditure items with the exception of salaries (3%) and power and chemicals (4%), although the PSP then somewhat confusingly says that non-labour operating expenditure will be maintained in real terms over the period.

During its review Jacobs was provided with additional detail around key cost components for the forward years. In this more detailed information, all cost categories (including chemicals, power as well as salaries and related personnel expenditure) were indexed consistently and not by differentiated factors for salaries, power and chemicals. TasWater later clarified this, noting that in providing this information an overarching assumption of a constant escalation factor (0.16% increase in real terms) was applied but the specific indexation rates noted above were correct. Jacobs also notes that this information included regulated and unregulated expenditure.

The Regulator's PSP Guideline states that 'Labour OPEX will be projected forward, in real terms, to reflect forecast real increases in the Average Weekly Earnings. The projected growth in labour costs is to be offset by an annual labour productivity factor.' Further, it notes that 'non-labour OPEX will be maintained in real terms'.³⁴

TasWater has not sought to justify its proposed increase of 3% for salaries by linking it to Average Weekly Earnings or by providing any offsetting annual labour productivity benefit. Jacobs notes that the Full-Time Adult Average Weekly Total Earnings in May 2014 were \$1,516.90, a rise of 2.3% from the same time the previous year.³⁵ This is below TasWater's proposed indexation for both salaries and its more general CPI indexation of 2.5%. Jacobs also notes that TasWater did not provide any details in relation to its staffing numbers over the period or its overall strategy including the interrelationship between capitalised labour and operating labour expenditure.

In addition, TasWater has provided limited evidence or justification around its proposed 4% increase in power and chemical costs. It has noted that historically these costs have increased by more than inflation but not provided any substantiating evidence beyond stating that:

- In relation to power costs, it has engaged a consultant to provide preliminary advice around future price increases.
- In relation to chemical costs, historical increases reflect the limited suppliers in Tasmania, meaning in reality TasWater is largely a price taker (it does not appear that there are yet many State-wide contracts in place to take advantage of the economies of scale from the merger).

Given this lack of evidence and justification, with no further information provided by TasWater in response to the draft report, and consistent with the Regulator's PSP Guidelines, Jacobs considers that there should be no real increases in TasWater's operating expenditure for the period 2015/16 – 2017/18. If TasWater is able to provide further evidence in relation to the basis for its proposed 4% increases to power and chemical costs, including historical price movements, contractual arrangements or expert advice then such increases may be considered appropriate.

In terms of general CPI indexation, Jacobs considers that on average an assumption of 2.5% appears to be appropriate given the latest CPI movements both for Australia and Hobart, as set out in **Table 17**.

Table 17 – All groups CPI³⁶

Location	June Qtr 2013 to June Qtr 2014	Sept Qtr 2013 to Sept Qtr 2014
Australia (weighted average of eight capital cities)	3%	2.3%
Hobart	2.8%	1.9%

³⁴ Regulator PSP Guidelines, pg. 16.

³⁵ Australian Bureau of Statistics <http://www.abs.gov.au/ausstats/abs@.nsf/mf/6302.0>

³⁶ Australian Bureau of Statistics

<http://www.abs.gov.au/AUSSTATS/abs@.nsf/allprimarymainfeatures/734AE198EFB033B0CA257D78000F9AEB?opendocument>
<http://www.abs.gov.au/AUSSTATS/abs@.nsf/Latestproducts/6401.0Main%20Features1Sep%202014?opendocument&tabname=Summary&prodno=6401.0&issue=Sep%202014&num=&view=>

Other issues impacting future operating expenditure

Desludging Costs

Desludging costs are a significant component of TasWater's current and future operating expenditure. It is evident even from the limited information available from TasWater, and in discussions with it, that there is an urgent need to address both historical and future sludge generation for a variety of reasons including the impact of previous ad-hoc approaches on EPA licence breaches as well as for practical, operational (recovery of "treatment capacity") and economic reasons. The predecessor water businesses do not appear to have had any clear documented strategy and action plan to manage and dispose of sludge generated from wastewater treatment plants. Neither does TasWater yet have such a sludge management strategy and a linked action plan (works and expenditure), although it intends to address this early in PSP2.

The sludge management strategy needs to address both the accumulated sludge from past operations (a "catch up" issue), primarily from the desludging of lagoons but also from various other treatment plant facilities, and the future management of sludge continuously generated from ongoing treatment plant operations.

In the absence of such a strategy TasWater has provided some detailed spreadsheet information on a wastewater by wastewater treatment plant basis which might inform such a strategy and a clearly articulated action plan - including sludge volumes, sludge concentrations, estimated accumulated dry solids mass, annual sludge accumulation/generation rates, estimated desludging periods, implied unit costs and estimated overall expenditure.

Jacobs has only been able to undertake a limited review because this information has not been into any context, for example the extent of impact on licence breaches or the recovery time to achieve long term stable sludge management operation at the various wastewater treatment plant sites, or prioritisation of the works to be undertaken (or sites to be addressed). It is noted that most plants have a "desludging recovery period" of 10 to 20 years but there is a group of plants that have a "desludging recovery period" of 2 to 5 years (Brighton, Oatlands, Richmond, Campania, Ouse, Bothwell, Bagdad, Swansea, Orford, Karanja, Bicheno, Hamilton, Kempton and Triabunna STPs). No explanation has been provided for these different recovery times. Other general supporting information would also have been valuable for assessment including the basis of and justification for the unit costs adopted, sludge concentrations, sludge volumes accumulated and a supporting narrative.

In summary, Jacobs considers that given the extent of the accumulated sludge backlog this operating expenditure is prudent but it is unable to effectively assess or establish whether the proposed expenditure is efficient. On balance Jacobs considers that the operating expenditure proposed should be adopted. However there is scope for extending some of the "sludge recovery" periods, and therefore reducing the associated sludge management expenditure for PSP2, if there are other pressures on TasWater's regulatory operating expenditure noting that TasWater has not demonstrated at this stage that the proposed sludge management expenditure is efficient.

Capital expenditure impacts

The operating expenditure estimates for 2015/16 – 2017/18 do not appear to take into account the impact of any additional expenditure arising from the proposed capital expenditure program. Jacobs notes the proposed program includes a series of water and sewage treatment plants being either constructed or upgraded, which have associated mechanical and electrical assets that will likely require additional power, chemicals and maintenance. No allowance appears to have been made for these operating costs.

Following the full review of the 20 sample business cases for the capital program (see **Section 3.3**), Jacobs has analysed the resulting operating expenditure impacts from the capital program that are detailed in the business case for each of the projects. Jacobs has not undertaken an in-depth review of these expenditures but rather has relied on the appropriate rigour being applied in the development of each business case and the supporting options and net present value assessments. Where the business cases have not detailed operating

expenditures, Jacobs has not been able to take them into account. **Table 18** summarises the operating expenditure for each capital project, including where this information is not available.

Jacobs does not consider that the operating expenditure associated with the water meter project should be taken into account given the project is an improvement / business efficiency project and will generate revenues which will recover the costs.

Table 18 – Operating expenditures resulting from capital projects – sample review projects (all values presented in \$2015)

No.	Service	Project/Program Description	2015/16	2016/17	2017/18	Total PSP2
			(Budget)	(Budget)	(Budget)	
TasWater projects to be taken into account						
1	Water	Tolosa Dam decommissioning	\$0	\$0	-\$206,301	-\$206,301
2	Water	Fingal WTP construction	\$56,477	\$57,889	\$59,336	\$173,702
3	Water	Flinders Island (Whitemark & Lady Barron WTPs)	\$0	\$155,800	\$160,925	\$316,725
4	Water	Ringarooma, Ledgerwood, Derby, Branxholm TW	NA	NA	NA	NA
5	Wastewater	Sewer Mains Renewals and CCTV	NA	NA	NA	NA
6	Wastewater	Brighton STP rationalisation	NA	NA	NA	NA
7	Wastewater	Kingborough sewerage strategy	\$0	\$0	\$257,782	\$257,782
8	Wastewater	Ti Tree Bend WWTP upgrade	\$401,921	\$423,292	\$445,832	\$1,271,045
9	Water	Small Towns Water Supply Strategy	NA	NA	NA	NA
10	Water	King Island Water Upgrade Program	\$116,895	\$204,021	\$213,685	\$534,601
11	Wastewater	STP Inlet Works Program	-\$18,246	-\$18,702	-\$19,170	-\$56,118
12	Water	Ouse & Hamilton Water Upgrade	\$46,957	\$48,131	\$49,334	\$144,423
13	Wastewater	Burnie Lion Trade Waste upgrades	\$86,979	\$208,920	\$245,817	\$541,716
14	Wastewater	Bridport STP upgrade and re-use	\$156,586	\$160,501	\$164,513	\$481,600
Subtotal (see Table 19)			\$847,569	\$1,239,853	\$1,371,755	\$3,459,177
TasWater / legacy regional organisation projects not taken into account						
15	Water	Ben Lomond Water's meter installation	\$1,422,557	\$1,458,121	\$1,494,574	\$4,375,253
16	Water	Westbury WTP	NA	NA	NA	NA
17	Wastewater	Wynyard WWTP	NA	NA	NA	NA
18	Wastewater	Rosebery WWTP and pipeline	NA	NA	NA	NA
19	Wastewater	Taroona Pump Station & Pressure Main	NA	NA	NA	NA
20	Water	Berriedale-Elwick Pipeline Duplication	NA	NA	NA	NA
Total			\$2,270,126	\$2,697,974	\$2,866,329	\$7,834,429

Jacobs has also examined these operating expenditures by cost components, as summarised in **Table 19**. It considers that in the main and on balance these costs are appropriate, but is concerned by the magnitude and lack of detail associated with 'Other' expenditures. As a result, it recommends that half of these 'Other' costs, as well as all other cost components be included in the expenditure estimates for 2015/16 – 2017/18. This results in additional operating expenditures of \$0.7M in 2015/16, \$1M in 2016/17 and \$1.3M in 2017/18.

Table 19 – Operating expenditures resulting from capital projects by cost components (all values presented in \$2015)

O&M adjustments by cost component	2015/16	2016/17	2017/18	Total PSP2
	(Budget)	(Budget)	(Budget)	
O&M cost adjustment - Labour	\$103,775	\$202,718	\$215,163	\$521,656
O&M cost adjustment - Power	\$469,942	\$565,236	\$850,172	\$1,885,350
O&M cost adjustment - Chemical	\$29,388	\$49,868	\$109,859	\$189,115
O&M cost adjustment - Materials	\$0	\$0	\$0	\$0
O&M cost adjustment - Other	\$244,464	\$422,030	\$196,561	\$863,055
Subtotal	\$847,569	\$1,239,853	\$1,371,755	\$3,459,177
Less a 50% reduction in 'other' costs	\$122,232	\$211,015	\$98,280	\$431,528
Recommended operating expenditure adjustments	\$725,337	\$1,028,837	\$1,273,475	\$3,027,649

Merger savings

Any potential future benefits from the merger of the three water authorities do not appear to have been incorporated into the operating expenditure estimates for the period 2015/16 – 2017/18. While TasWater states it has incorporated \$2.5M and \$5M included in 2013/14 and 2014/15, as noted in the previous section these are not apparent in the over expenditure relative to the Regulator's 2012 determination.

In its response to the draft report, TasWater noted that the audited savings for 2013/14 of \$2.7M. TasWater provided Jacobs with a copy of the independent report auditing the merger savings. This report confirms full year recurrent realisable savings of \$5.0M in 2014/15 as well as forecast, but not yet realised, savings of \$0.86M.

Recognising the full year recurring savings (realisable and forecast) from the merger, Jacobs considers that annual operating expenditure for the period 2015/16 – 2017/18 (set at \$154.9M as proposed in the previous section) should be reduced by \$5.86M.

Further operational efficiencies are likely over the PSP2 period as processes and systems are merged and streamlined and further staffing changes are made. It has been difficult for Jacobs to assess the magnitude of such efficiencies given the lack of sufficiently disaggregated operating expenditure information it has had access to. Although as outlined above, with reference to the National Performance Report median result for the combined water and sewerage operating cost per property, TasWater appeared to still have opportunities for improvement.

Jacobs considers that there are several ways in which TasWater could be incentivised to fully realise the further potential benefits from the merger:

- One option would be to not recognise any additional operating expenditure identified as flowing from the proposed capital program (following the further analysis noted above) and require TasWater to fund those additional costs through business efficiencies

- A further option would be to apply a best practice view in relation to corporate costs. Jacobs notes that as proposed TasWater's corporate costs make up 13% of its total cost base compared to industry best practice of around 10%. TasWater's costs could be set to trend towards this best practice view
- Another option would be to apply an 'efficiency dividend' or 'productivity adjustment' to future operating expenditure e.g. the 1% efficiency expectation applied by the Essential Services Commission to metropolitan Melbourne and regional Victorian water authorities.

Conclusions

As outlined above, given the lack of evidence and justification, Jacobs recommends that there should be no real increases in TasWater's operating expenditure for the period 2015/16 – 2017/18. That is, the proposed operating expenditure for 2013/14 (Jacobs recommended the Regulator's 2012 determination) should be maintained in real terms.

Given the information available Jacobs recommends that additional operating expenditure impacts associated with the proposed capital program are allowed. It has examined the business case documentation associated with the capital projects also reviewed in this report and determined that additional expenditures of \$0.7M in 2015/16, \$1M in 2016/17 and \$1.3M in 2017/18 are appropriate.

Recognising the full year recurring savings (realisable and forecast) from the merger, Jacobs considers that annual operating expenditure for the period 2015/16 – 2017/18 should be reduced by \$5.86M.

Finally, while it has been unable to form clear views on the extent of any further efficiencies which could be achieved from the merger, Jacobs notes that there are various mechanisms for incentivising the realisation of these benefits.

4.4 Issues and material themes

A number of issues have arisen in this review of TasWater's regulatory operating expenditure for PSP2 (and PSP1) that need to be addressed during the PSP2 period to ensure that TasWater has more extensive and robust information on regulatory operating expenditure included in its PSP3 document (and in its supporting information, explanatory material and narrative to justify the variations in regulatory operating expenditure in the PSP2 period and proposed for the PSP3 period). The majority of these are acknowledged by TasWater who has indicated an intention to achieve this during PSP2. These are outlined below.

An overarching issue for Jacobs in undertaking its review of TasWater's operating expenditure has been the distinct lack of information available for this purpose. The PSP includes a page and a half of information and despite issuing an extensive RFI, Jacobs has received limited additional information to assist in its review. Jacobs notes the contrast between this and the far more extensive amount of information that has been provided in relation to the proposed capital program.

Jacobs appreciates that TasWater is a recently formed business and still developing its systems, processes and capabilities, however, in the same way that capital expenditure is important to the financial sustainability of the business, and ultimately over future regulatory periods water and sewerage prices, so is operating expenditure. It would appear to Jacobs that moving forward the operating expenditure planning process should be a key focus for the business as well as its ongoing processes around monitoring, managing and reprioritising operating expenditure.

Other key issues which Jacobs has observed during its review are as follows:

- There appears to be limited information, ability or capability to explain the key drivers and reasons for changes in operating expenditure and to substantiate that narrative with documented evidence. For example, in explaining the drivers behind increased materials and service expenditure, a backlog of de-sludging activities is not considered to be sufficient explanation. Rather the impact should be linked back to either a strategy or an operational plan which has been developed to manage the issue in an optimised manner over time, including with a view to operating expenditure impacts

- In a related sense, there does not appear to be strong linkages between the capital and operational planning processes and the operating expenditure planning process. Jacobs can see no clear signs that the impacts of either the capital or operations and maintenance planning processes have been incorporated into the operating expenditure in a systematic manner
- Further, it is unclear how operating expenditure has been linked to service level requirements and outcomes, which should be the key drivers of expenditure
- While TasWater has proposed the incorporation of its current view of the benefits from the merger, there is no ongoing drive for future benefits in terms of additional operating expenditure reduction targets. This is also reflected by the absence more generally of an ongoing operating efficiency target
- There appears to be limited understanding of the difference between the financial and regulatory treatment of operating expenditure items, including the removal of non-cash items such as depreciation and interest costs for the purpose of establishing regulated expenditure.
- Further, the statutory operating expenditure limit set by the Regulator in its 2012 determination does not appear to be a key factor in TasWater's operating expenditure planning or reporting. Jacobs expects that moving forward TasWater would include in its PSP detailed information around its performance against the statutory operating expenditure limits, including explanations of the reasons for any variances. This should also be linked to the levels of service and service standards being provided by TasWater and exist for business segments and activity areas and clearly differentiate between regulated and unregulated expenditure. The introduction of internal management quarterly reporting for business segments and activity areas against the statutory limits determined by the Regulator could occur to assist TasWater in monitoring its performance against PSP benchmarks and budgets and understand key drivers of changes
- In addition, regulated and unregulated expenditure while potentially understood are not always clearly differentiated leading to potentially inconsistent and non-comparable information
- Similarly, there appear to various views of expenditures from different source, particularly in terms of actual expenditure as reported for various purposes. There should be an ability to reconcile these different views.

5. Recommendations Impact

Through this review, Jacobs has had regard to the impact of the proposed expenditure and this review's findings on TasWater's business, its customers and its prices.

Jacobs recognises that for PSP2 prices are more likely to be determined by price constraints than by proposed expenditure limits, and so there will likely be limited impact on TasWater's business and its customers as a result of the findings of this review. TasWater has a significant program of compliance-driven capital expenditure ahead, which will have a causal impact on operational expenditure that will be needed to operate and maintain the new infrastructure.

However, TasWater's corporate asset management systems and business processes that enable the planning, delivery, monitoring and reporting of its capital and operating expenditure needs significant attention to achieve a level of robustness that would be expected of a mature water utility in Australia – for its internal business processes and for its regulatory submissions.

TasWater does have a strong commitment to improve its systems and processes, and it is hoped that this review will provide some useful guidance on areas where TasWater can focus its improvement efforts ahead of its regulatory submission in three years for PSP3.

Appendix A. Definition of Key Terms

Prudency Test

Expenditure is considered to be prudent if it:

- could be reasonably expected or required by an operator exercising good industry practice; or
- if it is consistent with delivering the required service levels, outputs and obligations over the relevant regulatory period.

Prudent expenditure should also take into account a planning horizon that extends beyond the relevant regulatory period. The Prudency Test assesses whether, in the circumstances existing at the time, the decision to invest in an asset is one that a regulated entity, acting prudently, would be expected to make.

In assessing prudency, one should therefore assess whether, given the circumstances facing the relevant regulated entity at the time the decision was made, a prudent operator would choose to undertake the program or project in a similar manner, in terms of size, scale or scope having regard to the opportunity cost of not investing in the program or project.

Efficiency Test

Efficient expenditure is considered to be the minimum level of expenditure that is required to deliver the desired outcome or result consistent with an operator exercising good industry practice. The Efficiency Test should examine whether TasWater's proposed expenditure represents the best and most cost effective way of meeting the community's need for the relevant services.

In assessing efficiency, one should therefore assess whether, given the circumstances facing the relevant regulated entity at the time the decision was made, an efficient operator would have spent the same amount of money or utilised the same procurement process to undertake the program or project.


The Regulator will use the results from applying the Efficiency Test to determine how much of TasWater's proposed asset values, operating and capital expenditure for the upcoming regulatory period will go into its determination of TasWater's revenue limits.

Appendix B. Detailed reviews of sample CAPEX projects

B.1 Tolosa Dam decommissioning (and replacement with tanks)

Project Name	Tolosa Water Supply Upgrade
Primary Driver	Compliance
Organisation	TasWater
Service	Water
Project Type	Proposed
Jacobs Review Number	Project 1

TasWater proposed CAPEX Budget (nominal)							
FY12/13	FY13/14	FY14/15	FY15/16	FY16/17	FY17/18	Beyond	Total
-	-	\$2.53M	\$9.05M	\$12.37M	-	-	\$23.95M

Project Description		
<p>The Tolosa Dam wall does not meet current safety standards (ANCOLD Guidelines) for operation at full supply levels. The spillway capacity is undersized for its catchment and in extreme events would cause overtopping of the dam wall. The Portfolio Risk Assessment has identified that if the dam fails it could cause loss of life and damage to the major business district of Glenorchy.</p> <p>The primary driver for the Tolosa Water Supply Upgrade is to lower the Extreme Hazard Rating of Tolosa Dam such that the Dam is within the Limit of Tolerability for existing Dams according to the Australian National Committee on Large Dams (ANCOLD) Guidelines on Dam Safety Management or alternatively, to remove the Dam from service and provide water storage in the form of tanks.</p> <p>The proposed solution is the construction of two tanks with a combined storage of 40 ML and associated infrastructure including a new pump station and a chlorination station and the decommissioning of the Tolosa Dam.</p>		
Is the project prudent?	Jacobs Assessment:	
<p>Jacobs finds that this project is prudent on a needs basis. It is aligned with TasWater's key drivers and obligations, and could be reasonably expected by an operator exercising good industry practice given the circumstances of TasWater at the time the decision was made.</p> <p>Project need: TasWater recognises that the Tolosa Dam has an <i>Extreme</i> Potential Loss of Life Estimate. It is currently ranked 2nd in TasWater's July 2014 Dam Safety Management Plan (the top ranked dam, Limekiln Gully Dam, is currently under restricted operation and has also been programmed for decommissioning, exact timeframe yet to be finalised by TasWater). TasWater aims to lower the Extreme Hazard Rating of Tolosa Dam such that the Dam is within the Limit of Tolerability for existing Dams according to the ANCOLD Guidelines on Dam Safety Management. The Water Management (Safety of Dams) Regulations 2011 requires TasWater to comply with the ANCOLD guidelines.</p> <p>Cost driver allocation: Jacobs agrees that compliance is the primary cost driver for this project, aligned with the Ring Fencing Guideline. TasWater aims to lower the Extreme Hazard Rating of Tolosa Dam such that the Dam is within the Limit of Tolerability for existing Dams according to the ANCOLD Guidelines on Dam Safety Management.</p> <p>Project timing: The inclusion of the project within the PSP expenditure program is consistent with TasWater's risk-based capital prioritisation process. The project business case was developed and approved by the Board in April 2014. Tolosa Dam is identified as having an extreme consequence category in TasWater's 2013/14 Dam Safety Management Plan Annual Progress Report. [REDACTED]</p> <p>Planning horizon: TasWater states that the storages were sized to meet peak day flows, as determined from historical SCADA data, and in accordance with the TasWater Supplement to Water Supply Code of Australia WSA 03-2011-3.1 MRWA Edition V2.0. In response to an RFI, TasWater stated:</p>		

“Historical Peak Day Demand was found to be 25ML-30ML for the zone. There has been a tendency for reduced flows due to a number of factors over recent years including installation of water meters, relatively wet summers and the trend towards water efficient appliances being the norm. It is difficult to determine the effect of any of these in isolation; however, the net effect has been determined to be for a reduction in overall zone demand. This has been paired with a small amount of expansion and re-development which includes the largest industrial area in Tasmania and uncertainty around possible future water use. Overall, the demand has been assessed as likely to remain relatively constant, and as such historical consumption data provides an appropriate basis for estimating future demand.”

The Business Case identifies Nyrstar, an integrated mining and metals business, as TasWater's largest customer with a demand of up to 10 ML/day. In response to the RFI clarifying the tank sizing, TasWater states:

“Nyrstar have established alternative supplies of water for their facility which supplement flows from TasWater. They have also advised that their flow from TasWater is required at the same rate as these alternative supplies are less reliable than that from TasWater.”

It is noted that a storage volume of 40 ML was adopted based on aligning with the Glenorchy Planning Scheme and meeting the storage needs of the system during an upstream system outage.

No additional supporting evidence has been provided to Jacobs to confirm the robustness of the demand estimates that have been used to size the infrastructure. However, Jacobs considers the approach adopted to be appropriate.

Deliverability: The Business Case indicates that the works will be undertaken over the 2014/15 to 2016/17 financial years with all works to be completed by 30 June 2017. Jacobs considers the time allowed to undertake the various components of work to be reasonable. In response to the RFI, TasWater indicated that although the land acquisition process is slightly behind schedule, the development approval process is ahead of schedule and at completion, with both processes likely to be completed by the end of calendar year in effect putting the project ahead of schedule.

Is the project efficient?

Jacobs Assessment:



Based on the evidence provided, Jacobs finds that the expenditure currently proposed to be efficient and consistent with an operator exercising good industry practice.

Options assessment and selection of the preferred option: The options discussed within the business case include the preferred option and the option refinement only. The Business Case states that the preferred option is that which was identified in the 'Tolosa Dam - Preferred Option Update' paper from May 2011. This paper has not been provided to Jacobs. The Business Case states that a number of alternatives were identified in the paper, including: a cut down dam, storage tanks within the dam footprint and storage tanks on land to the North of the existing dam. In response to the RFI TasWater states:

“As the size of the storage required is quite large, the initial assessment of the options reduced the number of possible options significantly. For example, construction of tanks within the dam footprint was ruled out due to the risks associated with the foundations and the extended period of time with no storage provided. Options for dam remediation works such as additional downstream filter buttress that did not include a cover and liner were eliminated due to the unaddressed risks in regard to water quality (secondary driver).”

A cost and NPV comparison was undertaken for the 'do nothing', cut down dam/liner/cover, and construction of tanks on land to the south of the existing dam options with the last mentioned option being the preferred option. Jacobs notes that the capital cost and NPV of the preferred option is slightly higher than the Cut Down Dam/Liner/Cover option. When queried on how the preferred option was selected TasWater stated:

“The two options assessed had very close NPV with the preferred option slightly more costly. However, as the amenity of the park is of significance to the community a covered dam was not considered to be an acceptable solution to the community.” Jacobs supports this decision given that there is less than \$200,000 difference in the initial capital costs of these two options.

TasWater states the cost estimates have been developed from historical rates, independent cost estimates (including budget price estimates for tank storages from VSL and also by Saunders International who have recently completed storage tanks of similar sizes in Victoria) and bottom up estimation. Jacobs has not sighted any supporting documentation to verify this.

A contingency allowance of 30% was included in the cost estimates. Jacobs understands that this is standard for Gate 2 business cases.

Jacobs considers that the methodology used for the selection of the preferred option and the development of the budget cost estimate to be appropriate. Jacobs understands that all of the works will be tendered and therefore market tested.

Procurement approach: The Business Case indicates that the project will be implemented using a design and construct model with two packages of work; one for the construction of the tanks, pump station, chlorination station, pipelines and PRV Station and one for the decommissioning of the dam. This division of works packages is reasonable. No further details have been provided by TasWater at this stage of the project development.

Recommendations

Jacobs finds that this project is prudent on a needs basis. It is aligned with TasWater's key drivers and obligations, and could be reasonably expected by an operator exercising good industry practice given the circumstances of TasWater at the time the decision was made.

Based on the evidence provided, Jacobs find that the expenditure currently proposed to be efficient and consistent with an operator exercising good industry practice. No adjustments to capex for this project or the expenditure profile are proposed.

Assumptions

None

Reference Documentation


Jacobs has relied on the following documentation in our review:

- Tolosa Water Supply Upgrade - Business Case, Version 01, TasWater, 31 April 2014
- TasWater Response to Jacobs RFI-13 CAPEX - Project 1 Tolosa, TasWater, 24 October 2014
- TasWater Dam Safety Improvement Program, V1.0, TasWater, 28 January 2014
- Dam Safety Management Plan - Annual Progress Report - FY13/14, TasWater, July 2014
- Tolosa Decommissioning NPV and Cashflow spreadsheet, TasWater, undated
- TasWater Supplement to Water Supply Code of Australia WSA 03 -2011-3.1 Version 3.1 MRWA Edition V2.0, Issue Number: DRAFT 03

B.2 Fingal WTP construction

Project Name	Small Towns Water Treatment Program – Fingal
Primary Driver	Compliance
Organisation	TasWater
Service	Water
Project Type	Current
Jacobs Review Number	Project 2

TasWater CAPEX Budget (nominal)							
FY12/13	FY13/14	FY14/15	FY15/16	FY16/17	FY17/18	Beyond	Total
Breakdown not provided (cost from business case)							\$3.5M

Project Description		
<p>This project was undertaken by Ben Lomond Water and involved upgrading the water treatment plant at Fingal, located 75 km SE of Launceston.</p> <p>The major components of the project are set out below:</p> <ul style="list-style-type: none"> Upgrade to pump station mechanical and electrical equipment and new pump station building A 2.6 kilometre rising main to convey raw water from South Esk River to the pump station A raw water storage tank A water treatment plant and associated infrastructure and a clearwater storage and chlorine contact tank situated on the side of a hill at an elevation approximately 25 metres above the existing weir on Fingal Rivulet A 0.5 kilometre treated water delivery main which will convey treated water to the distribution network in Fingal town. <p>The upgrade replaced the primary water supply to the town from Fingal Rivulet to South Esk River for the following reasons:</p> <ul style="list-style-type: none"> The weir used to supply untreated water from Fingal Rivulet was constructed in 1950, in poor condition and in a location that was difficult to access Water supply from Final Rivulet was less reliable than the South Esk River as it could run dry for up to six weeks during the dry summer period. During these periods of peak demand and disrupted supply, water would need to be pumped from the South Esk River into the reticulated system via the existing weir. 		
Is the project prudent?	Jacobs Assessment:	
<p>Jacobs considers this project is prudent on a needs basis. It is aligned with TasWater’s Small Towns Water Supply Strategy, reflects DHHS compliance requirements (it is a priority project) and could be reasonably expected to be undertaken by an operator exercising good industry practice.</p> <p>Project Need: Water supplied to the town of Fingal has been untreated and under a permanent Boil Water Alert for an extended period. It was identified by the DHHS as a system having a high risk of bacteriological contamination, as being non-compliant with the Australian Drinking Water Guideline and overall as a high priority project (Priority 1). Based on the State wide risk assessment, the high priority against compliance reflects:</p> <ul style="list-style-type: none"> Permanent boil water alerts Recent E-coli detection High occurrence of metals in treated water. <p>This represents a clear regulatory need for TasWater to take action to address the non-compliances. Jacobs agrees that the ‘do nothing’ solution is not acceptable.</p>		

Cost driver allocation: TasWater has classified this project's primary driver as compliance growth and Jacobs agrees with this approach.

Project Timing: The inclusion of the project within the PSP1 expenditure program is consistent with TasWater's risk-based capital prioritisation process, noting TasWater's decision to continue with the delivery of compliance commitments made by its legacy regional organisation. The project business case was initially developed by Ben Lomond Water and approved by the then BLW Board in November 2011. Requests for tenders were advertised by Ben Lomond Water on 20 October 2012 and the detailed tender assessment completed on 27 February 2013.

Is the project efficient?

Jacobs Assessment:



It is Jacobs' opinion that the selection of the preferred option is consistent with an operator exercising good industry practice, and while not the least cost option in the commercial tender process, there was a well-structured approach to the multi-criteria analysis which resulted in this decision. Further, Jacobs notes that by tendering the Fingal and Bracknell water treatment plants jointly the cost was around \$0.8M lower than the Board had approved for the two projects separately.

Options Assessment and selection of the preferred option: The options assessment discussed within the business case considered three options, one of which was the 'do nothing' option. The other two options were the provision of rainwater collection tanks and the provision of treated water with a filtered turbidity target of 0.1NTU. The 'do nothing' and the rainwater collection tanks were not considered further as they would not meet the DHHS compliance requirements. The business case also notes that consideration was given to the possibility of supplying treated water from an existing water supply system that was in reasonable proximity to Fingal. However, given the closest treated water supply was at St Marys, which was 22km from the clearwater storage site, this was not considered feasible given the significant cost and it was not investigated further.

The business case also notes that membrane water treatment technology was likely to be the most efficient means of filtration based on raw water quality, the volume of water to be treated, the filtered water turbidity target and the minimum level of operator input required. During the tender process this was tested through a technology assessment, including calculation of project life cycle costs, comparing In-Filter Dissolved Air Flotation (DAFF) and membrane filtration. As a result of this assessment the DAFF technology was determined to be preferred as it can achieve all of the water quality and process guarantees, is a proven water treatment process technology, and was ranked first out of the three options in the quantitative assessment.

Sizing of the options: SKM was engaged to undertake the investigation and feasibility design report for Fingal water treatment plant. As a part of this report it investigated the treatment plant sizing, noting that it is accepted practice to size the plant's treated water production capacity to equal peak daily demand. Projected demands were calculated using the current tenement data multiplied by the agreed unit flow parameter and an allowance for 1% per year population growth. Jacobs considers that the approach adopted is appropriate, although it notes that the assumed population growth is higher than that included in TasWater's PSP.

Cost estimates and procurement approach: The cost estimates for the water treatment plant were tested via a commercial tender process. Six quotes were received by the closing date of 21 November 2012 and in the first of its six stage process two tenders were short-listed [REDACTED]. During the detailed tender assessment stage, the tenders were reviewed against the contract technical specifications and the Functional Requirements Specification, a multi-criteria quantitative assessment considering financial and non-financial criteria was undertaken as well as the risk assessment. In relation to the multi-criteria assessment, while the cost of the preferred tender was higher than the other tender, taking into account other criteria (knowledge / appreciation of the project, methodology, key personnel, technical capability, safety, environment, the financial and organisational structure of the tendering organisations and reference projects) it was the preferred option. Jacobs reviewed this analysis and considered it to be well-structured and robust.

[REDACTED]

The pump station and rising main pipeline were also subject to commercial tender processes.

Jacobs has reviewed the commercial tender documentation and is satisfied with the rigour applied in order to achieve an efficient outcome.

The costs commercially negotiated that are associated with the three components of this project are outlined in the table below.

Project costs for the Fingal water treatment plant

Project component	Capital expenditure (\$M)
[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]
Total	5.261

Recommendations

Jacobs considers this project is prudent, reflecting the DHHS compliance requirements (it is a priority project) and is consistent with the Small Towns Water Supply Strategy. It also is of the view that the project's costs are efficient, and while not the least cost option in the commercial tender process, there was a well-structured approach to the multi-criteria analysis which resulted in this decision. Further, Jacobs notes that by tendering the Fingal and Bracknell water treatment plants jointly the cost was [REDACTED] lower than the Board had approved for the two projects separately.

Assumptions

As the final stand-alone costs for the Fingal water treatment plant are not clear (a cost of \$2.6M is in the detailed assessment report before any adjustments for discounts negotiated) the project is assumed to have cost \$3.5M [REDACTED]

Reference Documentation

Jacobs has relied on the following documentation in our review:

- Ben Lomond Board Meeting Report (4 November 2011)
- Bracknell and Fingal WTPs – Detailed Tender Assessment Report (Final Report, 27 February 2013)
- Design and Construction of Water Treatment Plants at Bracknell and Fingal Contract 2012/36 Tender Assessment Report
- Fingal Raw Water and Treated Water Pipelines Contract 2012/38 Tender Assessment
- Short Street Pump Station Upgrade Fingal Contract 2012/39 Tender Assessment
- Fingal Water Treatment Investigation, Feasibility Design and Implementation report (SKM March 2011)

B.3 Flinders Island Project (new WTPs at Whitemark & Lady Barron)

Project Name	Flinders Island Water Supply System Improvement
Primary Driver	Compliance
Organisation	TasWater
Service	Water
Project Type	Proposed
Jacobs Review Number	Project 3

TasWater proposed CAPEX Budget (nominal)							
FY12/13	FY13/14	FY14/15	FY15/16	FY16/17	FY17/18	Beyond	Total
-	-	\$0.76m	\$10.22m	-	-	-	\$10.98m

Project Description		
<p>The project involves constructing two water treatment plants - at Whitemark and Lady Barron on Flinders Island. The existing reticulated water schemes at these towns do not currently comply with Australian Drinking Water Guidelines (ADWG). Whitemark's water supply has 186 connections and has been subject to 'Do Not Consume' notices since May 2011 due to the lead concentrations regularly exceeding ADWG health limits. Lady Barron's water supply has 138 connections and is currently subject to a permanent Boil Water notice.</p> <p>Based on the business case prepared for Board approval in June 2014, the proposed works will include:</p> <ul style="list-style-type: none"> • 60ML raw water storage at Whitemark • Two water treatment plants (WTPs) with raw water pump stations and clear water storage tanks and treated water transfer pump stations • New spear bores at Lady Barron • A 500kL treated water reservoir at Whitemark <p>Based on the draft options assessment report, at Whitemak, water will be sourced from the South Pats river and pumped by the South Pats River Pump Station up to the Cannes Hill Reservoir. Raw water would be gravity fed through water storages and on to the WTP, before being pumped to the adjacent steel reservoir. At Lady Baron water from the existing bore field site would be treated by a new WTP and then pumped to the existing Vinegar Hill reservoir.</p>		
Is the project prudent?	Jacobs Assessment:	

Jacobs finds that investment in water treatment at Whitemark and Lady Barron is prudent. However the business case would benefit from further information to establish the rationale for some of the proposed works which appear to include renewal of existing infrastructure (e.g. pumps) and water supply infrastructure (e.g. raw water storage).

Project Need: Neither Whitemark nor Lady Barron water supply quality complies with ADWG standards. As shown in the following tables providing measurements undertaken by TasWater, the elevated concentration of lead in Whitemark Water appears to represent a significant health risk (although the extent of supporting data is quite limited) whilst the other parameters (colour, aluminium, iron) are aesthetic and therefore not as high priority.

[REDACTED]			
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]

[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]

Both towns have been included on the DHHS priority list for drinking water supply systems from a public health perspective. Whitemark has been ranked as Priority 1 and Lady Barron and has been ranked as Priority 2. TasWater has a regulatory obligation to comply with ADWG and as such, it is considered prudent to improve the drinking water quality for both towns at some stage. However it is clear that from a public health risk perspective, an upgrade at Lady Barron is less urgent than at Whitemark and therefore the need for investment is not as strong.

Despite the differences in the DHHS prioritisation, Jacobs recognises that there may be some efficiency in undertaking these two projects at the same time due to the remoteness of the catchments. Also, Jacobs recognises that other social and government drivers are at play which may warrant Lady Barron’s Water Treatment being upgraded at the same time as Whitemark’s. As such, Jacobs considers it prudent to provide water treatment at both towns contemporaneously.

Jacobs notes that the cost estimate provided in the NPV analysis includes new infrastructure for raw water sources – including dam works, pump stations and raw water tanks which have not been discussed in any detail in the business case. More substantive rationale for these works should be provided to demonstrate prudence. For example, the business case notes that “Ancillary structures such as the two pump stations, dams and bores are not to TasWater standards and require upgrading” but this needs to be substantiated with further evidence. From the information provided, it is not clear which standards are not being complied with, the age of the existing assets relative to their useful life, or the urgency of the upgrade. For the purpose of this assessment, TasWater’s advice that the raw water pumps require upgrading are considered to be reasonable, though it would be expected that future submissions are supported with more robust evidence.

In its response to the draft report, TasWater also pointed to the following as evidence for the need for new raw water storage:

- The “Flinders Island Water Supply Systems Treated Water Options Report Dec 2014” (2013) details that South Pats River dries up in summer
- One of the criteria used to size the infrastructure requirements in the “Flinders Island Water Supply Systems Treated Water Options Report Dec 2014” (2013) refers to surface water sources requiring a raw water storage dam equivalent to the annual design demand. This is to accommodate dry years, reduction in available storage volume over time due to sedimentation, and to provide stable raw water feed quality.
- The MJM Environmental report “Flinders Island Treatment Options Assessment” summarises the South Pats River flows for 1980-1990 measured at gauging station 1200, located approximately 1.2 km downstream of the Pats River Dam. The results show that there are periods of no flow ranging from several hours to several days which typically occur during the months of October – April (coinciding with periods of higher daily water usage rates).

While the above provide some background to the issues considered, they do not provide string evidence for why additional storage works are essential to the project.

Planning Horizon: Insufficient evidence has been provided to Jacobs to confirm the robustness of the growth and demand estimates that have been used to size the infrastructure for the 30 year horizon. The business case makes an allowance for 0.6% population growth per annum. It is recognised that this growth rate is based on the then regional (Ben Lomond Water) growth factor and that the business case was completed before the PSP2 average growth rate of 0.5% was developed. However there is insufficient information available to explain why a higher population growth rate than the average is justified, particularly when the population on Flinders Island declined by nearly 10% between 2006 and 2011 and by 3.5% between 2001 and 2006. .

Timelines: The project timelines appear reasonable.

Is the project efficient?

Jacobs Assessment:



It is Jacobs’ opinion that the cost estimate included in the business case is not based on a sufficiently detailed and robust definition of, or justification for, the project scope and scale. Firstly, the business case and cost estimate were completed prior to the more detailed assessment of technology options for the water treatment plants. Secondly, and considered to have a greater impact on cost, the scope allows for an annual population growth of 0.6% despite the region’s population declining annually by an average of 1.3%.

Options assessment and selection of the preferred option: A very high level options assessment is captured in the business case comparing four options - Option 1: "Do Nothing"; Option 2: Single water treatment plant and pipeline for the two towns; Option 3 (preferred): Two separate water treatments plans; and Option 4: Upgrade of Whitemark supply only. Although Jacobs supports Option 3 as the preferred option, the process used to select the preferred option has the following shortcomings:

- The business case refers to a 'detailed report and analysis of options prepared for this business case' but the Options Assessment Report prepared by TasWater is still in draft format with many sections incomplete, including the Options Assessment and Recommendation sections. TasWater has advised that this Options Report (2013) has informed the business case, but that it has not been finalised.
- A detailed assessment of the water treatment options was completed by MJN Environmental on 3 April 2014, after the business case was already approved. This report considers different technologies available for water treatment in some level of detail and recommends that subject to successful jar testing, that the conventional treatment with pre-filtration chlorine is adopted at both WTPs. This recommendation or alternative technology options have not been directly captured in the business case options assessment, scope or cost estimate.

Based on TasWater advice, it is understood that detailed investigation and costing of the treatment technology was not required within the scope of Gate 2 of the TasWater's Project Management Framework and that "generic assumptions regarding cost were appropriate and necessary". Although this level of information may be sufficient for the Board's business case consideration and approval, further certainty about the option and cost estimate is required for the purposes of establishing an efficient price path. As discussed in more detail below, the project cost can vary by 5% depending on the technology selected. The technology selected will also have an impact on the ongoing operating costs. As such, it is advised that this information be captured as part of future business cases.

Project scope and sizing: Jacobs considers that the business case and supporting information should provide more robust justification of the selection of the water treatment process technology adopted and the size of the WTPs needed. As mentioned above the scope allows for population growth of 0.6% per annum, and TasWater has not provided background to support this higher number compared with the average 0.5% adopted in TasWater's Draft PSP2. More importantly, this assumed population growth is at odds with the population decline at Flinders.

The following table provides the population decline in Flinders Island based on ABS Data, demonstrating that since 2001, the population on the island has declined by an average of 1.3%.

	2001	2006	2011	Average annual % growth 2001-2011
Flinders Island population	864	835	755	-1.35%

Project Costing: TasWater has provided a detailed capital cost spreadsheet covering in excess of approximately 100 line items categorised as follows:

- Raw water sources
- Treatment
- General
- Treated water transfer
- Storages

TasWater has advised that unit rates and quantities for each line item have been estimated by GHD but documented evidence of the accompanying scope description has not been provided. Jacobs understands that the costs allow for generic scope assumptions. For example, and most importantly, the water treatment costs do not assume a specified technology but are based on a generic technology which may have a significant impact on cost. In the MJN Environmental Water Treatment Options report (completed after the cost estimates for the business case were developed), the water treatment plant costs at Whitemark ranged from \$2.53 million to \$3.08 million. Although the difference in these costs is only approximately 5% of the total proposed project cost, it is a 22% difference for that project component and significant in quantum.

In its response to the draft report, TasWater noted that whilst a like for like comparison was difficult, MJN Environmental's cost estimate "provides a useful check that the total project cost estimate completed by TasWater/GHD are reasonable." Jacobs has summarised the comparison of the two estimates based on the information available. Whilst this is a very high level comparison, it appears that the cost estimates are within 5.1% of each other (2.6% of total project cost). This difference is considered to be within an acceptable range of accuracy.

The key concern about the cost estimate relates to the projected population growth of 0.6% per annum. With historic population at Flinders declining, this assumption will likely lead to over-design and a higher cost for TasWater customers.

Jacobs also notes that the cost estimates for Whitemark water treatment under Option 3 and Option 4 are the same. Jacobs would expect economies of scale to be realised under Option 3 if works and Whitemark and Lady Barron are procured as a single contract. Whilst there is insufficient information available at this stage to estimate a cost savings, Jacobs recommends that opportunities for economies of scale should be reflected in future cost estimates.

Procurement Approach: The business case does not detail the procurement approach and TasWater has separately indicated that this is not a requirement for Gate 2.

Recommendations

Jacobs recommends that the project cost should be amended to reflect the likely decline in population.

In response to the above, Jacobs recommends adjusting the project scope and cost to reflect zero population growth at both Lady Barron and Whitemark. Based on available information, this would involve adjusting the following input assumptions in TasWater's NPV model:

	Kl/day in current TasWater cost spreadsheet	Recommended Kl/day based on 2013/14 demand (extracted from MJM Environmental, 2014)
Whitemark AD	165	138
Whitemark PD	371	310
Lady Barron AD	123	88
Lady Barron PD	276	198
Total AD	288	226
Total PD	647	508

Applying the above recommendations to TasWater's NPV spreadsheet for the project reduces the capital cost from \$10.979 million (nominal) to \$10.708 million (nominal). This also reduces the operating costs from \$144,000 per annum (real) to \$141,000 (real).

The adjusted cashflow is summarised in the following table

	2014/15	2015/16	2016/17	2017/18	2018/19
Capex (nominal)	\$757,000	\$9,951,000	-	-	-
Opex (nominal)			\$149,000	\$153,000	\$158,000

Jacobs also makes the following general recommendations for TasWater to consider for future PSP submissions:

- Business cases should be based on more detailed options assessments and feasibility assessments. It is recognised that in some cases, business cases will be based on draft reports and studies. However these studies should be finalised prior to submitting the PSP, and any updated information should be reflected in a revised scope and cost estimate;

- All business cases should include justification for all components of the project. For the Flinders Island Project, the only rationale provided was in regards to water quality. More emphasis is needed on providing evidence for the works/facilities driven by renewal and growth needs;
- The costs captured in the PSP should be based on more detailed scoping of the preferred option. For water treatment projects, this should include sufficient detail about the type of technology applied;
- Cost estimates should consider opportunities for economies of scale savings. This is particularly important when comparing options of varying scale.

Assumptions

It is assumed that the draft Options Assessment dated December 2014, but referenced on TRIM as December 2013, was used to inform the options assessment in the business case

Reference Documentation


List relevant documentation used in the review:

- Flinders Island Water Supply System Improvements Business Case (Version 0.3)
- NPV analysis spreadsheet/ Detailed cost spreadsheet
- TasWater Flinders Island Water Supply Systems Treated Water Options Report (December 2014)
- MJM Environmental Flinders Island Treatment Options Assessment (27 October 2014)
- Capital Works Program PSP Version
- TasWater response to project assessment (2014)

B.4 Ringarooma, Ledgerwood, Derby, Branxholm provision of treated water

Project Name	Ringarooma Valley Regional Treated Water Scheme
Primary Driver	Compliance
Organisation	TasWater
Service	Water
Project Type	Proposed
Jacobs Review Number	Project 4

TasWater proposed CAPEX Budget (nominal)							
FY12/13	FY13/14	FY14/15	FY15/16	FY16/17	FY17/18	Beyond	Total
-	\$0.38M	\$5.57M	\$3.64M	-	-	-	\$9.59M

Project Description		
<p>The aim of the Ringarooma Valley Regional Treated Water Scheme (RVRTWS) is to provide treated water in full compliance with Tasmanian Drinking Water Quality Guidelines (TDWQG) – which are consistent with ADWG guidelines – in particular for health related parameters and limits, to the towns of Branxholm, Derby, Legerwood and Ringarooma via a common water treatment plant and interlinking trunk water pipelines.</p> <p>The recommended option includes sourcing of raw water from the Upper Ringarooma Irrigation Scheme (URIS) operated by Tasmanian Irrigation (TI), a water treatment plant located in the vicinity of TI's Cotton Bridge Pump Station, booster stations at Ringarooma and Derby, treated water reservoirs and disinfection booster stations at Branxholm and Derby and transfer pipelines.</p>		
Is the project prudent?	Jacobs Assessment:	
<p>Jacobs finds that this project is prudent on a needs basis. It is aligned with TasWater's key drivers and obligations, and could be reasonably expected to be undertaken by an operator exercising good industry practice given the circumstances of TasWater at the time the decision was made.</p> <p>Project Need: TasWater and the DHHS recognise that treated water in full compliance with TDWQG health limits is not currently provided to the townships of Branxholm, Derby, Legerwood and Ringarooma. All four towns are included on the DHHS Priority List for 2014, with all ranked as Priority 1 except Legerwood which was Priority 3. This represents a clear regulatory need for TasWater to take action to resolve these non-compliances. Jacobs agrees that the 'do nothing' solution is not acceptable.</p> <p>Cost Driver Allocation: Jacobs agrees that there are multiple cost drivers for this project aligned with the Ring Fencing Guideline – including compliance and business efficiency. It is Jacobs' opinion that the primary driver is compliance. See Section 3.5 of this report for further discussion about cost driver allocations.</p> <p>Project Timing: The inclusion of the project within the PSP2 expenditure program is consistent with TasWater's risk-based capital prioritisation process. The project business case was initially developed in early 2013 and approved by the Board in July 2013. It is noted that an updated approach for this project was provided to the Board on 6 August 2014 for approval involving a fundamental variation in project approach, namely to pursue the option to source raw water from the URIS with TI, without increase to the approved budget. No details of this variation or its approval has been sighted by Jacobs, but it is understood that Board approval to proceed was given.</p> <p>Planning horizon: Insufficient evidence has been provided to Jacobs to confirm the robustness of the growth and demand estimates that have been used to size the infrastructure. In terms of water demand, the Options Report states:</p> <p><i>"Flow meters are installed for the Ringarooma, Legerwood, Branxholm and Derby supplies. However, demand data is not considered accurate as the reliability of the metered flows in some cases is unknown, with data gaps in the information available to date. In the Small Towns report, the annual demand was based on 400 kL/year/tenement. Following implementation of meters at Ringarooma, Legerwood, Branxholm and Derby it is expected that demand will be below this figure. Therefore, further consideration of the peak demand is required prior to design of supply/treatment systems."</i></p>		

Peak daily demand was identified as the product of average daily demand and a peak daily factor, as discussed in the Southern Water (SW) supplement to the Water Supply Code of Australia (WSA). According to the supplement, for towns serving populations less than 2,000 people, peak daily demand per connection of 2,325 litres was adopted."

Jacobs considers that the use of an annual demand of 400 kL/year/tenement was appropriate at the time but considers that it would be appropriate to review the current actual measured demand using the installed flow meters. Jacobs has not seen any evidence of the "further consideration of the peak demand... prior to design of supply/treatment systems" being taken into account in confirming or revising project needs.

The Options Report adopts a demand growth rate of 1% per annum over a 25 year period based on Census data from 2006 and 2011 for Ringarooma, Legerwood, Branxholm and Derby. Jacobs notes that this is inconsistent with the state-wide average of 0.5% p.a. provided within the Draft PSP2 and has not been separately justified.

The peak daily demand, in 25 years, for Ringarooma, Legerwood, Branxholm and Derby was estimated to be 1.4 ML/day, based on a population of 469 tenements and the above assumptions.

Deliverability: The Business Case indicates that the works will be undertaken over the 2013/14 to 2015/16 financial years with all works to be completed by 30 June 2015. At the meeting with TasWater it was indicated that the works were slightly behind schedule with the works currently likely to be completed in November 2015. TasWater indicated that this was due to delays in obtaining planning permits and acquiring land. This implies that there should be an adjustment to expenditure timing as between the 2013/14, 2014/15 and 2015/16 years.

Is the project efficient?

Jacobs Assessment:



Jacobs finds the expenditure within the business case to be efficient; however insufficient evidence has been provided to adequately demonstrate that the new Tasmanian Irrigation solution (which is not in the business case) is efficient. As such, Jacobs is not able to find that the proposed costs for PSP2 are efficient.

Options assessment and selection of the preferred option: The options assessment discussed within the business case include four options:

- a 'do nothing' option,
- the development of a WTP located in the centre of Branxholm,
- the development of a WTP located to the northwest of Branxholm,
- and the development of a water treatment plant located to the south of Ringarooma.

The advantages, disadvantages, capital costs and NPC were considered in determining the preferred option. The Business Case is supported by an Options Report completed by GHD in July 2013. This report discusses these options in more detail and also considers additional options including: compromised water treatment, alternative raw water sources, point of use/entry filter systems and non-infrastructure solutions such as supply by tankered water and installation and use of rainwater tanks. The recommended/preferred option, in both the Business Case and the Options Report, is the construction of a new WTP south of Ringarooma with raw water sourced from the Ringarooma River and extending the treated water supply network to Branxholm and Derby via a transfer pipeline.

The Options Report states:

- Cost estimates have been generated from cost curves, past tenders and GHD experience.
- The estimates are concept level only and are not expected to be better than $\pm 30\%$ accuracy
- The cost estimates included the following:
 - 3% for external engineering and design (D&C contract assumed)
 - 5% for contractors preliminary and detailed design
 - 1.5% for approvals and investigations
 - 2% for construction and project management
 - 30% for budgeting contingency

Jacobs considers that the methodology used for the development of the budget cost estimate to be reasonable at this stage of development and understands that all works were to be tendered and therefore market tested.

Jacobs notes that subsequent to the approval of the Business Case, an updated and varied approach was put to, and approved by, the Board on 6 August 2014 to adopt the option to source raw water from the URIS with Tasmanian Irrigation (TI), without increase to the approved budget. It is understood that further work was undertaken after the initial Board approval with supply from the URIS and TI being preferred to sourcing water from the Ringarooma River. It is understood that TI will supply raw water to TasWater, who will then treat it. At the meeting TasWater indicated that a saving on the pump station and rising main would be achieved through this option, however this will be offset by some additional capital costs associated with this option.

TasWater further states "Whilst this wasn't quantified in the Board update, a review of the project finances would be expected prior to approval of Gate 3, with an update back to the

Board if necessary." Jacobs consider this approach to be reasonable.

Procurement Approach: The procurement plan identifies that the works will be completed through a number of different procurement methods including quotation, contract (open tender as per AS 4300) and direct negotiations. The items identified to be tendered were:

- Environmental heritage studies, topographical survey, geotechnical investigations, external engineering & design, tender documentation
- Detailed design for WTP D&C contract
- Raw water intake structure and pump station (Stage 1)
- Raw water rising main and treated water delivery main to Ringarooma (Stage 1)
- Water treatment plant, reservoir and associated infrastructure (Stage 1)
- Connection of Legerwood and Ringarooma reticulation networks (Stage 2)
- Treated water transfer pipeline between Ringarooma and Branxholm (Stage 3)
- Treated water transfer pipeline between Branxholm and Derby (Stage 4)

Jacobs sought an explanation for the decision to separate the pipeline packages of works. TasWater has advised that the works were to be staggered due to potential skill and timeline constraints. TasWater further advised:

"A majority of the investigations and design work has been sole-selected in accordance with TasWater's Procurement Policy. The construction work is being delivered in 3 packages, namely:

- *Package 1: Pipelines (comprising separable portions for Ringarooma to Branxholm, Branxholm to Derby, and Ringarooma Booster Pump Station). Currently out to tender.*
- *Package 2: WTP. Expected to go to tender in Q2 of FY14/15*
- *Package 3: Reservoirs. Expected to go to tender in Q4 of FY14/15."*

For the investigation and design works, TasWater have stated that they have followed their Procurement Policy. From review of TasWater's Procurement Policy, purchases over \$150,000 must be publically tendered while purchases between \$25,000 and \$150,000 require three written quotes. No details of the contract value have been provided, but this is likely to be in excess of \$25,000. The sole-selection of the investigation and design works, if no quotations or tenders were sought, does not comply with the Procurement Policy. Jacobs considers the procurement approach for the construction works to be appropriate and will result in market tested costs.

Jacobs considers the division of the works to be reasonable.

Recommendations

As discussed above, Jacobs finds that this project is prudent on a needs basis. It is aligned with TasWater's key drivers and obligations, and could be reasonably expected to be undertaken by an operator exercising good industry practice given the circumstances of TasWater at the time the decision was made.

As previously identified, the current cost for the project is based on the original scope of works. TasWater has stated that the change in scope of works is expected to result in similar capital and whole life costs to the original option approved by the Board, but insufficient evidence has been provided to Jacobs to demonstrate this (and to demonstrate why the Tasmanian Irrigation solution is a preferred solution over the within the approved business case).

Jacobs understands that a review of the project costs is expected to be undertaken prior to the approval of Gate 3, including re-approval by the Board if necessary. Jacobs consider this approach to be reasonable given the project's prudence and TasWater's circumstances. Given TasWater expects the revised scope to result in a similar capital expenditure, Jacobs only recommends an adjustment to expenditure timing to reflect the fact that the project is currently running behind schedule. Without further details of the likely schedule delay, Jacobs has proposed to defer half of the costs of the 2014/15 year to the 2015/16 year, as shown in the following table.

	FY14/15	FY15/16	FY16/17	FY17/18	Total
TasWater expenditure	\$0.38M	\$5.57M	\$3.64M	-	\$9.59M
Jacobs Proposed adjustment	-	-\$2.79M	+2.79M	-	-
Jacobs Proposed expenditure	\$0.38M	\$2.79M	\$6.43M	-	\$9.59M

Assumptions

The delay in the project is equivalent to 50% of the costs of the 2014/15 year being deferred to the 2015/16 year.

Reference Documentation


Jacobs has relied on the following documentation in its review:

- Ringarooma Valley Regional Treated Water Scheme - Project Business Case, Version 01, TasWater, undated
- DHHS Priority List – Drinking Water Supply Systems – 2014, DHHS, 18 February 2014
- Ben Lomond Water - Ringarooma Valley Regional Treated Water Solution Options Report, July 2013
- Board Meeting Report - Ringarooma Valley Regional Treated Water Scheme Update, TasWater, 6 August 2014
- Ringarooma Scheme Map - TI Option, GHD, 24 May 2014
- Procurement Policy, Version 1.1, TasWater, November 2013
- Jacobs Draft Report - TasWater response to project assessments, TasWater, 24 November 2014

B.5 Sewer Mains Renewals and CCTV programs

Project Name	Sewer renewal and CCTV program
Primary Driver	Renewal
Organisation	TasWater
Service	Sewerage
Project Type	Proposed (noting sewer renewals and CCTV are also performed at present)
Jacobs Review Number	Project 5

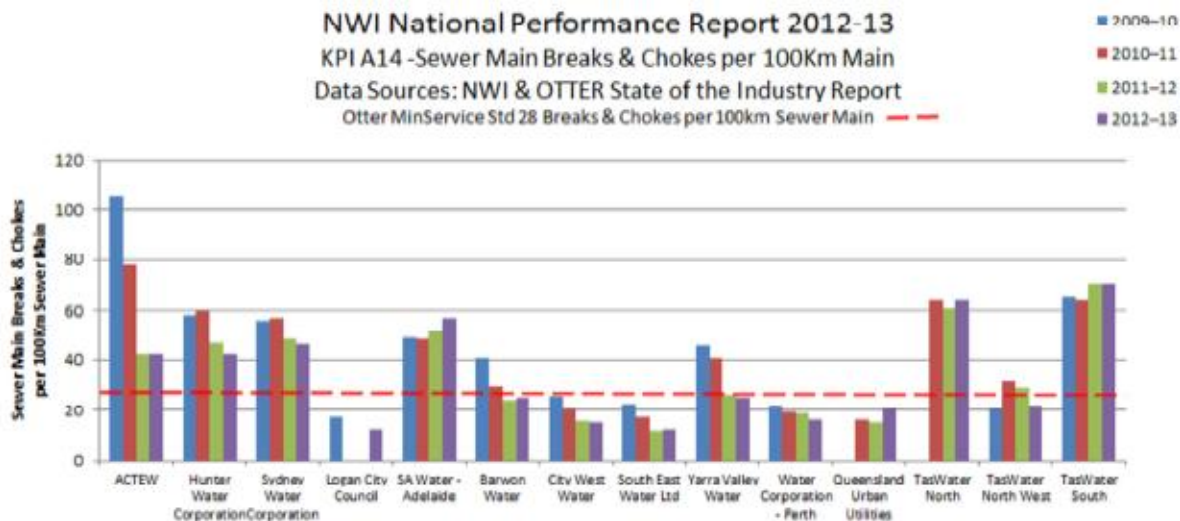
TasWater proposed CAPEX Budget (nominal)								
	FY12/13	FY13/14	FY14/15	FY15/16	FY16/17	FY17/18	Beyond	Total
Sewer renewals – one pager	Not provided	Not provided	\$3M	\$4M	\$4M	\$5.85M	Not provided	\$16.85M
Sewer renewals – B14 160738 – Capital Works	Not provided	Not provided	\$4M	\$4M	\$4M	\$5.85M	\$118.0M	\$135.85M
Sewer CCTV – one pager and – B14 160738 – Capital Works	Not provided	Not provided	\$2M	\$2M	\$1M	\$0.8M	Not provided	\$5.8M

Project Description		
<p>This “project” is effectively an ongoing program of works and comprises two sub-programs: a state-wide sewer CCTV program and a state-wide renewals program which are tied together by the Sewer Pipeline Performance Management Strategy (the Strategy).</p> <p>The CCTV program is a condition inspection program which will collect asset condition information that will assist TasWater to optimise and prioritise its sewer renewal and maintenance program (repairs, planned maintenance and renewal). This in turn will optimise the associated life cycle costs for the assets and achieve targeted improvements in the network’s performance and customer service.</p> <p>The sewer renewal program is an annual program of predominately trenchless sewer and manhole renewal works that will be applied to sewers that are either at the end of their economic life or which represent unacceptable risks to TasWater’s customers or receiving environments. This program will be informed by the CCTV program and the condition assessment information.</p>		
Is the project/program prudent?	Jacobs Assessment:	
<p>In this case, the CCTV and sewer renewal programs have been examined for prudence together, reflecting that they will jointly, amongst other actions, implement the Strategy.</p> <p>A draft of the Strategy was provided to Jacobs and provides context and background to the sewer pipeline issues in TasWater, the key problems to be addressed and a recommended hierarchy of improvements. Key in relation to the question of prudence is the problem statement, which articulates what is trying to be addressed and why. The following two issues in particular are relevant:</p> <ul style="list-style-type: none"> • The performance of TasWater’s sewer network, which is described as seriously deficient when compared to the target service standards (e.g. sewer overflow performance) and also when benchmarked against the performance of its peer Australian water utilities • The lack of robust asset condition information and business processes and procedures which are required to deliver optimal whole of lifecycle costs. <p>Minimum service standards: The current performance of TasWater’s sewer networks clearly fails to meet target service standards across the State (Customer Service Code minimum standards and transitional service standards)³⁷. In 2012-13 it was below the</p>		

³⁷ Customer Service Code only requires TasWater to meet the minimum service standards before the end of PSP2 (30 June 2018). TasWater has proposed a service standard transition path in Table 5 of its Draft PSP2 submission.

Regulator's targets for (a) breaks and chokes per 100km of sewer; (b) the average time to attend sewer spills, breaks and chokes; and (c) sewer spills contained within 5 hours. The results also show significant regional variation across towns and suburbs of Southern Tasmania and seasonally and annually in response to rainfall. TasWater should (and are currently) undertaking a comprehensive review of all this data and using it as a basis for updating the Strategy. In particular TasWater should establish what the long term trends are and whether the 2012/13 data is representative of long term sewer network performance.

Further, TasWater also compares unfavourably when benchmarked against some peer utility businesses. This can be seen in the following figure from the National Performance Report for 2012/13 in relation to main breaks and chokes per 100km.



Condition information and business processes: There is highly variable asset condition data for the 4,774km of sewer network assets, with there being good quality data in one local council, reasonable data in other areas and poor or non-existent data in other areas, particularly in the north and north west. In relation to asset metadata, the Strategy notes that there are still many areas in Tasmania where even the basic asset data is either poor quality or commonly missing (e.g. unknown diameters, material types, depths, invert levels or dates of construction). The limited CCTV data which does exist is held in a number of formats, with significant records on VHS and not yet converted to digital or effectively used in business decision making processes. There is also varying degrees of access to archived CCTV records. Sewer renewal data which has occurred since 2009 in the southern regions is largely held on stand-alone PCs or removable storage. This information was included in the Strategy but has not been independently verified.

Further, the 2012/13 WSAA IWA Aquamark review of asset management capability found the following areas of deficiencies in the three Tasmanian businesses who formed TasWater:

- Largely undetermined end of economic life information to inform the appropriate blend of renewals and maintenance;
- Universally informal processes that lack documentation;
- Poorly defined accountabilities, commonly held too high in the organisational structure for process ownership to develop; and
- An absence of high level strategies.

Conclusion: The CCTV program is prudent as it is required to provide better information on which to make whole of lifecycle decisions around the sewer networks, either to renew the assets or undertake planned maintenance or repair. It is consistent with delivering required service levels in the future and would also be reasonably expected by an operator exercising good industry practice. In terms of timing, it appears appropriate that this program of works occurs now, as long as it is supported by the complementary actions detailed in the Strategy around improving business processes, systems and capabilities.

Similarly, the sewer renewal program is prudent as it required to deliver mandated and appropriate service levels in the future. It is noted that the Strategy does not provide detail or clarity around the timing of this expenditure and how it relates to the CCTV program which will inform the sewer renewal program, particularly if an increase in expenditure is required.

Is the project efficient?	Jacobs Assessment:	
<p>These projects are both at Gate 1 – Project Scope and accordingly the extent of investigation and supporting information is minimal. Despite this, both projects commenced, with expenditure in 2014/15.</p> <p>CCTV program: There has been limited evidence provided in order to substantiate the expenditure for the CCTV program. TasWater has noted that the program has been sized to attract contractors using the latest digital technology (which will offer benefits of speed and diminished storage requirements). In recent discussions with TasWater it has outlined its current State-wide tendering / contracting process for this project. While still being finalised, the initial results are suggesting a monitoring cost per meter which is comparable with industry benchmarks (indicatively \$5/meter). Jacobs notes that in addition to price, the length of the sewer network to be monitored is an important consideration in determining the ultimate cost of the program. TasWater have adopted a risk-based approach, currently using historical performance data from the Southern Region, to identify the sewer lengths to be CCTV'd.</p> <p>Jacobs understands that the current tendering / contracting process does not have delivery performance metrics beyond the length of sewer network inspected. Jacobs considers there is an opportunity for TasWater to use the process to not only deliver efficiency outcomes but also to collect a range of data on other performance outcomes to better establish CCTV and sewer renewal programs needs and the associated expenditure for its business and for future economic regulatory reviews.</p> <p>It is also noted that TasWater is proposing to capitalise the CCTV program costs. In the Regulator's Water and Sewerage Accounting Ring Fencing Guidelines, capital expenditure is defined as follows:</p> <p><i>“Capital expenditure” means expenditure from which future economic benefits are expected to be created and which has been disclosed as a non-current asset in the balance sheet of the regulated entity’s statutory accounts provided that the expenditure conforms to at least one of the following:</i></p> <ul style="list-style-type: none"> • <i>the expenditure relates to the purchase, development or construction of a new non-current asset by the regulated entity;</i> • <i>the expenditure will increase the capacity or functionality of the regulated entity non-current assets;</i> • <i>the expenditure will significantly reduce the ongoing maintenance of the regulated entity non-current assets; and/or</i> • <i>the expenditure will extend the service life of the regulated entity non-current assets beyond that expected when the assets were originally installed.”</i> <p>It seems clear that the expenditure associated with the sewer renewal program will either lead to the development of a new asset or an increased asset life or reduce the ongoing maintenance costs of the existing asset, and therefore is capital expenditure. However in Jacobs' view it is much less clear that all of the CCTV expenditure should be included in a capital program or is appropriate to be or should be capitalised, even noting the Regulator's guidelines.</p> <p>Jacobs notes that from its general business, technical and regulatory experience that CCTV expenditure would more generally be split between opex and capex depending the nature of the activity and the purpose to which the information collected is applied or used. For asset management purposes there are typically three types of asset condition inspections (whether involving CCTV or other means) – Level 1, Level 2 and Level 3. Typically Level 1 inspections are focussed on collecting baseline sewer asset condition information and/or periodic general sewer condition assessment information as part of a routine program to update or confirm asset condition status or as part of overarching investigations. Level 2 inspections (whether involving CCTV or other means) are typically undertaken where a sewer has been identified as potentially having an unacceptable risk (combination of structural and service probability of “failure” and consequence of that failure) and the purpose of the inspection is to confirm the extent of the problem and confirm the risk and the need for action or otherwise. The outcome of the Level 2 inspection might involve renewal, refurbishment or enhanced maintenance or it might involve patch repairs or deferral of expenditure (e.g. by refining the timing of renewal). Level 3 inspections (whether involving CCTV or other means) are typically undertaken once a risk and the decision to act is confirmed (e.g. sewer renewal required) with the purpose of obtaining detailed information to inform the renewal / refurbishment option to be adopted and the detailed design.</p> <p>Jacobs considers that Level 1 sewer asset condition inspection expenditure would be typically opex, Level 3 inspection expenditure would be typically capex and Level 2 expenditure could be either opex or capex although on balance generally capex. On this basis only Level 3 sewer asset inspection expenditure and potentially a high proportion of Level 2 expenditure are appropriate to be capitalised.</p> <p>TasWater has advised that the proposed CCTV program targets the condition assessment of sewers that either have a poor maintenance record (in terms of historical blockages) or are proximate to such assets. Jacobs has been shown ArcMap images which show historical blockages plotted spatially together with the proposed CCTV inspection program. These have been based on the best information available to identify the location and nature of previous failures. TasWater has also noted that other components of the CCTV program include a review of legacy planned maintenance program sewers which have historically resulted in over 80% of sewers being found in a condition suitable for renewal. TasWater considers the CCTV program is not attempting to take a random sample of asset condition, but presents a focussed program of inspection that has the highest likelihood of finding assets that are in a condition suitable for renewal. In TasWater's view the CCTV program should be characterised as predominantly levels 2 and 3 inspections.</p>		

Jacobs is satisfied that, in the main, the CCTV program consists of inspections that are Level 2 and 3 in nature, particularly as they reflect a risk based approach and target locations where failures are known to have occurred or there is existing ongoing maintenance requirements. On this basis, most of the CCTV sewer inspection expenditure could be capitalised.

There may be benefit in clarifying the Regulator's Water and Sewerage Accounting Ring-fencing Guidelines to take account of the above practicalities for future regulatory periods.

Sewer renewal project: TasWater has advised that the funding for these programs of works has been determined via a 'subtractive approach'. In effect, a top-down process where following the allocation of expenditures for all other non-discretionary and priority issues, the sewer renewal program was allocated \$4m per year for the first two years and then \$5.85M in the third year. In the first two years this is slightly higher than the 2012/13 actual spend of \$3.5M. However, this expenditure appears to be substantially below what will be required to address the service standard issues noted above, in particular the break and chokes per 100km. Previous modelling undertaken by Southern Water (before the merger) demonstrates that for its assets, in order to achieve the target of 28 for the break and chokes per 100km service standard, an investment of just under \$30M was required. In addition, the forward program of expenditure beyond the next PSP period is significantly greater and forecast at \$21M per year from 2020/21.

TasWater has also advised that 85% of this expenditure is planned and in a meeting with Jacobs explained that it has allocated this expenditure to renewing assets which have known poor condition (in these cases good asset condition data exists), have previously failed to meet service levels and have a high risk rating. TasWater indicates that these sewer lengths have a confirmed WSAA CIRCA condition grade of 5, or a break/choke rate 5 times above their service standard level of 28 per 100km. The further 15% of the expenditure has been allocated to reactive renewals, reflecting historical spend.

The above approach is acceptable in the short term given the generally accepted poor condition of a large proportion of TasWater's sewer network assets. However in future Jacobs would expect to see a well-developed sewer renewals strategy (for each sewer network or sewer system and for TasWater overall) to more particularly justify this capital expenditure. This strategy would be based on clearly defined objectives (e.g. asset life, acceptable risk profile, sewer overflows), the network/system performance in terms of these defined objectives, the gaps in performance, the need and timing for remedial action, an analysis of the optimal mix of remedial initiatives/options and the expenditure of the preferred approach to address the gaps in performance. A direct nexus between objectives, gaps, remedial action and expenditure needs to be demonstrated robustly and specifically (desirably at a specific asset level). This would be supported by clearly defined and documented asset management decision processes.

Jacobs has seen high level TasWater information which shows the benchmarking of performance of suburbs, towns or catchments relative to the target performance set by the Regulator of 28 breaks and chokes per 100km. TasWater have illustrated the significant gaps between current performance and the targets service standards for many towns/catchments across the state and the magnitude of future investment estimated to address these issues. Jacobs has also viewed for the southern TasWater region how this information has been used to prioritise investment areas via a heat-map approach and the use of ARCMAPS to further detail historical failures. While this more detailed information is not available for other regions across the state, Jacobs is satisfied that TasWater is using the best information available to it in order to formulate a targeted investment program which is prioritises investment.

TasWater has provided Jacobs with information indicating how the build-up of the costs for these renewal projects has been undertaken. Historical costs of sewer relining contracts and project undertaken since 2009 in the Southern TasWater Region for different pipe types and diameters have been used. In the main these should be appropriate, although Jacobs notes that there may be instances where as a result of regional differences (e.g. in geotechnical conditions) there are variations in costs.

It is noted that the operating expenditure savings from this renewals expenditure, in terms of reduced maintenance for the sewers renewed, do not appear to have been taken into account. This was confirmed by TasWater.

Jacobs notes that TasWater is in discussions with the Regulator in relation to the target service level (e.g. for sewer overflows) and its appropriateness given the significant expenditure likely to be required to meet this target and its impact on future prices.

Conclusion:

On balance Jacobs considers that:

- The quantum of expenditure is broadly appropriate for both the sewer renewals and CCTV programs, particularly as it reflects a risk based approach, as well as the best information available to target locations where failures are known to have occurred or there is existing ongoing maintenance requirements, and there is significant gap between current performance and the required service standards;
- The timing of the expenditure may need to be adjusted if the market does not have the capacity to ramp up;
- There may be benefit in clarifying the Regulator's Water and Sewerage Accounting Ring-fencing Guidelines to take account of the practicalities around CCTV inspections and their characterisation as operating or capital expenditure.

Recommendations

Jacobs considers that the State-wide CCTV program and sewer renewal project are prudent as they are consistent with delivering required service levels in the future and would also be reasonably expected by an operator exercising good industry practice.

In relation to the efficiency of these projects on balance the extent of expenditure overall seems appropriate, given the circumstances in which TasWater finds itself in terms of sewer asset management.

Assumptions

None

Reference Documentation


Jacobs has relied on the following documentation in its review:

- Sewer Pipeline Performance Management Strategy
- TasWater Project capital program definition forms
- TasWater response to Jacobs RFI-3 for project 5
- TasWater's response to the draft report
- Conversations with Michael Bendeli – 22 October 2014 and 27 November
- The Regulator's Water and Sewerage Accounting Ring Fencing Guidelines

B.6 Brighton STP rationalisation

Project Name	Brighton STP Rationalisation
Primary Driver	Compliance
Organisation	TasWater
Service	Wastewater
Project Type	Proposed
Jacobs Review Number	Project 6

TasWater proposed CAPEX Budget (nominal)							
FY12/13	FY13/14	FY14/15	FY15/16	FY16/17	FY17/18	Beyond	Total
-	-	\$0.74M	\$0.25M	\$8.13M	-	-	\$9.1M

Project Description		
<p>The Brighton Sewage Treatment Plant (STP) currently treats an average dry weather flow (ADWF) of 0.85 ML/d of sewage from the Brighton catchment, which is above its licensed capacity of 0.65 ML/d. In addition, there is strong growth expected in the catchment area which is anticipated to increase in flow to 1.5 ML/d by approximately 2030.</p> <p>The Brighton STP Rationalisation project involves two stages. The first stage scope, involves the upgrade of the Brighton STP to a capacity of 1.5 ML/d by 2016. The second stage involves further increasing the capacity of the Brighton STP to 5.8 ML/d, to accommodate the diversion of flows from Green Point STP, the decommissioning of Green Point STP and increasing the capacity of the recycled water system by 2024. It is noted that Stage 2 will not be required for approximately eight years and is not part of this review.</p>		
Is the project prudent?	Jacobs Assessment:	
<p>Jacobs considers that the works on the Brighton WWTP are prudent. Based on the evidence sighted, it is consistent with delivering TasWater's (previously BLW's) required obligations and could be reasonably expected to be undertaken by an operator exercising good industry practice.</p> <p>Project need: The project drivers are 'Compliance' and 'Growth'. The Brighton STP was ranked 12 (out of 117) in 'Doc 53 - State-wide WWMP Level 2 2013 risk assessment' and 27 (out of 33) on the 'Wastewater Treatment Plant (WWTP) Compliance – Priority List' issued by the EPA on 21 December 2009. Evidence that the plant is regularly exceeding its licenced design capacity has been sighted. TasWater recognises that the Brighton WWTP is consistently exceeding its average daily dry weather flow limit of 650 kL/day as per the plant's current EPA operating permit (EPN). There is a clear regulatory need for TasWater to take action to resolve these non-compliances and the project is considered to be mandatory. Jacobs agrees that the 'do nothing' solution is not acceptable.</p> <p>TasWater has also provided Brighton Council planning projections in support of the growth element of the project which indicates the extent of non-compliance will increase.</p> <p>Cost driver allocation: Jacobs agrees that there are multiple cost drivers for this project aligned with the Ring Fencing Guideline – including compliance, growth, renewals and improvement. It is Jacobs' opinion that the primary driver is compliance.</p> <p>Project timing: The inclusion of the project within the PSP expenditure program is consistent with TasWater's risk-based capital prioritisation process, noting TasWater's decision to continue with the delivery of compliance commitments made by its legacy regional organisations; and that it is TasWater's DP&EMPs that detail the proposed timing of non-compliance rectifications (rather than the EPA issuing event based EPNs with compliance deadlines). The project Business Case was developed in August 2014. . TasWater have advised that subsequent to this, the technology assessment has been revisited and the Business Case amended to reflect the outcomes. The revised Business Case will be presented at the December 2014 Board Meeting. Jacobs has not sighted the revised Business Case.</p> <p>Planning horizon: The plant has been designed to accommodate flows to the 2030 horizon, 1.5 ML/d. The Brighton Council planning projections, undertaken in 2009, were provided by TasWater to support the growth and demand estimates in the Business Case. TasWater stated that "growth forecasting has not been formally updated since the 2009 estimates, however it is proposed that this will be revisited after the Business Case is completed and the preferred treatment technology is endorsed. While opportunities for cost savings</p>		

in will be sought in the design optimization, the opportunities for cost savings in Stage 1 from reduced sizing are considered to be relatively minor given current flows and the ongoing high growth rate in Brighton since 2009. Jacobs considers that the 2009 forecasts are a reasonable basis for proceeding, however it is prudent for TasWater to review and update the growth and demand estimates to confirm the sizing of the infrastructure, as proposed.

Deliverability: The Business Case indicates that the works will be undertaken over the 2014/15 to 2016/17 financial years with the majority of the expenditure anticipated in the 2016/17 financial year. Jacobs considers the time allowed for various aspects of the project to be reasonable and appropriate.

Is the project efficient?	Jacobs Assessment:	
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Given that TasWater is currently reviewing the project and developing a new business case, it is possible that the final solution and therefore the final expenditure may be different to that which is included in PSP2. However, given that the PSP2 can only capture costs at a certain point in time, based on the evidence provided, Jacobs finds that the expenditure currently proposed to be efficient.

An optioneering report, undertaken in 2011, investigated two location and configuration options (a new WWTP at Brighton and upgraded WWTP at Bridgewater (Green Point) and a new WWTP at Brighton (incorporating capacity for flows from Bridgewater), and pump station and rising main from Bridgewater to Brighton WWTP) as well as a number of treatment plant options (activated sludge, oxidation ditch / extended aeration, aerated lagoon, MBBR / IFAS, batch activated sludge: IDEA, facultative lagoons, and UASB anaerobic process). It is noted that no non-network options were considered. TasWater stated that *“the Brighton STP Upgrade is contingent on providing full reuse of final effluent as recycled water”*.

From the options assessment, an aerated lagoon plant was identified as the preferred option for the Brighton WWTP, while an extended aeration plant was the preferred option for the Green Point WWTP. Subsequently, rationalisation of the Brighton WWTP to the Honeywood site and upgrading of its licence capacity from 0.65 ML/d to 1.9 ML/d to cater for at least 30 years of growth in the area was proposed to the Board in 2013. A business case was developed in August 2014 which aligned with this solution.

In response to a RFI, TasWater stated that the Business Case has not yet been approved by the Board. Its submittal to the Board has been deferred to December 2014 to allow a review and reconfirmation of process technology. TasWater stated that: *“The Business Case will be updated to include (i) the outcomes of the review and (ii) a greater focus on the Stage 1 scope of work options, with a corresponding reduction on the level of detail provided on the overall (Stage 1 + 2) strategy. The funding request will still be for the Stage 1 capital expenditure only, as per the current version of the Business Case”*. Subsequent to this, Jacobs understands that the technology assessment has been revisited, and the capital and operating costs for shortlisted options independently updated for inclusion in the Business Case and NPV model. TasWater has stated that: *“The Business Case has been amended to reflect these updates and is about to be circulated to TasWater management for review/comment in preparation for presentation at the December 2014 Board Meeting”*.

Cost estimates were originally prepared during the optioneering investigation. A scoping review and cost estimate update was subsequently undertaken. The revised cost estimate was developed based on the preliminary design and cost estimate, the Development Proposal and Environment Management Plan (DPEMP) prepared by TasWater, technical and costing knowledge and previous wastewater project experience, supplier equipment information, unit rates from Rawlinson’s (2014) and previous project data. The revised cost estimate was over 30% higher than the original cost estimate. This variance is mainly associated with the inlet works and electrical works where additional scope has been added, such as odour treatment, platforms and handrails, SCADA and cabling. A 30% contingency allowance was included in the revised cost estimate, along with 3.5% for project management and 4% for construction management. For the current stage of project development the allowances seem reasonable. Jacobs considered the cost estimation methodology to be appropriate for this stage of the project. The revised cost estimate is reasonable as it was undertaken by an independent consultant and based on reliable sources.

Jacobs understands that subsequent to this the capital and operating costs for shortlisted options have been independently updated. We have not sighted the new cost estimates. However, we acknowledge that the PSP reflects the costs of a project at a point in time. As such, Jacobs accepts the costs as reasonable. Jacobs would expect the works to be competitively tendered and therefore market tested as the project progresses.

Procurement Approach: The business case states that *“it is assumed that the upgrade will be delivered via a detailed design for civil and structural works followed by a separate construction contract for implementation of the works. Separate supply and install contracts will be adopted for process, mechanical, electrical and process control works”*. In the RFI response, TasWater stated it is currently assessing its preferred delivery strategy and therefore the delivery method may not be as documented in the current business case. Jacobs considers that this is reasonable however decision regarding the procurement approach and delivery method may have some impact on project timing.

Recommendations

In summary, Jacobs considers that this project is prudent as there is a need to complete works on the Brighton WWTP. While insufficient supporting documentation has been provided regarding the growth projections, it is noted that TasWater are intending to review them subsequent to approval of the Business Case.

Jacobs considers the methodology used to develop the cost estimates to be appropriate for the current stage of the project. Jacobs notes that the PSP can only capture costs at a certain point in time. As such, the expenditure currently proposed in the PSP2 is considered to be efficient. However given that a final solution has not been selected, there is the possibility that the scope and therefore costs will change in the future.

Assumptions

None

Reference Documentation

Jacobs has relied on the following documentation in our review:

- Brighton STP Strategy Business Case, Version 0.3, TasWater, 17 September 2014
- Environment Protection Notice 7059/1 - Brighton WWTP, Department of Primary Industries, Water and Environment, June 2005
- Annual Environmental Review - Brighton WWTP 1 July 2012 to 30 June 2013, Department of Primary Industries, Water and Environment, July 2013
- Brighton Municipality Water and Sewerage - Lot Release Prediction, Southern Water, undated
- E-mail from Council re Growth prediction in Brighton Municipality, Rob Higgins (Brighton Council), 4 October 2010
- Brighton and Green Pt WWTP - estimated flow and population growth spreadsheet, from Aurecon Structure Plan, 2009
- MCA - Treatment process, undated
- Brighton WWTP Preliminary Design - Optioneering Report, SKM, 25 February 2011
- Board Paper - Brighton Wastewater Strategy Update, Southern Water, 24 April 20103
- Board Paper - Brighton STP Land Purchase, Southern Water, 24 April 2013
- Brighton WWTP - Upset Conditions (Desludging) Assessment, GHD, October 2013
- Brighton STP Upgrade - Scoping Review and Cost Estimate Update, Inside Infrastructure, 25 September 2014
- Brighton STP Upgrade - Brighton PSP Audit Response (Ver 1), TasWater, undated
- Brighton Wastewater Treatment Plant Preliminary Design - Optioneering Report, SKM, 24 March 2011
- Jacobs Draft Report - TasWater response to project assessments, TasWater, 24 November 2014

B.7 Kingborough sewerage strategy

Project Name	Kingborough Sewerage System Strategy
Primary Driver	Growth
Organisation	TasWater
Service	Wastewater
Project Type	Proposed
Jacobs Review Number	Project 7

TasWater proposed CAPEX Budget (nominal)								
	FY12/13	FY13/14	FY14/15	FY15/16	FY16/17	FY17/18	Beyond	Total
TW Originally Proposed				\$22.M	\$21.9M		\$37.6M	\$81.6M
TW Revised Proposal (in PSP)		\$0.385M	\$1.15M	\$2.2M	\$28.0M	\$12.35M		\$44M

Project Description
<p>The project involves consolidating and enhancing the regional sewerage system which currently comprises of three main plants in Electrona, Margate and the largest at Blackmans Bay (a smaller plant at Howden will also be encompassed in the project). It is consistent with the Kingborough Sewerage System Strategy and the broader planning approach of seeking to rationalise treatment plants where feasible.</p> <p>Currently each of these plants treats sewage from its local catchment and then discharges the treated effluent at outfalls in North West Bay, D'Entrecasteaux Channel and the lower Derwent Estuary. The business case notes that Electrona and Margate sewerage treatment plants (STPs) are currently exceeding their licence capacity and are failing to achieve compliance with required regulatory effluent standards.</p> <p>The proposed project involves upgrading the Blackmans Bay STP to centralise treatment from the current Blackmans Bay, Electrona, Margate and Howden STP catchments. This will allow Electrona, Margate and Howden STPs to be decommissioned and for effluent discharge into North West Bay to be ceased. While discharge from Blackmans Bay STP will increase, it has been found the Derwent Estuary provides for greater mixing and distribution within the receiving waters.</p> <p>The scope of works includes:</p> <ul style="list-style-type: none"> • Blackman Bay STP upgrade to increase its capacity from 4.1ML/day to 8.5MD/day. A membrane bioreactor (MBR) technology will be implemented to achieve full biological nitrogen reduction and reduce the risk of any toxicity events in algal blooms in the receiving waters. The upgrade will provide capacity to 2040. • Construction of new sewer pump stations (SPSs) at the Electrona STP site, Dru Point (Margate) STP site and the Howden STP site • Installation of new pipelines from the Electrona, Margate and Howden SPSs to Blackman Bay. A marine pipe will cross North West Bay and a terrestrial pipe will then run along Alanwood Road (to the south of Peter Murrell Reserve) and then Brightwater Road. The final 800m of pipeline prior to discharge to the existing Blackmans Bay rising main will be installed in a residential area and will require careful planning and stakeholder engagement. Only a very small section of the pipeline will pass through the Peter Murrell Reserve on the south-eastern boundary where aboriginal heritage and environmental risks are considered to be relatively low relative to other alignment options that were considered. • Decommissioning of the existing Electrona and Margate STPs – following completion the upgrade project, the Margate, Electrona and Howden STPs will be decommissioned.

Is the project prudent?	Jacobs Assessment:	
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Jacobs finds that this project is prudent on a needs basis. It is aligned with TasWater’s key drivers and licence requirements, and could be reasonably expected to be undertaken by an operator exercising good industry practice given the circumstances of TasWater at the time the decision was made.

Project Need: As a result of growth in each of the local catchments served by the three STPs, the EPA licence requirements and effluent standards are not being met. This has been the case for several years, with a 2011 Board Meeting Report (Southern Water) on the Kingborough Wastewater Strategy detailing the average dry weather flows exceeding licence requirements and effluent quality also not meeting the licence requirements. This can be seen in the table below.

[Redacted header text]

[Redacted]	[Redacted]	[Redacted]	[Redacted]
[Redacted]	[Redacted]	[Redacted]	[Redacted]
[Redacted]	[Redacted]	[Redacted]	[Redacted]
[Redacted]	[Redacted]	[Redacted]	[Redacted]
[Redacted]	[Redacted]	[Redacted]	[Redacted]
[Redacted]	[Redacted]	[Redacted]	[Redacted]
[Redacted]	[Redacted]	[Redacted]	[Redacted]

This presents a clear regulatory need for TasWater to take action to address the growth in the area and resolve these non-compliances. Jacobs agrees that the ‘do nothing’ solution is not acceptable.

Cost driver allocation: TasWater has classified this project’s primary driver as growth and the secondary driver as compliance. Jacobs agrees with this approach as the compliance issues appear to have been triggered by the growth in each of the local catchments served by the STP, with higher flows than allowed under the licence requirements.

Project Timing: The inclusion of the project within the PSP2 expenditure program is consistent with TasWater’s risk-based capital prioritisation process, noting TasWater’s decision to continue with the delivery of compliance commitments made by its legacy regional organisations; and that it is TasWater’s DP&EMPs that detail the proposed timing of non-compliance rectifications (rather than the EPA issuing event based EPNs with compliance deadlines). TasWater’s state-wide October 2014 WWMP risk assessment ranks Margate 4 out of 110 systems, Electrona 5 out of 110 systems and Blackmans Bay 17 out of 110 systems (where all top 32 systems have high priority licence compliance issues and all of the top 10 priority systems have capital projects for PSP1 and/or PSP2). The project business case was initially developed by Southern Water and approved by the Board in May 2011. Recognising this need, the business case has since been updated by TasWater and approved by the Board in July 2014.

Is the project efficient?	Jacobs Assessment:	
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It is Jacobs’ opinion that the selection of the preferred option is consistent with an operator exercising good industry practice, and while not the least cost option, there is a well-structured approach to the multi-criteria analysis which resulted in this decision. Evidence has been sighted that appropriate detailed planning and cost development has occurred. TasWater has informed Jacobs that growth information is available to adequately justify the sizing of the STP treatment facilities but this evidence has not been provided and in this regard Jacobs is not satisfied that the STP has been justified as being efficient. Jacobs considers the recently revised timing for delivery of the project, with completion in 2017/18 to be more realistic than that originally contemplated (of completion by 2016/17).

Options Assessment and selection of the preferred option: The options assessment discussed within the business case considered two treatment options at the Blackmans Bay STP (Sequencing Batch Reactor (SBR) or membrane bioreactor (MBR)) as well as three alignment options for the sewer pipeline from Dru Point (Margate) STP site to the Blackmans Bay STP and the 'do nothing' option. These options were developed following consideration by the Southern Water Board in 2011 of three broader options:

- Option 1: The Margate and Electrona STPs are closed and flows diverted to an upgraded Blackmans Bay STP that could process these and additional flows from growth in its local catchment (this was the preferred option further considered in the business case).
- Option 2: Blackmans Bay STP is upgraded to treat expected growth in its local catchment, Margate STP is decommissioned and flows diverted to an upgraded Electrona STP.
- Option 3: Blackmans Bay STP is upgraded to treat expected growth in its local catchment and the Margate and Electrona STPs are decommissioned with flows diverted to a new WWTP on Snug Point.

Based on the high-level numbers provided in the current business case, Jacobs notes that the preferred option (Option 4) of using a MBR treatment process at the Blackmans Bay STP and an alignment of the pipeline from Dru Point along Allanwood and Brightwater Roads has the second highest NPC. It is around \$5M higher than the lowest NPC (excluding the 'do nothing option'). The business case notes that the MBR option has been conservatively calculated leading to a higher NPC and that if operated optimally the life expectancy of the membranes will be extended, reducing the lifecycle cost of the option. This has been sensitivity tested in the NPV/NPC analysis and extending the membrane life beyond the 7 years assumed, to at least 10 to 12 years reduces the NPC such that the differential between the lowest NPC and these options is around \$3-3.5M.

Adoption of Option 4 at a slightly higher cost has been justified on risk and non-cost grounds and is considered reasonable. In the business case it is noted that the preferred option has been assessed to represent the optimal balance of cost and risk. Specifically, it is the option least likely to be subject to onerous approvals and conditions, negates the need to design and construct the pipeline in busy road conditions and environmentally sensitive reserves. Further, in terms of the STP treatment process, MBR will more likely fully and reliably comply with expected licence requirements and will have a smaller footprint (50% less) in a very constrained site which will also reduce the risk of potential project cost over-runs. The MBR option also has the ability to assist in containing peak wet weather flows on site and provides a low risk option for managing odour, which is an important consideration given the proximity to near neighbours. Conversely, the option with the lowest NPC was not recommended because of complications expected in putting the new pipeline through an environmentally and community sensitive reserve and the SBR treatment process (among other limitations) requires a larger footprint.

In developing this recommendation, TasWater undertook a multi-criteria assessment (MCA) and cost-benefit analysis. Jacobs has seen some of the MCA documentation prepared by Tenix in relation to this process, in which it appears that the MBR treatment process was ranked highest in terms of operability, constructability, risk, quality, capacity and the environment. Jacobs is satisfied that this analysis was undertaken in a systematic way enabling an appropriate and balanced evaluation of the cost and non-cost factors.

The NPV/NPC analysis has taken into account all relevant costs. TasWater has advised that decommissioning cost have been included for each of the Electrona, Margate and Howden STPs in the most recent business case but no allowance for the sale of land as there is no evidence (to date) of possible sales. The recycled water supplied from the Howden STP is not currently charged for and therefore "lost" revenues do not need to be incorporated into the analysis. Operating expenditure savings have been estimated as part of the NPV analysis process (although it is understood that generally project-specific operating expenditure savings have not been incorporated into the draft PSP2 submission).

Sizing of the options: Jacobs has examined the population growth forecasting used as the basis for sizing the STP treatment facilities (i.e. to determine the ML/day required). Some information was provided to Jacobs around the different growth forecasts for the catchment and their impact on future capacity of the Blackmans Bay STP. Jacobs notes this information was not set out in a clear and logical way that transparently detailed the assumptions being made, the basis for those assumptions, the scenarios considered and the resulting growth and size requirements. In its initial response TasWater did note that the information provided was not exhaustive but rather given to indicate the work undertaken and how different variables and growth forecasts have been used. In response to Jacobs' request for further information, TasWater noted that the sizing is based on consideration of projected population growth in consultation with Council and validated based on known development proposals and land use/rezoning. Further that a recent review of incoming flows completed as a part of preliminary design suggests that the observed flow of around 5ML/day compares well with the growth forecasting. TasWater has not provided the further information, noting the large volume of data and correspondence, but that it can be made available if required.

TasWater has informed Jacobs that the information is available to adequately justify the sizing of the STP treatment facilities but this evidence has not been provided. Jacobs considers that insufficient information has been provided for it to find the project has been appropriately sized. Jacobs notes that in the future, to support internal business case approval processes, as well as regulatory reviews, it would be of benefit if TasWater had a master document or spreadsheet in which it summarises the conclusions of its extensive analysis, including the different scenarios and assumptions considered, and references the information used to support this analysis.

Cost estimates: TasWater has provided a detailed cost spreadsheet with the capital costs listed for over 438 line items, including details around construction components, phases, categories, items, costs and comments / assumptions. TasWater has advised that this was prepared using previous consultant reports and their in-house experience, including from recently tendered / constructed works such as the Andrews Street SPS. TasWater also noted that Tenix provided direct constructor input based on its relevant MBR and other treatment plant costing experience; that the pipeline has undergone ECI to verify constructability and associated cost estimate; and P&S and GHD have used experience and some market costings to establish their cost respective estimates. Risk costs have been captured in the 30% contingency applied as standard for Gate 2 business cases.

The spreadsheet also details operating expenditure. The final tab of the spreadsheet notes several issues that appear to be under consideration and which could impact on the ultimate project cost. Jacobs requested further information from TasWater in relation to these issues so that it could have confidence in the cost estimates provided. TasWater noted that the list of issues was a 'check list' of items to be verified in completing the business case and that each item has been addressed. It also provided further detail which adequately explained how each issue had been addressed.

Procurement Approach: The business case does not detail the proposed procurement approach and TasWater has separately indicated that the contract delivery strategy is yet to be finalised and may be influenced by delivery options and service providers for other capital projects. This is consistent with the high level work plan included in the business case and the project schedule provided by TasWater which notes that detailed design and construction will not begin until May 2015.

TasWater also provided further detail around the short timeframes between the detailed design being completed (July 2015) and the tendering and contract awarded (November 2015). While accepting that the pipeline may not be bound by the same EPA approvals as the Blackmans Bay STP, allowing some contracts to be awarded sooner, Jacobs considers the timeframes to be ambitious. It also notes that the current capital works program is forecasting the majority of expenditure in 2016/17 and the remaining spend in 2017/18. Jacobs considers for a project of this size, which is a large capital investment for TasWater the size of which has not been undertaken for some time, this revised timing is more realistic than completion in 2016/17. It is Jacobs' opinion that some further re-distribution of expenditure from 2016/17 to 2017/18 would be more appropriate and consistent with delivery practicalities, but information and time constraints within this review have limited Jacobs' ability to make a robust adjustment recommendation.

Recommendation

Jacobs considers this project is prudent reflecting the growth needs in the catchment (with capacity already exceeded) and the associated compliance issues.

It also is of the view that the selection of the preferred option is consistent with an operator exercising good industry practice, and while not the least cost option, it is supported by appropriate multi-criteria analysis. Detailed cost estimates for the project have been provided and it appears that a degree of rigour has been applied to establish robust estimates for a business case at Gate 2. However, Jacobs has concerns in relation to the sizing of the Blackmans Bay STP. While TasWater has informed Jacobs that the information is available to adequately justify its growth forecasts that are the basis of the sizing this evidence has not been provided and as a result Jacobs is unable to conclude that the project is efficient.

Jacobs also considers the revised timing of the project as detailed in the most recent version of the capital works program spreadsheet, with completion in 2017/18 to be more realistic.

Assumptions

Where extracts of information have been provided, that these are from more complete reports that are available e.g. the multi-criteria analysis and the growth forecasting.

Reference Documentation


Jacobs has relied on the following documentation in our review:

- Kingborough Wastewater Strategy Board Meeting Report – 8 November 2011
- NPV analysis spreadsheet
- Extract of multi-criteria analysis (Tenix)
- Detailed cost spreadsheet
- Examples of growth planning considerations
- Extract of the project schedule
- Revised capital works program
- TasWater response to the Jacobs RFI
- TasWater's response to the draft report

B.8 Ti Tree Bend WWTP centrifuge and digester upgrade

Project Name	Ti Tree Bend WWTP - Centrifuge (Biosolids Reduction) & Digester Upgrade
Primary Driver	Compliance
Organisation	TasWater
Service	Wastewater
Project Type	Proposed
Jacobs Review Number	Project 8

Source	TasWater proposed CAPEX Budget (nominal)							Total
	FY12/13	FY13/14	FY14/15	FY15/16	FY16/17	FY17/18	Beyond	
PSP2	No breakdown provided							\$9.0M
Digester Upgrade	-	\$0.5M	\$0.3M	\$3.1M	-	-	-	\$3.9M
Biosolids Handling Facility	-	\$0.4M	\$0.3M	\$3.0M	\$5.5M	-	-	\$9.2M

Project Description		
<p>The Ti Tree Bend Sewage Treatment Plant (STP) is an activated sludge sewage treatment plant that caters for combined sewage and drainage inflows. Sludge from the treatment process is treated / digested by two anaerobic digesters. The existing sludge digestion system is performing poorly with partially treated (odorous) sludge discharged to the sludge drying lagoons. This odour source (modelled to be 40% of the site odour generation) is a significant component of the site's odour issue adversely impacting plant neighbours. The Ti Tree Bend STP site has had numerous odour complaints and has had a specific EPN issued to address odour.</p> <p>The overall project involves two separate projects to improve the sludge handling process at the Ti Tree Bend STP and consequently reduce odour at the site. These projects are the upgrading of the existing digesters and installation of a biosolids dewatering facility, consisting of a rotary screw thickener and sludge drying halls (solar dryers). . This review focuses on the Digester Upgrade as only information on this project was available at the start of this review. A Business Case for the Biosolids Dewatering Facility has been developed, but due to the timing of this document, a detailed assessment of this was not possible in this review.</p>		
Is the project prudent?	Jacobs Assessment:	
<p>Jacobs finds that this project is prudent on a needs basis. It is aligned with TasWater's key drivers and obligations, and could be reasonably expected to be undertaken by an operator exercising good industry practice given the circumstances of TasWater at the time the decision was made.</p> <p>Project need: The project driver identified in the PSP2 is compliance. The <i>Digester Upgrade Business Case</i> also lists growth as a driver. The Ti Tree Bend STP was ranked ninth (out of 112) in 'Doc 53 - State-wide WWMP Level 2 2013 risk assessment' and sixth (out of 28) on the 'Wastewater Treatment Plant (WWTP) Compliance – Priority List' issued by the EPA on 21 December 2009. BLW was issued with an Environmental Protection Notice (EPN) on the 22 September 2011 regarding odour emissions from the Ti Tree Bend STP. Jacobs notes that the EPN sets out specific dates by which actions were required to be undertaken, as outlined below:</p> <ul style="list-style-type: none"> • Interim improvement work - 1 December 2011 • Odour modelling and monitoring program - 1 December 2011 • Odour Abatement Plan - 1 August 2012 <p>Jacobs has not sighted evidence that the three above timeframes were met or the Odour Abatement Plan was prepared or that the works to be undertaken for this project and the timing of those works were sufficiently documented and justified in the Odour Abatement Plan.</p> <p>The <i>Digester Upgrade Business Case</i> states that the sludge digesters are currently over-loaded and that the poor performance of the digesters results in odour emission that breach environmental standards. In response to a RFI, TasWater states "Current growth and</p>		

trade waste input projections indicate continued increase of flows to the plant and as such increased sludge loads will be generated. Any future process improvements will also be likely to increase sludge generation."

No evidence of odour emissions exceeding licence condition, resulting in non-compliances, has been sighted. However, Jacobs agrees that the 'do nothing' solution is not acceptable.

Cost driver allocation: Jacobs agrees that there are multiple cost drivers for this project aligned with the Ring Fencing Guideline – including compliance, growth and improvement. From Jacobs' considerable experience in this area it seems likely that a strong case could be made out for works to be undertaken by an authority acting reasonably given the circumstance. It is Jacobs' opinion that the primary driver is compliance.

Project timing: The inclusion of the project within the PSP2 expenditure program is consistent with TasWater's risk-based capital prioritisation process. The business cases were developed in August 2014. No evidence of approval by the Board has been sighted.

Planning horizon: The *Digester Upgrade Business Case* adopts a 20 year planning horizon for the sizing of infrastructure. This was based on historic sludge load monitoring data, gathered in 2013, along with estimates of future sludge quantities based on future load scenarios for the LSIP, which included population increases and separated sewer catchment rationalisation.

Deliverability: The *Digester Upgrade Business Case* indicates that the works will be undertaken over the 2014/15 to 2016/17 financial years, with commissioning of the digester in September 2016. Jacobs considers the time allowed for various aspects of the project to be reasonable and appropriate.

Is the project efficient?

Jacobs Assessment:



Based on the evidence provided, Jacobs finds that the expenditure proposed in the PSP2 for the Digester Upgrade to be efficient. The expenditure represents the best and most cost effective way of meeting the community's need for the relevant service. Due to the timing of the development of the Business Case for the Biosolids Dewatering Facility, Jacobs has been unable to undertake a detailed review of the efficiency of this element of the project. As such we are unable to conclude that this element is efficient.

Options Assessment and selection of the preferred option: A number of options were considered for the upgrade of the digester, as outlined below:

- Option 1 - Do Nothing/Business as Usual;
- Option 2 - Providing heating and mixing to the second digester and operating the two digesters in parallel;
- Option 3 - Thicken the digested sludge by the provision of recuperative thickening and provide heating and mixing to the second digester and operate the two digesters in parallel;
- Option 4 - Thicken the primary sludge and provide heating and mixing to the second digester and operate the two digesters in parallel; and
- Option 5 - Construct a third digester and operate the digesters as two primary digesters in parallel, with a third digester operating as a secondary digester.

Option 3, installation of recuperative sludge thickening, was identified as the preferred option as it had the lowest CAPEX and provides the best NPV of the viable options assessed.

Jacobs notes that no non-treatment options such as separation of combined sewers were included in the options analysis. TasWater's response to the RFI states that *"The cost associated with separating the combined system is estimated to be of the order of \$200m at this point TasWater is not in a position to consider separation."* Jacobs considers that all reasonable and practical options were considered.

The budget estimate for this project is \$3.903 million including an allowance of \$0.780 million to empty/clean-out Digester 2. Engineering consultants were engaged during the investigation and design process and completed a cost estimate. The cost estimate was developed using standard unit rates (pipework, pumps, electrical, etc.) where available or based on like jobs. A 30% contingency allowance has been included in the cost estimation. No detailed breakdown of the cost estimate has been sighted. Jacobs considered the cost estimation methodology to be appropriate for this stage of the project. Jacobs would expect the works to be competitively tendered and therefore market tested as the project progresses.

Procurement Approach: No evidence of the procurement approach to be adopted has been sighted. As a result, it is unclear to Jacobs' if the approach being adopted by TasWater is reasonable and efficient. The Work Plan within the Business Case indicates that two separate tenders will be awarded: one for the Recuperative Thickening and the other for the Digester 2 Upgrade/Parallel Operation. In response to an RFI, TasWater stated: *"These decisions will be made by works delivery during the gate 3 process (post business case approval)."*

Recommendations

In summary, Jacobs considers that the project is prudent. Based on the evidence sighted, it is consistent with delivering TasWater's (and predecessor BLW's) required obligations and level of service requirements could be reasonably expected to be undertaken by an operator exercising good industry practice.

Jacobs considers the methodology used to develop the cost estimates for the digester to be appropriate for the current stage of the project but would expect it to be market tested as the project progress to ensure that the minimum level of expenditure required to deliver the desired outcome is obtained. Jacobs considers that the \$3.9 million documented in the Digester Upgrade business case to be justified and therefore efficient. As noted above, due to the timing of the development of the Business Case for the Biosolids Dewatering Facility, Jacobs has been unable to undertake a detailed review of the efficiency of this element of the project. As such we are unable to conclude that this element is efficient..

Assumptions

None

Reference Documentation

Jacobs has relied on the following documentation in its review:

- Ti Tree Bend STP Digester Upgrade Business Case, Version 0.2, TasWater, 17 September 2014
- Jacobs RFI-15 CAPEX - Project 8 Ti Tree Bend STP, TasWater
- Letter from EPA - Re EPN 8638/1 - Ti Tree Bend Wastewater Treatment Plant, Environmental Protection Authority Tasmania, 22 September 2011
- Ti Tree Bend STP - Digester Upgrade - Business Case NPV 2014 09 09, Spreadsheet, TasWater
- Biosolids Handling Facility Business Case, Version 0.2, TasWater, 3 September 2014
- Jacobs Draft Report - TasWater response to project assessments, TasWater, 24 November 2014

B.9 Small Towns Water Supply Strategy

Project Name	Small Towns Supply Strategy
Primary Driver	Compliance
Organisation	TasWater
Service	Water
Project Type	Proposed
Jacobs Review Number	Project 9

TasWater proposed CAPEX Budget (nominal)							
FY12/13	FY13/14	FY14/15	FY15/16	FY16/17	FY17/18	Beyond	Total
No detail provided	No detail provided	No detail provided	No detail provided	No detail provided	No detail provided	No detail provided	No detail provided

Project Description		
<p>The Small Towns Supply Strategy has been developed by TasWater to provide a transparent and consistent framework for the assessment of options for the provision of water services to communities within small towns. The Framework has been developed to provide TasWater with guidance for decision making which takes into consideration:</p> <ul style="list-style-type: none"> • Australian Drinking Water Guidelines (ADWGs) • Tasmanian Drinking Water Quality Guidelines (TDWQG) – which provides two mechanisms for addressing immediate public health risks, including Boil Water Alerts (temporary or permanent) and a Public Health Alert (i.e. a “Do Not Consume”) notice • Department of Health and Human Services (DHHS) requirements. The Strategy indicates that DHHS is not willing to accept a permanent Boil Water Alert Notice or Public Health Alert as a viable solution to address non-compliant drinking water quality standards. <p>The strategy outlines a high level process against a broad set of criteria for determining whether to provide treated water in accordance with TDWQG or whether to implement Service Replacement (i.e. with an appropriate alternative supply source). These categories are as follows:</p>		
Category	Water treatment or service replacement	Criteria
Category A (1)	Water treatment	Cost per connection < \$20,000
Category A (2)	Water treatment	<ul style="list-style-type: none"> • Cost per connection > \$20,000, but • The town meets at least one of the following key assessment criteria: <ol style="list-style-type: none"> 1. There are at least approximately 100 connections, with more than 60% of the premises occupied 2. There is a growing population base 3. The water supplies social services, industries or schools 4. The water supply is on a major tourist route.
Category B	Service replacement with alternative cost effective supplies such as water tanks, irrigation supplies or other non-potable arrangements.	<ul style="list-style-type: none"> • Cost per connection > \$20,000, • The town does not meet any of the other key assessment criteria (listed under A2) <p>Alternative options are implemented only after alternative options are discussed with communities, owners, regulators and DHHS.</p>
<p>This above strategy draws on, and expands on the framework developed by Ben Lomond Water in July 2012. In particular, the \$20,000 per connection threshold is based on the Ben Lomond strategy and does not appear to have been further tested by TasWater.</p>		

In its response to the draft report, TasWater noted that the guidelines provide a first cut assessment for all systems that pose a public health risk. Where systems do not fall into Category A1 or A2, a detailed system analysis will be undertaken to determine appropriate upgrade options or alternatives. TasWater also noted that this body of work is currently being completed as part of the Small Towns Water Supply Strategy. Jacobs has not been provided with a draft strategy and therefore has based its assessment on the limited information that has been made available.

Is the strategy prudent?

Jacobs Assessment:



Jacobs finds that on balance the Small Towns Supply Strategy overall is prudent simply because there is a generally unarguable need to address the water quality issues in small towns. However, the needs basis, the prioritisation of towns and the timing of works should be better justified and tested before it is used to confirm specific projects within the strategy.

Jacobs has assessed the prudence of the strategy against three key questions as outlined below:

What are the requirements for TasWater to provide treated water and how are these incorporated into the strategy?

Under the Public Health Act and the Tasmanian Drinking Water Quality Guidelines, TasWater is required to manage water in a manner that does not pose a threat to public health and comply with the Australian Drinking Water Guidelines.

As outlined in more detail below, the Regulator's requirements for approving service replacements, instead of water treatment schemes, include reference to cost as well as technical feasibility, stakeholder and customer consultation and legislative or regulatory requirements. Specifically, the Regulator's PSP Guidelines state that:

"Service replacement will only be permitted where there are environment or public health issues that need to be addressed and the cost of addressing those concerns through upgrades to the reticulated system is considered uneconomical."

Jacobs considers that the Strategy and associated assessment criteria should more strongly address both the public health risk requirements as well as potential trade-offs that may need to occur when water treatment schemes are considered uneconomic. At the moment it is not clear how the relative public health risks are being considered. It appears that the DHHS priority ranking as provided in the summary assessment (Attachment 1, Board paper 4 June 2014) does not influence the decision making process, with all systems not meeting public health requirements being treated with the same level of importance. The most influential criteria for decision making in the first instance is the \$20,000 cost threshold and other non-health related measures.

Does the strategy provide a robust framework for determining whether water treatment is economical?

TasWater's strategy and supporting information recognises that the Economic Regulator will only support service replacement if an upgrade is considered '*uneconomical*' and if it is satisfied that certain conditions are met (see text box below).

Economic Regulator's conditions for approving service replacements (PSP Guidelines, 2013)

The Economic Regulator will only approve a service replacement proposal if it is satisfied that:

- The proposal involves the replacement of the current reticulated service with another form of service provision
- The regulated entity has examined options other than service replacement, but that they were technically not possible or were impractical due to the costs involved (noting that costs can be determined in a number of ways, for example, capital cost per connection)
- The service replacement proposal has been discussed with, and is supported by, all relevant industry regulators, including the EPA, Director of Public Health and the Tasmania Fire Service and relevant planning authorities
- The regulated entity has consulted with affected customers (particularly any customers identified by the regulated entity under the requirements of the Code as being special needs customers) and the proposal has broad community support
- The proposal is consistent with any relevant legislative or regulatory obligations or government policy.

Given that the Economic Regulator has not defined what might constitute an '*uneconomical cost*' or '*broad community support*', it is critical that TasWater's Small Towns Water Supply Strategy clearly defines these boundaries.

Supporting information provided by TasWater (Steering Committee Paper: Assessment of justifiability of capital improvements - \$20,000 per connection threshold) defines '*uneconomic*' as "*constituting an inefficient use of money or other resources*", where inefficient can be

defined as “not achieving maximum productivity; wasting or failing to make the best use of time or resources”. Jacobs supports this definition which could be used to set the boundaries as to what is ‘economic’.

It appears that once a water supply system is identified as not meeting public health requirements, the strategy applies three high level measures of economic (or uneconomic) viability, the first being the number of customers affected (i.e. connections), the second being a cost per connection threshold of \$20,000 and the third being community needs and potential impacts of a reticulated service – including the needs of growing and present population, the impact on social infrastructure, industry and tourism as measured by the key assessment criteria. Whilst TasWater has advised that these non-health factors were initially raised by DHHS, the basis for these measures has not been provided. Further, their application does not measure relative economic value between towns.

More specifically:

- **The \$20,000/connection has not been adequately justified or tested.**

The threshold is based on that used by Ben Lomond and has not been tested further. It is understood that this threshold was based on the Board feedback on a 2010 paper that considered the cost of providing treated water supply to systems in the region on permanent boil water alerts. [REDACTED]

Jacobs is concerned that the \$20,000 threshold has not been adequately justified or tested by TasWater. It is noted that the Steering Committee Paper refers to an example from SA Water which applied a similar threshold to a small desalination plant servicing 200 customers. However it is unclear what the overall impact of this option was on water prices for that community or South Australian customers more generally. Other appropriate benchmarks should therefore be considered in establishing this threshold.

In its response to the draft report, TasWater provided some additional commentary on the adoption of the \$20,000 threshold by estimating that that Ben Lomond Water would expect a revenue of close to \$20,000 per equivalent tenement (ET) over the useful life of a given upgrade (based on \$466 per ET for 42 years). However Jacobs does not believe that this calculation provides any further comfort for the selected threshold. Firstly, the cost of any upgrade option should include the discounted whole of lifecycle cost (capital and operating costs). Secondly, any consideration of revenue potential should be based on the discounted revenue, which for this example is approximately \$8,000 per ET.

Jacobs considers that a TasWater should select a threshold that is based on reasonable impact on prices, which considers the whole of life capital and operating cost of the solution as well as the existing regional price impacts and the future State-wide postage stamp pricing impacts. This threshold should also be informed by customer consultation.

- **The basis of the key assessment criteria which included number of connections, premises occupied, growth and demographics, social and industry services and tourism route has not been provided.**

It is not clear whether or how these criteria are used to determine if water treatment is economical. The Framework should be transparent about the definition of these criteria and the rationale for their application.

- **The framework does not provide guidance for prioritisation of each water treatment system.**

Each assessment criterion is treated with equal importance and there is no measure of value for money which considers the need against the cost. Further, the DHHS prioritisation does not inform the strategy in a meaningful way. As such, there is no way to compare costs and benefits across all the systems.


Jacobs considers that the current framework is inadequate to inform decision making and that a prudent framework should address the above issues.

Jacobs understands that TasWater is still developing a final Small Towns Water Supply Strategy which will include the results of the detailed engineering and social assessment to support the preferred solution. However this strategy is not available for the review, and has therefore not informed TasWater’s decisions already included in the PSP.

Does the strategy provide a robust framework to inform prudent timing of expenditure?

The Strategy and assessment criteria categorises each water treatment system but does not rank them in a way that informs prioritisation and timing of the investments. Given the extended roll-out likely for the entire small towns program, a process is needed to prioritise expenditure within and between regulatory periods. Without this framework, it is not possible to determine whether the proposed timing of the small town water supply capital expenditure for individual projects within the PSP2 is prudent.


Prioritisation should be based on the assessment criteria which take into account the relative health risks, costs and pricing impacts of the system, broader economic benefits and community benefits of the project, as well as community support.

Is the project efficient?	Jacobs Assessment:	
<p>The use of a robust Small Towns Water Supply Strategy informs the prudence of individual water treatment system or replacement service investments and should also inform the relative timing of investment. Therefore, apart from informing the decision of whether a water treatment or replacement service is warranted, it does not inform the selection of the least cost option of the preferred solution. As such, it is not relevant to assess its efficiency.</p>		
<p>Recommendations</p>		
<p>Jacobs recommends that prior to solely depending on the Strategy to inform prudence of capital expenditure, that TasWater strengthens the framework by:</p> <ul style="list-style-type: none"> • Placing greater emphasis on the health requirements and risks in the assessment criteria; • Reviewing the cost threshold and providing a strong rationale for its use (e.g. impact on price, other benchmarks); • Providing the basis for using any assessment criteria, including how each criterion is a measure of economic efficiency and potentially allocating weightings to each criterion (even if of equal importance); • Considering the systematic use of community support within the framework to inform economic efficiency • Providing a framework for prioritising works within and between categories. For example, ranking using a metric of weighted benefit score (with reference to the criteria) per price impact. <p>Until the Small Towns Supply Strategy is strengthened (as per the above), it is recommended that the prudence and efficiency of each proposed water treatment be assessed on a case by case basis. Whilst the current strategy can be referred to at a high level for prudence assessments, the existing framework should not be used as the sole justification for 'prudent expenditure'.</p>		
<p>Assumptions</p>		
<p>It is assumed that the Strategy is used by TasWater as the primary measure of prudence in its capex proposals for small town water treatment plants.</p>		
<p>Reference Documentation</p>		
<p>Jacobs has relied on the following documentation in its review:</p> <ul style="list-style-type: none"> • TasWater Draft Price and Service Plan 2015-18, August 2014 • Small Towns Water Supply Strategy, 4 June 2014 • Appendix 1 : Assessment of Water Supply Systems as per Water Quality Policy and Decision Flowchart • Appendix 2: Current Approved Water Quality Policy and Decision Flowchart, June 2014 • Steering Committee Paper: Assessment of justifiability of capital improvements - \$20,000 per connection threshold • TasWater response to project assessment (2014) 		

B.10 King Island Water Infrastructure Upgrade Program

Project Name	King Island Water Infrastructure Upgrade Program
Primary Driver	Compliance
Organisation	TasWater
Service	Water
Project Type	Proposed
Jacobs Review Number	Project 10

TasWater proposed CAPEX Budget (nominal)							
FY12/13	FY13/14	FY14/15	FY15/16	FY16/17	FY17/18	Beyond	Total
-	-	-	\$15.8M	-	-	-	\$15.8M

Project Description		
<p>TasWater operates two reticulated water schemes on King Island, Currie and Grassy. Currie's scheme supplies raw water that is chlorinated, un-fluoridated and does not comply with the Tasmanian Drinking Water Quality Guidelines (TDWQG) whilst Grassy's scheme is fully treated.</p> <p>The project with a pipeline connecting Grassy and Currie. The project is proposed to involve the construction of a new 1.0 ML/day water treatment plant (WTP) at Grassy, a new raw water pump station and rising main, raising of the dam wall at Grassy Dam to gain ANCOLD compliance, and construction pipelines and reservoirs to service both Currie and Grassy.</p>		
Is the project prudent?	Jacobs Assessment:	
<p>Jacobs considers that the King Island Water Infrastructure Upgrade Program is prudent. Based on the evidence cited, it is consistent with delivering TasWater's (previously BLW's) required obligations and level of service requirements and could be reasonably be expected to be undertaken by an operator exercising good industry practice.</p> <p>Project need: The Currie Water Supply System does not comply with the TDWQG, specifically hardness values exceeding 200mg/L. It was included as a Priority 1 system in the 'DHHS Priority List – Drinking Water Supply Systems – 2014' issued by the DHHS on 18 February 2014 and as such the need for the project is considered to be mandatory. It is understood that the assets within the Grassy Water Supply Scheme are at the end of their design life requiring replacement and that there are WHS issues associated with the existing infrastructure. An overarching compliance driver is that the Grassy Dam occasionally experiences algae blooms and the "water treatment" plant has a limited PAC dosing ability to assist when an outbreak occurs. The Grassy scheme was not included on the DHHS Priority List and as such the requirement to upgrade the system is not considered mandatory.</p> <p>Cost driver allocation: Jacobs agrees that there are multiple cost drivers for this project aligned with the Ring Fencing Guideline – including compliance and renewals. It is Jacobs' opinion that the primary driver is compliance.</p> <p>Project timing: The inclusion of the project within the PSP2 expenditure program is consistent with TasWater's risk-based capital prioritisation process. The project business case was developed in April 2014 and approved by the Board in August 2014.</p> <p>Planning horizon: Growth and demand estimates that have been used to size the infrastructure appear to appropriate. Water demands were developed based on the following:</p> <ul style="list-style-type: none"> • Average Demand: Grassy = 270 L/person/day; Currie = 286.71 L/person/day (actual demands from 2011) • Combined Average Day Demand (ADD) = 447.4 kL/day • Peak Day Demand (PDD) = 1,006 kL/day • Population for the whole King Island (1,703) as at 30 June 2006 with no growth assumed. <p>The treatment plant had the following design basis:</p>		

- Hydraulic capacity = 16 L/s
- Operational hours for ADD = 8 hours (460 kL/day)
- Operational hours for PDD = 18 hours (1,000 kL/day)

While Jacobs considers that the methodology used for the for the development of the demand and treatment plant sizing are appropriate, it is noted that they were developed in 2012, with 2006 population figures and do not incorporate the Scheelite mine. The King Island Scheelite Dolphin Project Manning Schedule is indicated as having a maximum occupancy of 168 people. Based on the above numbers with the addition of the Scheelite mine population, an ADD of approximately 505 kL/day and a PDD of 1,137 kL/day could be required. It is noted that the plant is intended to be modular to allow for demand fluctuations, i.e. to provide flexibility and cost efficient plant capacity expansion if the plant does not proceed.

Deliverability: The work plan outlined in the Business Case appears to be reasonable for the works required. The project is to be delivered over the 2014/15 and 2015/16 financial years with the majority of the expenditure anticipated in the 2015/16 financial year.

Is the project efficient?

Jacobs Assessment:



Based on the evidence provided, Jacobs find that the expenditure currently proposed to be efficient and is considered to be the minimum level of expenditure that is required to deliver the desired outcome or result consistent with an operator exercising good industry practice.

Options assessment and selection of the preferred option: A number of options were considered in the initial business case (2012):

- Option 1 - Minimum required meeting OH&S objectives and replacing older infrastructure
- Option 2 - Rainwater Tanks
- Option 3 - Remediate existing infrastructure and install WTP and Bore field at Currie
- Option 4 - Separate Systems
- Option 5 - One Plant & Pipeline
- Option 6 - Install 1.0ML/Day at Grassy
- Option 7 - Install 1.0ML/Day Nano Treatment plant at Currie - Netherby Rd
- Option 8 - Install 1.0ML/Day WTP Nano Treatment plant at Currie - Admirals Beach

Each of these options considered the capital cost (including contingency), the ongoing operating costs, the security of supply from the water source, the surety of compliance with the ADWG obligations, fire-fighting requirements and OH&S obligations. Option 5 (One Plant & Pipeline) was identified as the preferred option.

The subsequent business case (2014) only considered options which fully addressed the project objectives of TDWQG compliance and subsequently the Cradle Mountain Water Drinking Water Quality Management Plan, and security of source water supply. The practicable options were then narrowed to:

- Option 1 - Separate Water Treatment Plants at Grassy and Currie and a new bore field at Currie.
- Option 2 - One water treatment plant and a pipeline between Grassy and Curry together with minor reticulation upgrade.

Option 2, incorporating the raw water rising main and pumps station upgrade at Grassy, new 1 ML water treatment plant at Grassy, reservoirs, and a pipeline and reservoirs between Grassy and Currie, was identified as the preferred option as it had the lowest capex and provides the best NPV of the viable options assessed.

The cost estimate in the most recent business case was based on the estimates from the 2012 business case, escalated to 2014 dollars. The initial cost estimate was developed from budget estimates from suppliers and unit rates from previous similar works. As per the initial business case a 20% remote area uplift and a 30% contingency allowance were applied.

Jacobs considers the methodology used for the development of the cost estimates to be appropriate for the stage of the works. Jacobs would expect the works to be competitively tendered and therefore market tested as the project progresses. It is understood that the basis of the 20% remote uplift fee is the experience of completing projects on the island and previous project over runs. TasWater has advised that "at the time of writing" its Board has mandated that all business cases must have a consistent 30% contingency allocated. Jacobs is unclear whether the "at the time of writing" applies to the original business case or to the current business case. Jacobs considers that the contingency allowance could (and probably should) have been revised down during development of the new business case.

Procurement Approach: The Work Plan in the Business Case indicates that the works will be delivered through four separate contracts: the pipelines and pump stations, the WTP, the Currie reticulation system, and the Grassy Dam wall raising. In response to Jacob's RFI, TasWater indicated the tendering has not been initiated at this stage but it is proposed to tender the WTP and pipeline contracts separately. In addition, TasWater is currently embarking on a significant capital works program which will be utilising many local contractors, the availability of these contractors for specific works will likely require TasWater to engage possibly mainland contractors for this work.

Recommendations

In summary, Jacobs considers that the King Island Water Infrastructure Upgrade Program is prudent. Based on the evidence sighted, it is consistent with delivering TasWater's (and predecessor BLW's) required obligations and level of service requirements could be reasonably expected to be undertaken by an operator exercising good industry practice.

Jacobs considers the methodology used to develop the cost estimates to be appropriate for the current stage of the project but would expect it to be market tested as the project progress to ensure that the minimum level of expenditure required to deliver the desired outcome is obtained.

Assumptions

None

Reference Documentation


Jacobs has relied on the following documentation in its review:

- King Island Water Infrastructure Upgrade Program Business Case, Version 0.3, TasWater, 2 April 2014
- 14 15913 DHHS Draft Priority List Summary - Drinking Water Supply Systems 2014.pdf
- CMW - Tag 7 - KI Business Case Attach 1 - September 2012.docx
- CMW - Tag 7 - King Island Peer Review Final Report Mott McDonald Attachpdf
- CMW - Tag 7 - King Island Water Infrastructure Upgrade Program - Septemb....docx
- Currie_Grassy Demand Data.xlsx
- Currie-King Island Water treatment Proposal Rev0 13-08-2012 _2_ Stornoway.PDF
- Grassy Dam Storage Requirements.pdf
- Grassy Dam Water License Request Calc s.XLS
- Hunter Water Infrastructure Audit-King Island.pdf
- Jacobs RFI-8 CAPEX - Project 10 King Island Water Infrastructure Upgrade.docx
- NPV-KI Water Infrastructure Upgrade Business Case 2014 Rev 6.XLSX
- priority list CMW - signed Jan 2010.pdf
- Scheelite Mine Workforce Predictions.pdf
- TRIM King Island Pricing .msg
- Upper Grassy Dam Storage Estimation and Upgrade Options Study - 150811.pdf

B.11 Sewerage Treatment Inlet Works Program (Southern Region)

Project Name	Sewerage Treatment Inlet Works
Primary Driver(s)	Compliance and Improvement
Organisation	TasWater (originally proposed by Southern Water)
Service	Wastewater
Project Type	Budgeted
Jacobs Review Number	Project 11

TasWater CAPEX Budget (nominal)							
FY12/13	FY13/14	FY14/15	FY15/16	FY16/17	FY17/18	Beyond	Total
-	\$0.25M	\$2.0M	\$2.38M	-	-	-	\$4.63M

Project Description		
<p>Inlet works (screens and/or grit removal) are typically installed at STPs as an operational necessity to protect downstream mechanical equipment and treatment processes. A large proportion of TasWater's STPs do not have adequate inlet works to properly remove screenings/rags/grit from the raw wastewater as part of the wastewater pre-treatment process. As a result, these plants experience higher WHS risks, environmental risks, and operational risks/issues.</p> <p>This project is a program of works to install/upgrade the inlet works at 11 STPs that have been classified as high or medium risk. The program aims to improve compliance of the STPs with safety and environmental regulations and will include installation of automatic screens and bypass manual screens (or automatic standby screens), 4 grit removal systems, 3 odour control system, 4 flow meters, new electrical equipment, and new PLC/SCADA control systems for new Inlet Works.</p>		
Is the project prudent?	Jacobs Assessment:	
<p>Based on the information provided, particularly around the Options Assessment process it is Jacobs' assessment that the inclusion of 9 of the 11 STPs nominated by TasWater are prudent – based on the information provided Swansea STP and Triabunna STP have not been sufficiently demonstrated as prudent. More substantive evidence to demonstrate the need for capital works at Swansea STP and Triabunna STP would be required to assess the inclusion of these sites in the program as prudent.</p> <p>The program of works to upgrade/install inlet works at 11 STPs in southern Tasmania is driven by compliance and improvement – this aligns with TasWater's corporate strategic direction and long-term planning. The programs aims to address issues associated with WHS risks, environmental risks and operational risks.</p> <p>Inclusion of only Southern Region STPs: This program was originally a Southern Water program that has been reappropriated into a TasWater program. As a result, the 20 shortlisted STPs included in this assessment are all located in the Southern Region of Tasmania. TasWater has indicated that STPs in the Northern and North Western Regions were not retroactively included in the program as these regions had already undergone inlet screen programs under their legacy organisations – Ben Lomond Water and Cradle Mountain Water. Evidence of these programs has not been sighted so it is unclear to what extent they were undertaken and if there are any on-going or residual risks that need to be addressed in these regions. While this is noted, TasWater's inclusion of only the 20 STPs shortlisted by Southern Water in their assessment is considered reasonable.</p> <p>Risk Assessment and Project Prioritisation: TasWater has noted that there are existing compliance issues with EPN and WHS requirements. However, based on discussions with TasWater it appears that no STPs have a mandate from a technical regulator (i.e. EPNs) to undertake capital works related to the upgrade/installation of inlet screens at STPs. Therefore, based on evidence sighted it is unclear which STPs (and how many) are non-compliant and to what extent they are non-compliant. While this is noted, TasWater has nevertheless demonstrated sufficient rigour in the needs identification process to provide confidence that the program of works is needed.</p> <p>In assessing prudence it also noted that implementation of this program of works has been brought forward to compensate for delays with</p>		

other projects (i.e. to spend funds already budgeted).

GHD was engaged in 2013 to undertake risk and equipment assessment studies for the 20 STPs originally identified by Southern Water and the outcomes of these studies are detailed in the '*STP Inlet Works Program Concept Design Report*'.

GHD also performed an assessment of the need for capital investment at each of the 20 STPs. The approach of assessing each project/STP individually provides confidence that (a) the needs for capital works are properly identified; and (b) the individual projects are suitably prioritised. GHD's assessment included:

- Site visits and operator interviews to identify WHS risks at each of the 20 STPs assessed.
- A risk based prioritisation of the 20 STPs to identify which STPs were most in need of capital works. Individual risk assessments, which were largely qualitative, were conducted for each STP and done in collaboration with operators.

STPs classified as Medium or High Risk (i.e. those included the program of works) include those that:

- Achieved an 'intolerable' risk score for one of the 16 risk categories assessed – which incorporated WHS, environmental and operational risks. The 'intolerable' risk levels were qualitative measures and were based on discussions with plant operators. These levels are defined in Section 2.2 of '*STP Inlet Works Program Concept Design Report*'; AND/OR
- Had an aggregated risk score (i.e. overall weighted risk) greater than 3.

While there is a clear systematic approach in the risk assessment; the following items, which could potentially impact the prudence of individual STP projects, were noted:

- No sensitivity was undertaken to provide additional confidence that the most appropriate projects are included in the program
- The risk assessment is skewed toward scoring STPs with existing screens higher than STPs without existing screens. This is a result of STPs without existing screens not being able to score highly in WHS risk. Therefore, most of the high risk STPs have existing screens and are differentiated by high WHS risks. TasWater have noted that this was purposeful and was in recognition of "the additional risks posed by existing screens". Jacobs agrees that this is reasonable.
- It is unclear how rigorously the levels of tolerable risk were tested.
- The risk categories assessed do not align with TasWater's '*Enterprise Risk Management Framework*', although it is noted this framework was not prepared at the time of the risk assessment.

Options Assessment – Inclusion of High and Medium Risk STPs (11 Total) in Program: The business case presents a high level overview cost/benefit (risk reduction) analysis and NPV comparison of four options – (1) do nothing, (2) inlet works at all 20 STPs, (3) inlet works at 6 high risk STPs, and (4) inlet works at 11 medium and high risk STPs.

Based on information presented in the Business Case and garnered through discussions with TasWater, it is broadly understood that the options assessment (i.e. which STPs to include in the program) was based on project risk, value for money, and discussions with plant operators. As a result of this assessment TasWater has designated that capital works are required at all STPs with medium and high risk ratings (i.e. Option 4). However, as supporting evidence for this options assessment was not sighted the following is still unclear:

- The basis for the scoring and ranking of the considered options (i.e. the calculation of the mitigated risk scores, whether the benefits listed for each option were assessed/quantified for each STP, how the risk costs were calculated, etc.).
- Why the preferred option includes upgrades at high and medium risk STPs (but excludes works at Low risk STPs). It is noted that the medium risk STPs have the lowest NPV, but they are still negative. It is unclear from information/analysis presented in the business case why the selected cut-off point has been adopted.

Given this, there is not sufficient evidence to assess the inclusion of all 11 STPs for capital upgrades as prudent. Based on evidence sighted it is Jacobs' opinion that capital works are prudent for 9 of the 11 STPs nominated by TasWater – with 2 of the medium risk STPs being classified as not prudent (refer to table below).

Swansea STP and Triabunna STP are assessed as medium risk and as a result were included in the program by TasWater. While it is noted that TasWater held discussions with plant operators to confirm the inclusion of these plants in the program, this is not considered sufficient evidence to support their inclusion in the program.

It is Jacobs' opinion that sufficient evidence to demonstrate prudence for these 2 STPs was not provided. Based on evidence sighted these STPs do not have a sufficiently demonstrated need (i.e. WHS, environmental, and/or operational risks), do not offer sufficient value for money, and/or do not offer other compelling benefits to warrant capital works as part of this program. Further discussion for these STPs is provided below.

No.	STP	Risk Rating	Jacob's Prudency Assessment
1	Risdon Vale	High	Yes
2	Turriff Lodge	High	Yes
3	Sorell	High	Yes
4	Midway Point	High	Yes
5	Geeveston	High	Yes
6	Dover	High	Yes
7	Orford	Medium	Yes
8	Swansea	Medium	No
9	Bicheno	Medium	Yes
10	Triabunna	Medium	No
11	Oatlands	Medium	Yes

Swansea STP: The risk assessment of Swansea STP showed the plant does not have a single risk rated as 'intolerable' and has aggregated risk score of 3.1. Based on TasWater's criteria, this STP is on the cusp of whether it should be included in the program, as an aggregated risk score of less than 3 would have seen it excluded. While it is noted that a number of individual risks are approaching TasWater's 'intolerability' level (i.e. increasing the likelihood the project is needed), further evidence (i.e. sensitivity testing of the risk) is required to sufficiently demonstrate the need for capital works.

The project has a negative return on investment and no other sufficiently compelling net benefits have been demonstrated.

It is Jacobs' opinion (based on information sighted) that there is not a sufficient evidence available to assume the inclusion of this capital project in the program as prudent.

Triabunna STP: This STP has an aggregated risk score less than 3. However, as it has one intolerable risk it is classified as medium risk and has been included in the program. This lone intolerable risk relates to the frequency of operator maintenance to remove screenings, which is currently somewhere between weekly and daily. Therefore, it appears the key driver for the works is reduced maintenance requirements/frequency.

It is Jacobs' opinion that maintenance requirements/frequency is not an intolerable risk. Therefore, the decision to undertake capital works should be based on economic benefit rather than risk, which is the basis on which TasWater have included it in the program. Given this, and noting the project has a negative NPV of over \$0.8M (which includes savings in maintenance, labour, etc.), these capital works are not considered reasonable from a solely economic standpoint.

Therefore, as no clear cost benefits have been demonstrated, and noting that this project is an improvement activity (i.e. discretionary drivers), it is Jacobs' opinion, based on the evidence sighted, that the inclusion of this project in the program is not prudent.

Bicheno STP and Oatlands STP: These STPs have similar (or lower) aggregated risk scores to Triabunna STP and, like Triabunna STP, also have few individual intolerable risks (Bicheno – 3, Oatlands – 1). However, unlike Triabunna, in these cases Jacobs agrees that the intolerable risks are in fact intolerable and therefore the need for capital works is a risk based decision (rather than an economic one). Given TasWater's inclusion of these projects was a risk based decision, it is our opinion that capital works at both of these STPs is prudent.

Is the project efficient?

Jacobs Assessment:



Based on the evidence provided, Jacobs find that the expenditure currently proposed to be efficient and is considered to be the minimum level of expenditure that is required to deliver the desired outcome or result consistent with an operator exercising good industry practice.

Cost Estimations: GHD's assessment (see '*STP Inlet Works Program Concept Design Report*') helps demonstrate that the cost estimation for the individual projects, and subsequently the program, are robust. This is achieved through:

- Demonstrated consideration of the specific design requirements (i.e. capacity, equipment sizing and selection, etc.) for each individual STP. GHD's assessment provides confidence that specific requirements at each STP were identified and incorporated into the cost estimating process.
- OPEX estimates that were developed include input from the current plant operators.
- Detailed and robust capital cost estimates and NPV calculations for each of the 20 STPs. This provides assurance that costs estimates for the program are sufficiently accurate.

The level of detail available in this case is less than would be expected in a standalone project. However, this is expected and this efficiency assessment was done while recognising this is a program of works and the level of detail available is typically lower for individual projects as part of a program.

The cost estimate provided in 'B14 160738 Capital Works Program PSP Version' is \$4.63M compared with \$5.5M in the business case. This reflects an adjustment in the contingency from 30% in the business case down to 10% for project delivery. A contingency of 10% at the project delivery phase – which is where this program currently lies – is reasonable and consistent with our understanding of TasWater's planning and delivery framework.

Delivery as a Program of Works: In implementing a program of works TasWater expects to achieve efficiencies through scales of economy and commonality of equipment. For example, it would be expected that TasWater would realise savings through procurement (e.g. purchasing multiple screens at once) and overheads (e.g. the program is being delivered as a single D&C contract as opposed a number of smaller contracts) as part of a program of works. While no evidence has been sighted in support of this (i.e. historical programs with demonstrated savings) and the magnitude of savings/efficiencies is unclear, this is a reasonable assumption and is considered an efficient structure for delivery of the capital works.

Recommendations

As discussed above, it is Jacobs' opinion that only 9 of the 11 STP projects nominated by TasWater are included in the PSP2 pricing submission, therefore the costs of the works at Swansea STP (\$361,000) and Triabunna STP (\$367,000) should be backed out from the program expenditure, reducing it from \$4.63M to \$3.90M nominal.

Only \$2.38M of the program expenditure is included in TasWater's draft PSP2 submission, the remaining \$2.25M was planned expenditure for PSP1. The timing of the works at specific sites has not been provided and so Jacobs is unable to determine how much of the \$728,000 to be backed out for Swansea STP and Triabunna STP should be removed from TasWater's capital expenditure submission for PSP2.

Assumptions

Note any assumptions made by Jacobs during the review

Reference Documentation


Jacobs has relied on the following documentation in its review:

- Doc 70.11 - CWC - Tag 12 - Sewage Treatment Plant Inlet Works Program Business Case
- STP Inlet Works Program Concept Design Report'
- CWC - Tag 12 - Sewage Treatment Plant Inlet Works Program Business Case (Attachment 2) ~ July 2013
- CWC - Tag 12 - Sewage Treatment Plant Inlet Works Program Business Case (Attachment 3) - July 2013
- B14 160738 Capital Works Program PSP Version

B.12 Ouse & Hamilton Water Supply Upgrade

Project Name	Ouse and Hamilton Water Supply Upgrade
Primary Driver	Compliance
Organisation	TasWater (originally proposed by Southern Water)
Service	Water
Project Type	Budgeted
Jacobs Review Number	Project 12

TasWater CAPEX Budget (nominal)							
FY12/13	FY13/14	FY14/15	FY15/16	FY16/17	FY17/18	Beyond	Total
-	\$4.24M	-	-	-	-	-	\$4.24M

Project Description		
<p>The townships of Ouse and Hamilton are located approximately 16km apart in the Central Highlands Council local government area. There are currently 164 connections in Ouse and 157 connections in Hamilton, with a combined estimated peak daily demand of approximately 0.8 ML/day. In addition to the populations of Ouse and Hamilton are predicted to grow by 16% over the next 30 years (refer to project Business Case). This is equivalent to an annual growth rate of 0.5% and an additional 52 tenements.</p> <p>Both towns have historically poor water quality performance and are each periodically subject to temporary Boil Water Notices (BWN). Both are chlorination only systems that draw raw water from uncontrolled catchments which were ranked 1 and 2 respectively in risk terms in Southern Water's Compliance Implementation Plan. Both catchments contain high levels of agricultural and recreational activity and have a high risk of faecal contamination. Both towns have also had detection of Disinfection By-Products (DBPs) – which are considered potentially carcinogenic for long-term exposure – with Ouse having 7 DBP failures in 2013-14 and Hamilton having 5.</p> <p>Southern Water's Drinking Water Management Plan listed both Ouse and Hamilton as “very high” priority upgrades, ranking them as the number 3 and 5 priority upgrades out of 38 drinking water system upgrades. The Department of Health and Human Services (DHHS) also wrote to Southern Water on 12 August 2011 stating that both Ouse and Hamilton ‘need full water treatment.’ The importance of reliable, quality water in both towns was highlighted by DHHS, who noted that Ouse contains the district hospital (with aged care facilities) and school, and that Hamilton is a significant tourist stop on the Lyell Highway with a number B&Bs.</p> <p>Southern Water's (and now TasWater's) proposed solution is install a new WTP in Ouse and the transfer treated water to Hamilton via a new pipeline that follows the Lyell Highway road reservation. The project also requires the construction of a new water pumping station in Ouse to transfer the water to Hamilton. The solution sizing has been based on projected 30 year peak daily flows (0.97ML/d), and provides capacity to supply 27 additional properties along the pipeline route.</p> <p>This project forms part of the Small Towns Water Supply Program, which was a priority in Southern Water's 2012-2015 Corporate Plan, and was included as part of PSP1. The project intends to address existing public health risk, improve the level of service in both towns, and achieve compliance with ‘<i>Australian Drinking Water Guidelines 2013 (ADWG)</i>’.</p>		
Is the project prudent?	Jacobs Assessment:	
<p>Jacobs finds that this project is prudent on a needs basis. It is aligned with TasWater's key drivers and obligations, and could be reasonably expected to be undertaken by an operator exercising good industry practice given the circumstances of TasWater at the time the decision was made. While there have been delays the project is still expected to achieve practical completion by early 2015 so no expenditure should be spent in the PSP2 period.</p> <p>Project need and timing: The ‘<i>Public Health Act 1997</i>’ states that TasWater must manage water supply in a manner that does not pose a threat to public health, and must provide potable water that complies with the health guideline values contained within ADWG. TasWater and the DHHS recognise that the water supply systems of Ouse and Hamilton are inadequate and non-compliant with the ADWG.</p> <p>Southern Water's Drinking Water Management Plan listed both Ouse's and Hamilton's water supply system as “very high” priority</p>		

upgrades, ranking them as the number 3 and 5 priority upgrades out of 38 drinking water system upgrades.

In a February 2014 letter from the DHHS, both towns were identified as a medium priority (2 out of 3) on their list of non-compliance or inadequate drinking water supply systems that required attention. Additionally, the DHHS had also previously written to Southern Water on 12 August 2011 stating that both Ouse and Hamilton were in 'need full water treatment'.

Jacobs agrees that the 'do nothing' solution is not acceptable and there is a clear regulatory need for TasWater to take action to resolve the inadequate current performance and non-compliances of the water supply systems for Ouse and Hamilton.

Cost Driver Allocation: Jacobs agrees that project is aligned with the Ring Fencing Guideline and that the primary driver is compliance.

Project Timing: Jacobs agrees that this project should be included in TasWater's capital expenditure program for the current PSP. The inclusion of the project is consistent with TasWater's risk-based capital prioritisation process, which notes their decision to continue with delivery of compliance commitments made by its legacy regional organisations (see Section 5.4.4 of 'Doc 43 Capital Projects Prioritisation Procedure v3').

Growth and Demand Estimates: It is Jacobs' opinion that insufficient evidence has been provided to confirm the robustness of the growth and demand estimates that have been used to size the infrastructure (i.e. the WTP and pipeline) for a 30 year planning horizon.

TasWater has indicated that 0.5% p.a. growth is expected for the both towns for the next 30 years. TasWater has supported this assumption with 10-year historical data sourced from the ABS. However, as this data indicates that growth rate has been declining – from 1.4% p.a. 10 years ago to 0.2% p.a. two years ago – more justification should be provided in support of the assumption that future growth in these towns will match the state-wide average of 0.5% p.a. listed in PSP2.

Deliverability: The project business case was initially developed by Southern Water but was not approved by its Board. It was subsequently approved by the TasWater Board. The business case indicated the project was scheduled for completion in early 2014. However, based on discussions with TasWater the project has been delayed approximately one year as a result of (a) a longer than expected approvals process and (b) a second tendering process due to a lack of suitable responses in the first tendering process.

Based on discussions with TasWater the WTP and pipeline contracts were awarded in July 2014 and September 2014 respectively. Assuming the construction timeline provided in the business case is accurate (6-9 months from contract award to project close out), TasWater's expectation that the project will achieve practical completion in early 2015 – prior to commencement of PSP2 – is reasonable. Given this, Jacobs agrees that the project should not be included in PSP2 and no amendment to proposed expenditure for PSP2 is recommended.

It is noted that these project delays are not reflected in TasWater's *B14 160738 Capital Works Program PSP Version* which lists the entire total capital expenditure of \$4.24M to occur in 2013/14. Given this, and that completion is expected in early 2015, it would be expected that the vast majority of this expenditure will occur in the 2014/15 year rather than 2013/14.

Additionally, it is noted that several historical/budgeted projects have experienced similar delays, and based on discussions with TasWater these 'lessons learnt' have been incorporated in the work/program planning for projects proposed for PSP2. This provides a somewhat enhanced confidence that the future projects will be deliverable within proposed timelines.

Is the project efficient?

Jacobs Assessment:



Jacobs finds that this project is efficient. Jacobs considers that TasWater's proposed solution is consistent with an operator exercising good industry practice.

Options Assessment and Cost Estimates: It is Jacobs' opinion that sufficient evidence has been provided to support the robustness of the options assessment and selection of preferred option. The options assessment was undertaken by Southern Water and included the engagement of two external consultants, SKM and JME.

The business case presents a high level overview of the options assessment for the three options considered.

1. Do nothing.
2. Two new WTPs. One each in Ouse and Hamilton.
3. A new WTP in Ouse and the transfer of treated water to Hamilton via a new WPS and pipeline (Preferred)

Southern Water's assessment included an NPV analysis of two options (the do nothing option was considered unacceptable) based on the recommendations of the consultant. The consultants were engaged to provide concept designs for the WTP and pipeline, and to conduct options analysis for the preferred site for both potential WTPs and identify preferred routes for the pipeline.

The two reports provided by the consultants ('*Small Towns Report Hamilton-Ouse Final_04-10-12*' and '*Final Preliminary Design Report (JMG)*') present a systematic approach and thorough consideration of various solutions (i.e. multiple WTP technologies, quantities, and locations; multiple pipe routes and diameters), review of other factors (i.e. potential cultural/heritage, ecological, and/or geological issues; reuse of existing infrastructure; community preference), and robust cost estimates and NPV analyses (i.e. bottom-up cost estimates with detailed breakdowns; unit rates for equipment based on market pricing; estimates sensitivity checked with similar recently constructed

WTPs and pipelines).

TasWater's preferred option (Option 3) has the higher capital cost but lower NPV. However, it is noted that while there is some brief qualitative discussion around the risks and benefits for each option, the options analysis presented in the business case is based on purely on financial criteria. While this is noted, it is Jacobs' opinion that sufficient evidence has been provided to demonstrate a robust options assessment and selection of an efficient solution.

Procurement Approach: The business case indicated that the capital works will be divided into two packages for competitive tender – one for the WTP and one for the pipeline and WPS. Separate procurement methodologies have been adopted for the WTP (D&C) and the pipeline and WPS (Detailed Design and Construction) to best suit the nature of, and risks associated that infrastructure. It is also recognised that the WTP contract includes a process guarantee and the selection of WTP technology – either Dissolved Air Flootation and Filtration or Microfiltration – is up to the contractor as both were considered technically suitable as part of the options assessment.

The division of the packages and procurement methodologies adopted appears reasonable and is considered by Jacobs as an efficient structure for the delivery of the project.

Recommendations

As discussed above, it is Jacobs' conclusion that this project is both prudent and efficient. However, as noted, there have been delays of approximately one year that are not reflected in TasWater's *B14 160738 Capital Works Program PSP Version* which lists the entire total capital expenditure of \$4.24M to occur in 2013/14. Given the current project status, and that completion is intended in early 2015, Jacobs expects that very little expenditure would have occurred in 2013/14 and that the vast majority of expenditure will occur in the 2014/15. While this will not impact PSP2 it is recommended, for completeness, that TasWater's expenditure profile is updated to reflect this.

Assumptions

Jacobs has assumed the construction timeline presented in the business case is accurate and reasonably achievable (approximately 6-9 months from contract award to project close out) although it is likely to be at the outer limit of this range. As a result Jacobs has concluded that TasWater's expectation that the project will achieve practical completion in early 2015 – prior to commencement of PSP2 – is reasonable.

Reference Documentation


Reference documentation used in the review of this CAPEX project:

- Doc 70.12 - SW - Tag 17 - Ouse Hamilton Water Quality Improvement Project
- DHHS Advice 12 Aug 2011
- B14 160738 Capital Works Program PSP Version
- Doc 43 Capital Projects Prioritisation Procedure v3
- TasWater Draft Price and Service Plan 2015-18 (August 2014)
- Public Health Act 1997
- Australian Drinking Water Guidelines 2013
- Ring Fencing Guideline
- Small Towns Report Hamilton-Ouse Final_04-10-12
- Final Preliminary Design Report (JMG)
- TasWater's response to VW07643_RFI_17_CAPEX_Ouse_Hamiltons_Water_Supply_Upgrade

B.13 Burnie Lion Trade Waste Network and WWTP upgrades

Project Name	Burnie Lion Trade Waste – Network and WWTP Upgrades		
Primary Driver	Growth	Secondary Driver(s)	Compliance Replacement/Renewal
Organisation	TasWater		
Service	Wastewater		
Project Type	Budgeted		
Jacobs Review Number	Project 13		

TasWater CAPEX Budget (nominal)							
FY12/13	FY13/14	FY14/15	FY15/16	FY16/17	FY17/18	Beyond	Total
-	-	\$5.04M	\$2.13M	-	-	-	\$7.17M

Project Description	
<p>The trunk sewerage network immediately upstream of the Round Hill (Burnie) waste water treatment plant (WWTP) has insufficient capacity to transfer all sewage from the upstream catchments to the WWTP. During wet weather sewage is lost from the network through overflows from upstream of the two major pump stations – Reeve Street SPS and River Road SPS.</p> <p>In addition to the existing sewerage network deficiencies, the Burnie Heritage Cheese Factory – operated by Lion Dairy and Drinks (LD&D) – has been instructed by the EPA (and in agreement with TasWater) to begin discharging all trade waste flows from the factory to Round Hill WWTP via the TasWater network from October 2015. LD&D currently irrigates its wastewater to land. This will ultimately (by April 2017) contribute an additional 0.9ML/d to the network and WWTP – taking the ADWF load from 6.1ML/d to 7ML/d. This will (a) exacerbate the existing network capacity issues and (b) create treatment capacity constraints at Round Hill WWTP. As a result, upgrades to both the network and WWTP are required.</p> <p>This project will provide upgrades to both the network and Round Hill WWTP. The upgrades will address existing network capacity issues and provide additional capacity to cater for the additional trade waste flows to be transferred transfer from LD&D. Works include:</p> <ul style="list-style-type: none"> - Upgrades to parts of the sewer network to increase capacity and reduce the amount of overflows. These include a new gravity main, two new SPS', new rising mains, upgrades to River Road SPS, upgrade of River road rising main, and a new 350m³ balance tank at the WWTP. - Upgrades/optimisation to parts of Round Hill WWTP to treat the additional trade waste flows while complying with existing EPN discharge limits. These include upgrades to chemical storage and handling, process modifications to increase sludge age from 30 days to 60 days, additional sludge handling, upgrade of aeration system, and upgrades to monitoring and control systems. <p>Development of this project has been a collaborative effort between TasWater, Burnie City Council (BCC), Department of Economic Development, Tourism and the Arts (DEDTA), EPA, LD&D, and the Australian Federal Government. The project is being funded with capital cost contributions from both TasWater (\$4.80M) and LD&D (\$2.37M).</p> <p>The viability of this project – which includes issues such as TasWater agreeing to accept trade waste flows from LD&D, TasWater agreeing to forego headworks charges, the amount of LD&D's capital contribution – appears to have some reliance on the award of a separate \$4.25M federally funded Storm Water Infrastructure Development Project administered by BCC which aims to reduce stormwater discharge to the sewer and free up additional sewerage network capacity. This storm water project began in 2012 and is expected to run for three years.</p>	
Is the project prudent?	Jacobs Assessment: 
<p>Jacobs finds that this project is prudent on a needs basis. It is aligned with TasWater's key drivers and obligations, and could be reasonably expected to be undertaken by an operator exercising good industry practice given the circumstances of TasWater at the time the decision was made.</p>	

Project need: Jacobs agrees there is a clearly demonstrated need for capital works to address growth (i.e. capacity) and compliance issues in both the sewerage network and at Round Hill WWTP.

Network: Based on information provided in the Business Case and in it is recognised that :

- the existing trunk sewerage network immediately upstream of the Round Hill WWTP has insufficient capacity to transfer all sewage from the upstream catchments to the WWTP;
- Reeve Street SPS and River Road SPS do not have sufficient capacity and overflow during wet weather events, and;
- These issues will only be exacerbated by the additional trade waste flows from LD&D

While no additional evidence and in particular no specific quantitative data on network overflow performance has been sighted (i.e. frequency/volume of overflows), Jacobs agrees there is a clear need – both from a growth and compliance vantage – to address these network issues.

Round Hill WWTP: Information presented in GHD’s report ‘Roundhill WWTP BioWin Modelling Report GHD Ref 3216613216993 December 2012 (Final)’ demonstrates a clear need to upgrade the treatment capacity at the WWTP to enable trade waste flows from LD&D to be accepted and to ensure future compliance with EPN license limits. The report indicates that the existing WWTP “could accommodate approximately 30% of the trade waste stream. However, the primary limitation is insufficient sludge handling (in particular the centrifuge) capacity to accommodate more than 5-10% of the trade waste stream”.

While no evidence of the specific assets replacement/renewals at Round Hill WWTP has been provided, it is agreed that undertaking replacement/renewals of such assets as part of the upgrades is an efficient approach.

Cost driver allocation: Jacobs agrees that there are multiple cost drivers for this project aligned with the Ring Fencing Guideline – including compliance, growth and renewals. Jacobs also agrees that the primary driver for this project is growth.

Estimated Demand

Impact of Trade Waste from LD&D: It is Jacobs’ opinion that sufficient evidence has been provided to confirm that the demand estimates and influent quality projections used to (a) size infrastructure and (b) define the nature of upgrades required at the WWTP are robust.

Two reports prepared by consultant GHD ‘Roundhill WWTP BioWin Modelling Report GHD Ref 3216613216993 December 2012 (Final)’ and ‘21326_Burnie Sewerage Network_Modelling Options Analysis_Final Report - Lion Burnie’ reasonably model the impact of the addition of LD&D’s trade waste on both the network and the WWTP.

Storm Water Infrastructure Development Project (i.e. Inflow and Infiltration (I&I) Reduction): The sizing of infrastructure for the network and WWTP upgrades has been based on the assumption that Storm Water Infrastructure Development Project will reduce I&I into the sewerage network by a significant amount, 1.9ML/d during wet weather.

While a review of this project (which commenced in June 2012) conducted in 2013 suggested the project was on track to achieve the expected volume reduction (see ‘Briefing Note - Lion Works External Contribution – Signed’), TasWater has indicated that it has some reservations whether this is accurate or realistic. This presents a potentially significant risk, as if the storm water project does not achieve the projected reductions this could require additional capacity requirements for both the sewerage network and the WWTP than currently assumed.

Deliverability: The project business case prepared by TasWater in April 2014 was approved by TasWater’s Board on 24 June 2014. The project is currently meeting its delivery timeline as set out in Table 6 of the Business case. TasWater has confirmed the project is expected to be completed on time – with construction complete by June 2015 and commissioning by October 2015.

Assuming the project actually meets the projected timeline it is Jacobs’ opinion that no additional expenditure – beyond the amount already allocated (see ‘B14 160738 Capital Works Program PSP Version’) – should be included in the capital expenditure for PSP2.

Is the project efficient?	Jacobs Assessment:	
<p>While sufficient evidence has been sighted to support the selection of the preferred Network upgrade option, limited evidence has been provided to support the selection of the preferred WWTP upgrade option (WWTP Option 2). Specifically, no evidence has been sighted that demonstrates that the risks associated with this option have been assessed as tolerable. However, Jacobs acknowledges that this option (Option 2) has a significantly lower capital cost than the alternative upgrade option considered (WWTP Option 3) and that it does not preclude the adoption of more substantive plant upgrades that may better address these risks (i.e. a new process train) in the future. As a result, it is Jacobs’ opinion that the project is efficient and could be reasonably expected to be undertaken by an operator exercising good industry practice.</p> <p>Options assessment and selection of preferred option: The options assessment discussed in the business case included consideration of multiple options for the individual networks upgrades and WWTP upgrades as well as a consolidated overall options assessment for the project, based on combinations of network and WWTP upgrades.</p>		

Network Upgrade Options
Option 1 – Do Nothing
Option 2 – East Emu Upgrade – Retain and upgrade Emu River Syphon
Option 3 – East Emu Upgrade – Replace Syphon with SPS and rising main to River Rd SPS
Option 4 – West Emu Upgrade (PREFERRED)
WWTP Upgrade Options
Option 1 – Negotiate a new EPN for Burnie WWTP (Not acceptable)
Option 2 – Upgrade / Optimisation of the WWTP (PREFERRED)
Option 3 – Structural Upgrade or Construction of a Third WWTP process train
Overall Project Options
Option 2 – East Emu Upgrade – Retain and upgrade Emu River Syphon AND Option 2 – Upgrade / Optimisation of the WWTP
Option 3 – East Emu Upgrade – Replace Syphon with SPS and rising main to River Rd SPS AND Option 2 – Upgrade / Optimisation of the WWTP
Option 4 – West Emu Upgrade AND Option 2 – Upgrade / Optimisation of the WWTP (PREFERRED)

Network Options Assessment

It is Jacobs' opinion that sufficient evidence has been provided to support the robustness of the options assessment and selection of the preferred network option. The preferred option was selected in GHD's report '21326_Burnie Sewerage Network__Modelling Options Analysis_Final Report - Lion Burnie'. This assessment included consideration of six options involving an MCA assessment that considered constructability, social and environmental factors, and costs impact for each option.

WWTP Options Assessment

In spite of limited evidence sighted by Jacobs, it is our opinion that the options assessment and the selection and of the preferred WWTP upgrade solution was sufficiently robust.

The development of WWTP upgrade options is supported by process modelling of the WWTP (see *Roundhill WWTP BioWin Modelling Report GHD Ref 3216613216993 December 2012 (Final)*). While Jacobs finds the project efficient, the following is noted that:

- Limited evidence was sighted in support of selection of the preferred option and included only some brief qualitative discussion presented in the business case.
- While the preferred option is the lowest cost solution, it appears to present some clear plant redundancy risks and limited ability to cope with any additional flows (e.g. through underperformance of the Storm Water Infrastructure Development Project). It is noted that TasWater do not expect significant increase in flows due to growth in the area for the next 20 years.
- Evidence supporting the selection of the preferred option (i.e. NPV, triple-bottom-line, MCA, etc.) has not been provided to Jacobs.
- Limited evidence has been sighted to support the robustness of this options assessment and the selection and of the preferred WWTP upgrade option. TasWater have stated that a robust options assessment was undertaken and that WWTP Upgrade Option 3 was thoroughly considered, and subsequently ruled out because it was deemed cost prohibitive. TasWater have also stated that the cost estimate for this project is \$11,528,000. While limited supporting evidence has been sighted, if TasWater's statements are accurate, Jacobs would a) agree Option 3 is cost prohibitive, b) support the TasWater's selection of the preferred Option 2 as the preferred option, and c) find the selection of the options assessment sufficiently robust.

Cost Estimates

Networks Options: It is Jacobs' opinion that sufficient evidence has been provided to demonstrate that the cost estimations for the networks options are robust. As part of GHD's assessment they conducted detailed bottom-up cost estimates for each option and an NPC analysis (see '*Lion Burnie Network Upgrades detailed cost estimates 070514*').

WWTP Options: As discussed above, limited evidence supporting the options assessment for the WWTP upgrades has been provided.

WWTP Option 2: The cost estimate for Option 2 (\$2,345,200) was included in the business case and is considered sufficiently robust.

WWTP Option 3: Evidence supporting the cost estimate for Option 3 has not been sighted but TasWater have stated that the cost estimate for Option 3 was \$11,528,000 and includes a 30% contingency. While the lack of evidence supporting this figure is noted, Jacobs considers it reasonable to assume that TasWater have adopted a similar approach for Option 3 to the approach adopted for Option 2. If this is the case then it is Jacobs' opinion that the cost estimate is sufficiently robust.

Overall Cost Estimates:

The business case and supporting documentation indicate that the estimate cost for the overall project (i.e. Network Option 4 and WWTP Option 2) is \$7.17M. The evidence provided in support of this figure is sufficiently robust and provides confidence that projected CAPEX is accurate.

It is noted that the estimated project cost of \$5.7M provided in TasWater's PSP submission (refer '*B14 160738 Capital Works Program PSP Version*') does not seem to align with the figure presented in the detailed cost estimates and business case. In '*B14 160738 Capital Works Program PSP Version*' the project is split over two separate line items – one for the network upgrade (\$3.7M) and one for the WWTP upgrades (\$2.1M). Based on the evidence provided the reason for this discrepancy is unclear. There are multiple instances where similar discrepancies (i.e. varying figures being used in different key documents) have been observed as part of this review. For further discussion on this issue please refer to Section 3.2.2.

While this discrepancy in costs listed in the business case/detailed cost estimates and TasWater's PSP submission is recognised, it is Jacobs opinion that no adjustment to the expenditure of TasWater's draft PSP2 submission is required for this project.

Allocation of CAPEX costs between TasWater and LD&D: It is Jacobs' opinion that sufficient evidence has been provided to demonstrate the basis on which LD&D capital contribution of \$2.369M was determined is reasonable (see '*Briefing Note - Lion Works External Contribution – Signed*' and '*Lion Burnie Network Upgrades detailed cost estimates 070514*').

Procurement Approach: TasWater have stated that both the network and WWTP upgrades would adopt standard procurement approaches by "getting design completed and then going to market for construction". No further evidence of the procurement approach has been sighted. However, if this statement is true and TasWater adopts a traditional procurement approach for each upgrade, Jacobs would consider this reasonable and efficient.

Recommendations

As discussed above, it is Jacobs' conclusion that this project is prudent and on balance efficient, noting the reservations above.

Assumptions

In assessing the prudence and efficiency Jacobs has assumed:

- The Storm Water Infrastructure Development Project will achieve the expected volume reduction to the sewerage network
- The project is will continue to meet the delivery timeline listed in Table 6 of the business case

Reference Documentation


Reference documentation used in the review of this CAPEX project:

- Doc 70.13 - CWC - Tag 10 - Burnie Lion Trade Waste - Network and WWTP Upgrades Business Case (Attachment 1) - June 2014
- 21326_Burnie Sewerage Network__Modelling Options Analysis_Final Report - Lion Burnie
- Briefing Note - Lion Works External Contribution – Signed
- Burnie - Round Hill Wastewater Treatment Plant EPN 72971 2007
- Burnie - Round Hill Wastewater Treatment Plant Permit 6279 2004
- Lion Burnie Network Upgrades detailed cost estimates 070514
- NPV and detailed cost estimates -Burnie Lion Business Case 2014 Rev 1
- Roundhill WWTP BioWin Modelling Report GHD Ref 3216613216993 December 2012 (Final)
- TW Response to Jacobs RFI-19 CAPEX - Project 13 Burnie Lion Trade Waste Upgrades
- Doc 43 Capital Projects Prioritisation Procedure v3
- TasWater Draft Price and Service Plan 2015-18 (August 2014)
- Ring Fencing Guideline

B.14 Bridport STP upgrade and re-use scheme

Project Name	Bridport STP Improvement Program				
Primary Driver	Growth	Secondary Driver(s)	Compliance	Business Efficiency	Replacement / Renewal
Organisation	TasWater (originally proposed by Ben Lomond Water)				
Service	Wastewater (and re-use)				
Project Type and Progress	Gate 2 business case board approval in May 2014				
Jacobs Review Number	Project 14				

TasWater CAPEX Budget (nominal)							
FY12/13	FY13/14	FY14/15	FY15/16	FY16/17	FY17/18	Beyond	Total
-	-	\$2.87M	\$3.1M	-	-	-	\$5.97M

Project Description		
<p>Bridport is a small coastal town on the north-east coast of Tasmania that attracts a large seasonal population. The town has an off-peak population of 1,715 and a peak population (in January and February) of over 4,000. The town is serviced by Bridport Sewage Treatment Plant (STP), which includes two treatment lagoons and a polishing lagoon. The majority of effluent from the STP discharges into Anderson Bay, adjacent to the primary swimming recreation beach. Some effluent (approximately 1.5%) is currently reused for irrigation at Bridport Golf Course.</p> <p>Bridport STP has a history of poor compliance with the discharge-to-water limits of its EPA operating permit (STP Environmental Protection Notice 6154), and has a range of other performance issues including odour emissions, health and environmental risks. It is understood that the current operating permit is over 5 years old and is due for review by the EPA (as required by Clause 26.1 of the <i>State Policy on Water Quality Management 1997</i>). An updated operating permit would almost certainly include stricter discharge limits, consistent with levels that can be achieved by modern accepted technology (SPoWQM Clause 17.1), exacerbating the compliance challenge of Bridport STP.</p> <p>In addition, the population of Bridport (permanent and seasonal) is projected to grow by 26% by 2035:</p> <ul style="list-style-type: none"> - Off-peak dry weather flows will increase from 420kL/d (current) to 530kL/d (2035) - Summer peak dry weather flows will increase from 918kL/d (current) to 1150kL/d (2035). <p>The current capacity of the Plant has not been specified within the documentation provided to Jacobs, but the project Business Case discusses that the capacity of the plant will need to be increased to accommodate 2035 flows.</p> <p>TasWater's proposed solution is the establishment of a self-sufficient reuse scheme. The scheme would see TasWater purchase a 367ha pine (<i>Pinus radiata</i>) plantation – located 10km from the STP – to which TasWater could transfer 100% of the STP effluent for irrigation purposes. Ownership of the plantation would remove any demand risk for the effluent and provide the potential for future economic benefits through the harvesting of the pine trees on the plantation. TasWater would also continue to supply a small percentage of irrigation water to the Bridport Golf Course (as currently). The reuse scheme would require the construction of a new pump station and rising main (from the STP to the plantation), and a storage dam on the plantation. Additionally, the project would include various upgrades and the replacement/renewal of some assets at the STP to ensure effluent is suitable for Class C reuse.</p> <p>TasWater indicate that the proposed works will remove all discharges to Anderson Bay (up to 1-in-10 year wet weather events), and will reduce odour issues and the health and environmental risks associated with the STP.</p>		
Is the project prudent?	Jacobs Assessment:	
<p>Jacobs finds that this project is prudent on a needs basis. It is aligned with TasWater's key drivers and obligations, and could be reasonably expected by an operator exercising good industry practice given the circumstances of TasWater at the time the decision was made. However, due to land acquisition delays it is expected that around \$4.92M will be spent in the PSP2 period, compared to the \$3.1M included in the Draft PSP. That is some of the expenditure contemplated in PSP1 will be deferred now to PSP2 period.</p>		

Project Need: TasWater and the EPA recognise that Bridport STP is consistently non-compliant with the discharge-to-water limits into Anderson Bay specified in its current EPA operating permit (EPN). This presents a clear regulatory need for TasWater to take action to resolve these non-compliances. Jacobs agrees that the 'do nothing' solution is not acceptable.

Cost driver allocation: Jacobs agrees that there are multiple cost drivers for this project aligned with the Ring Fencing Guideline – including compliance, growth, renewals and improvement (for the discretionary expenditure discussed below), but disagrees that the primary driver for this project is growth. It is Jacobs' opinion that the primary driver is compliance. If it was growth then staging of the new facility should have been more incisively considered and evaluated.

Project Timing: The inclusion of the project within the PSP2 expenditure program is consistent with TasWater's risk-based capital prioritisation process, noting TasWater's decision to continue with the delivery of compliance commitments made by its legacy regional organisations; and that it is TasWater's DP&EMPs that detail the proposed timing of non-compliance rectifications (rather than the EPA issuing event based EPNs with compliance deadlines). The project business case was initially developed by BLW and approved by the BLW Board in May 2013, where the EPA's 2009 and 2011 WWTP Priority Lists to Ben Lomond Water ranked Bridport 15th out of BLW's 28 WWTPs. TasWater's state-wide October 2014 WWMP risk assessment ranks Bridport 21st out of 110 systems (where all top 32 systems have high priority licence compliance issues and 17 of the top 20 projects have proposed capital expenditure for PSP1 or PSP2). The business case has subsequently been revised (and approved by the TasWater Board on 7 May 2014).

Planning Horizon: Insufficient evidence has been provided to Jacobs to confirm the robustness of the growth and demand estimates that have been used to size the infrastructure for the 2035 horizon. TasWater have indicated that the 1% p.a. growth projected in Bridport is based on 10-year historical data, but have no further evidence supporting the assumption that future growth will match historical growth (e.g. compared to the state-wide average of 0.5% p.a. provided within the Draft PSP2). Similarly, the information provided does not confirm the sizing of the plant, pipeline, pumping station and dam on which the cost estimates are based. TasWater and consultant capacity assessment and upgrade options reports have been mentioned but not made available for assessment.

Deliverability: TasWater have advised that the delivery program proposed in the Business Case is not achievable. Delays of around 1 year have occurred as a result of the land acquisition process for the pine plantation, which has been very recently concluded (November 2014). The DP&EMP is also currently with the EPA for assessment and approval (no expected timeframe for approval has been provided) and no design work has yet commenced (other than the dam). Considering the project activity durations in the business case, it is Jacobs' opinion that the only material cost likely to be incurred in the current financial year will be the land purchase (\$1.05M in the business case). The other \$1.82M expected to be spent this financial year (including construction of the dam and upgrades at the STP), would likely not be incurred until the PSP2 regulatory period. As such, it is expected that around \$4.92M will be spent in the PSP2 period, compared to the \$3.1M included in the Draft PSP (assuming no adjustment in discretionary expenditure – see below). Jacobs believes that it would be reasonable to expect that the project will be delivered within the PSP2 regulatory period.

Is the project efficient?	Jacobs Assessment:	
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It is Jacobs' opinion that the selection of a re-use solution for Bridport is consistent with an operator exercising good industry practice, but that not all expenditure is mandatory and hence not efficient to deliver the desired outcomes. Insufficient evidence has been provided to Jacobs to demonstrate the robustness of the NPV analysis and options assessment – although at a high level they appear reasonable.

Options Assessment and selection of the preferred option (which includes non-regulated activities): The options assessment discussed within the business case considered a number of re-use options, a mechanical upgrade of the STP, the construction of a deep ocean outfall, and a 'do nothing' scenario. Based on the high-level numbers provided in the business case, Jacobs notes that the re-use options have significantly lower NPCs (least-negative NPVs) than the outfall and mechanical upgrade options. Jacobs agrees that the selection of a re-use solution is consistent with the EPA's Tasmanian Water Quality Policy (which requires an assessment of the viability of all possible re-use options before the EPA will approve an STP upgrade) and notes that a re-use solution effectively mitigates TasWater's compliance risk to potentially stricter discharge-to-water limits in an updated EPN for the STP.

However, insufficient evidence has been provided to Jacobs to support the robustness of this options assessment and the selection and sizing of the preferred solution. Some key observations are discussed below (note that this discussion excludes the unacceptable 'do nothing' option).

- While there is some qualitative discussion (i.e. bullet points) of the options assessment, no evidence has been provided that a structured multi-criteria analysis has been performed to systematically evaluate cost and non-cost factors and quantitatively support the selection of the preferred option (Option 2).
- Jacobs notes that the preferred option has the best NPV, but that it is only 1.5% better than Option 4 and 4% better than Option 3. The capital expenditure of the preferred option is approximately \$1.5M higher than Options 3 and 4 (mainly due to a larger land acquisition and construction of a longer pipeline), but has the best NPV due to the anticipated \$8.69M revenue stream from the thinning and harvesting of the pine trees in 2020 and 2036. A note in the NPV output analysis states that if

revenue is only 50% of the current estimate the NPV would be negative \$8.353M, dropping its rank to 4th. No further evidence of sensitivity testing has been provided and the qualitative options assessment discussion in the business case does not highlight any non-cost factors that materially justify the selection of preferred option over Options 3 and 4. Jacobs understands from TasWater that Options 3, 4 and 7 have now become unavailable due to private land sales, constraining the options forward.

- The need for a secure demand for the re-use water has been provided by TasWater as justification for the land acquisition of pine/eucalyptus plantations in the preferred option and Options 3 and 4. The business case indicates that TasWater have investigated third-party re-use options – where the only possible scheme was Option 7, which would not provide long-term demand security. However, the 2011 BLW WWMP briefly mentions a 'dune infiltration' option. TasWater indicates that significant investigations and trials would have been required to prove the concept, but this has not been discussed/explored in the options assessment supporting the business case.
- The business case and discussions with TasWater indicate that it has an understanding of the works to be performed to deliver the reuse scheme. TasWater indicate that all new infrastructure has been sized based on 2035 summer peak flows, but evidence of this has not been provided.
- No details have been provided to allow the reasonableness of cost estimates to be tested. Jacobs have been advised that they are based on experience from the Beaconsfield reuse scheme recently implemented by TasWater, with further input from GHD. The potential revenue from the sale of the pine timber was calculated based on rates from a pulp wood producer. It is understood that risk adjusted cost estimates have not been developed (risk costs have been captured in the 30% contingency applied as standard for Gate 2 business cases). It is noted that the contingency and engineering allowances have appropriately not been applied to the land cost.
- It is noted that OPEX savings have been estimated as part of the NPV analysis process (although it is understood that generally project-specific OPEX savings have not been incorporated into the draft PSP2 submission).

Discretionary Expenditure: It is Jacobs' opinion that not all of the project scope is mandatory expenditure needed to address current and future EPN non-compliances. One component of the project scope is a 'minor upgrade' to the STP to allow Class B recycled water to be consistently produced for delivery to the Bridport Golf Club. A prudent driver for this expenditure has not been provided and this scope appears separable to the rest of the pine plantation reuse scheme. The golf club receives around 1.5% of plant flows and the pine plantation is able to accept 100% of plant flows as Class C water (with the potential to become Class B after storage in the reuse dam). It is understood that TasWater do not have an obligation to deliver water to the golf club and the golf club is not dependent on the availability of the recycled water (using town water to water greens and trees). At the same time it is appreciated that the new re-use pipeline will require an easement through the golf course.

This upgrade was included in all options assessed but has not been separated out of the \$350,000 line item (business case Table 9), which also includes the installation of screens (which is required for the main project scope). Jacobs has been unable to source an itemised cost estimate from TasWater and so has estimated the screen installation at \$320,000 (excluding contingency) by using the average screen installation cost from TasWater's STP Inlet Works Program (reviewed in Appendix B.11). Therefore Jacobs estimates the cost for the minor upgrades to be \$30,000 and recommends that \$43,000 be 'backed out' from the project budget (\$30,000 plus 30% contingency and a 12.5% engineering allowance).

Procurement Approach: The business case indicates that the capital works will be divided into several packages of work for competitive tender, including: design of the dam and pipeline; design of the irrigation system and pump station; dam construction; pipeline & STP construction; irrigation system construction; and the STP upgrades (presumably D&C). This division of works packages appears reasonable. No further details have been provided by TasWater at this stage of the project development.

Unregulated Activity: As discussed in Section 3.5.4, Jacobs interprets the ownership and management of the pine plantation and associated re-use scheme as a regulated activity under the *Water and Sewerage Industry Act 2008* and as defined in CI 2.2.2 of the *Price and Service Plan Guideline (Nov 2013)* and CI 4.4.6 of the *Water And Sewerage Accounting Ring Fencing Guideline May 2013*. As such, the proposed capital expenditure should be included into TasWater's RAB and revenue to be generated through the harvesting of pine trees should also be incorporated in the Regulator's pricing determination.

However, Jacobs would expect that unregulated expenditure should include a proportion of the upgrades to the STP related to the production of Class B recycled water for the golf course. This is to be calculated as per CI 4.4.6 of the Ring Fencing Guideline, but insufficient data has been provided by TasWater to allow Jacobs to perform this calculation.

For future pricing determination submissions it would be expected that TasWater should provide for similar projects:

- Details of capital cost allocations for this project (as per the Ring Fencing Guideline)
- Evidence to clarify and support TasWater's position on the apportionment of the project expenditure to regulated and unregulated services.

- Evidence to demonstrate that any project assets/expenditure allocated to unregulated services can demonstrate full cost recovery (revenue from the golf club and, separately, revenue generated through the harvesting of pine trees), thereby ensuring there is no cross-subsidisation from regulated customers.
- Evidence to demonstrate that TasWater is not securing an unfair competitive advantage over other commercial pine plantations.

Recommendations

As discussed above, it is Jacobs' recommendation that:

- The discretionary and unregulated expenditure (being the upgrade of the STP to allow Class B recycled water to be produced) be removed from TasWater's capital expenditure submission for PSP2. This has currently been estimated at \$43,000 (being \$30,000 plus 30% contingency and 12.5% engineering allowance).
- TasWater's expenditure profile for the project be adjusted to reflect likely spend over the 14/15 – 15/16 financial years (assuming the activity durations in the Table 8 Work Plan of the business case remain unchanged). This results in an increase in the project expenditure for the PSP2 regulatory period, as summarised in the table below:

	FY14/15	FY15/16	FY16/17	FY17/18	Total
TasWater expenditure	\$2.87M	\$3.1M	-	-	\$5.97M
Jacobs Proposed adjustment	-\$1.82M	+1.78M	-	-	-\$0.04M
Jacobs Proposed expenditure	\$1.05M	\$4.88M	-	-	\$5.93M

Assumptions

TasWater's expenditure profile in the table above has been adjusted with the assumption that the activity durations in the Table 8 Work Plan of the business case remain unchanged.

Where detailed evidence has not been provided, information within the business case has been assumed to be valid (i.e. given the benefit of the doubt) when it has been separately and indirectly tested through discussions and RFIs with TasWater personnel (e.g. that the land acquisition was concluded in November 2014).

Reference Documentation


Reference documentation used in the review of this CAPEX project:

- Bridport STP Improvement Program Business Case (Version 02, April 2014)
- EPA letter to TasWater re Bridport WWTP potential effluent reuse scheme (February 2014)
- TasWater Draft Price and Service Plan 2015-18 (August 2014)
- TasWater state-wide Wastewater Management Plan risk assessment spreadsheet (October 2014)
- TasWater state-wide Capital Works Program PSP spreadsheet (B14 160738, October 2014)
- Ben Lomond Water 2011 Wastewater Management Plan
- EPA letter to Ben Lomond Water – 2009 Wastewater Treatment Plant Compliance Priority List (21 December 2009)
- Tasmanian Water and Sewerage Industry Price and Service Plan Guideline (November 2013)
- Tasmanian Water And Sewerage Accounting Ring Fencing Guideline (May 2013)
- Tasmanian Water and Sewerage Industry Act 2008
- EPA State Policy on Water Quality Management 1997
- TasWater response to Jacobs RFI-18 CAPEX - Project 14 Bridport STP

B.15 Ben Lomond Water's Water meter installation project

Project Name	Water Metering Project
Primary Driver	Efficiency
Organisation	Ben Lomond Water
Service	Water
Project Type	Historical
Jacobs Review Number	Project 15

CAPEX Actual (nominal)			
FY10/11	FY11/12	FY11/12	Total
\$0.761M	\$8.418M	\$2.626	\$11.806M

Project Description		
<p>Ben Lomond Water's installed automated meter reading technology on all property connections over a three year period - including previously unmetered connections and the replacement of existing meters. [REDACTED]</p> <p>[REDACTED]</p> <p>The Ben Lomond Water Meter Project was established to install "new" and "replacement" meters for these water connections. Southern Water initiated the meter replacement program and then included options in the contract for the scope to be extended to Ben Lomond Water and Cradle Mountain Water. Ben Lomond Water wanted to manage its own program and so novated the contract from Southern Water. Jacobs understands from discussions with TasWater that Ben Lomond Water relied on the preliminary investigations completed by Southern Water. A subsequent analysis was completed by Marchment Hill Consulting (MHC) calculating the economic benefits for all three former water service providers.. The Ben Lomond Water meter replacement contract was novated from the Southern Water installation contract with Skilltech, subject to Separable Portion 5 of the contract, on 7 July 2011.</p> <p>During 2010 the Australian Government announced a \$10 million grant to the Tasmanian Water and Sewerage Corporations - Southern Water, Ben Lomond Water and Cradle Mountain Water - to install automated meter reading technology across the state in order to support introduction of two part pricing and a reduction of water usage. In its analysis, Ben Lomond Water assumed an Australian Government Grant funding of \$2.5 million.</p> <p>Jacobs understands that practical completion was achieved on 27 July 2012. The scope of works according to the Water Meter Installation Contract - Separable Portion 5 issued on 11 June 2011 included 52,000 meter replacements and 1,400 new meter installations. The final number of meters installed has not been provided to Jacobs or the overall performance of the program from a cost and delivery viewpoint.</p>		
Is the project prudent?	Jacobs Assessment	
<p>Jacobs find the installation new meters to support the introduction of two part pricing to be prudent– particularly the installation of new meters.</p> <p>The key driver for this project as stated in the <i>Board Circulating Resolution Report</i> is the "mandatory universal metering by 30 June 2012, required by the Tasmanian Government to support the introduction of two part pricing".</p> <p>According to <i>A Report for the Department of Treasury and Finance, Meter Rollout Options for Moving to Two-Part Pricing in Tasmania</i> (Marchment Hill Consulting (MHC), 2009) "the Water and Sewerage Industry Act 2008 contains a series of pricing principles to which the new corporations must adhere no later than from the commencement of the first regulatory period for the sector on 1 July 2012. In particular, the Act provides for efficient pricing through: "...two-part pricing for water services based on the recovery of fixed costs and variable costs by way of separate charges through deemed consumption profile, voluntary metering, mandatory metering or in such other manner as determined by the Regulator. By 1st July 2021 the variable component of the two-part water price will be based, for each</p>		

consumer, on actual (metered) use”.

The Water and Sewerage Industry Act (Tas) 2008 makes no explicit reference to the obligation to install meters, but refers only to the fact that the entity may install a meter. Section 56 discusses a range of issues about meters and their reading, access, etc., but at no point requires that they be installed or the timeframe in which they are to be installed. While there does not appear to be any direct statutory requirement in the Act to install water meters as such, both the act and the regulations regarding pricing do require “a variable charge for water service”.

A reasonable interpretation of these documents is that a two part pricing of water is intended and that this will eventually be based on water meters to determine the volume of water. There is no clear mandatory requirement for meters as such in the legislation, nor, by implication a deadline for their installation. In addition, there is no requirement for any particular type of meters, e.g. automated meters as opposed to manually read meters.

As noted above, prior to the commencement of this project there were a number of unmetered connections. Jacobs finds that the installation of new meters to be necessary, and therefore prudent, for Ben Lomond Water to support the introduction of two part pricing for these connections. [REDACTED]

[REDACTED] The NPV calculations are further discussed in the subsequent section.

[REDACTED]

[REDACTED] Jacobs understands that Ben Lomond Water (and TasWater) adopts an asset life of 15 years for a meter. This is consistent with the asset life employed by other water utilities.

Jacobs has questioned the need to immediately replace working meters that still had a significant remaining asset life (e.g. greater than 10 years). Based on a response to an RFI, TasWater stated that “all meters including meters less than 15 years old were replaced. This was due to a number of factors as only certain meters could be retrofitted, not all meters met current standards, and the cost of retrofit was comparable to replacement.”

In addition, the Water Meter Rollout Report (MHC, November 2009) considers the base case (a situation close to the status quo with no new meters rolled out to unmetered properties and meters will be replaced as necessary) against voluntary metering (a situation where customers without a working water meter may elect to have one installed) and mandatory metering (where all customers without a working water meter are required to have one installed. The rollout of meters to all customers is assumed to take place over one year). The report concludes that “a mandatory [automated meter reading] (AMR) meter rollout clearly emerges as the metering option with the strongest value. A voluntary (AMR) rollout option follows with a lesser, but still positive, NPV. Options using manually-read meters are weakest. The Base Case (AMR), where no new meters are rolled out, but existing meters are replaced with AMR meters at the end of their lifetime, shows a slightly stronger NPV than the Mandatory (AMR) meter rollout, owing primarily to the latter’s once-off, upfront cost of installing meters on previously unmetered properties.” Unfortunately no analysis appears to have been undertaken regarding the potential opportunity of installing AMR meters on all unmetered properties and replacing existing meters with AMR meters at the end of their lifetime.

Based on the information available to Ben Lomond Water, we conclude that undertaking the program of meter replacements was prudent.

Is the project efficient?	Jacobs Assessment	
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Based on the evidence cited, Jacobs find that this expenditure is efficient. The expenditure represented the best and most cost effective way of meeting the community’s need for the relevant services.

[REDACTED] Jacobs has been provided *Smart Metering Benefits and Costs Investigation – Southern Water - Final* (MHC, undated) and the *Smart Metering Economic Benefits and Costs Investigation* (MHC, Version 1.2 22 November 2010) which contains detailed analysis for Ben Lomond Water.

The metering rollout options as outlined in the MHC report (Version 1.2 22 November 2010) were as follows:

- Do nothing.
- Installation of manual meter reading (MMR) (technology on new connections and meters identified for replacement). This option is based on simple accumulation meters, which are manually read at 3 monthly intervals. This is similar to the metering arrangements currently adopted in Tasmania, but involves more extensive meter coverage.
- Installation of automated meter reading (AMR) technology on all connections. This option is based on an accumulation meter with communications capability, which are automatically read by walk-by or drive-by data collection at on a weekly basis by drive-by data collection (e.g. via meter reader in a vehicle or on a motor bike or cycle, garbage truck, postman, etc.)

short listing and financial evaluation process. Evidence of this tender process has been provided. The tender evaluation included consideration of financial and non-financial criteria. As such we conclude that the costs are efficient and in line with market conditions.

Recommendations

In summary, Jacobs finds that the decision to install new meters and replace meters with automated meter reading technology to be justified. However, Jacobs has not seen sufficient supporting documentation to justify the timing of the replacement of all meters, in particular relatively new, working meters. Jacobs has insufficient information to be able to propose a reduction in costs to account for the meters that were not prudent to replace.

Jacobs has reviewed supporting information on the competitive tendering of the project and concluded that the costs are efficient and in line with market conditions. TasWater has appropriately commissioned a detailed review of the meter replacement strategy. Jacobs understands that the subsequent phase of this study, Stage 2, will focus on TasWater's future meter replacement strategy, for TasWater's 45,000 meters that are still manual read and include a detailed NPV analysis in order to direct future metering strategies. We recommend that future business cases consider the outcomes of this report.

Assumptions

Jacobs has made the following assumptions in our review:

- Actual cost of \$11,806,243
- Actual number of meters installed is 53,400 meters based on Separable Portion 5

Reference Documentation

Jacobs has relied on the following documentation in our review:

- Response to RFI – BLW Metering Project (TasWater, undated)
- Board Circulating Resolution Report (Ben Lomond Water, 10 December 2010)
- EOI Document (Ben Lomond Water, Cradle Mountain Water, Southern Water, 16 August 2010)
- Letter - Acceptance of Ben Lomond Water Skilltech Contract Novation for Separable Portion (July 2011)
- Letter - Skilltech Contract Novation for Ben Lomond Water Separable Portion - to Skilltech (July 2011)
- Letter from Ben Lomond Water - Water Meter Installation Contract - Separable Portion 5 (June 2011)
- Smart Metering Benefits and Costs Investigation – Southern Water - Final (MHC, undated)
- Smart Metering Economic Benefits and Costs Investigation, Version 1.2 (MHC, November 2010)
- Stage 1 Combined Report Meter Condition & Benefit Realisation (GHD, October 2014)
- Combined Board meeting report - WMT Business Case (Southern Water, December 2010)
- Water Metering - Evaluation - Consolidated Evaluations of EOI RFI Responses (excel spreadsheet, undated)
- Report for Metering Technology Provider Evaluations (GHD, November 2010)
- Meter Rollout Options for Moving to Two-Part Pricing in Tasmania (MHC, November 2009)
- RFI evaluation presentation (ICG, October 2010)

B.16 Westbury WTP, reservoir and pipeline construction

Project Name	Westbury WTP
Primary Driver	Compliance
Organisation	Ben Lomond Water
Service	Water
Project Type	Historical
Jacobs Review Number	Project 16

CAPEX Budget (nominal)							
Previous	FY09/10	FY10/11	FY11/12	FY12/13	FY13/14	FY14/15	Total
-	-	\$0.06M	\$1.17M	\$3.42M	\$2.42M	-	\$7.07M

Project Description

The Westbury/Hagley system comprises approximately 965 connections. Water is pumped from the Meander River Weir intake into the Westbury raw water dam located off Birralee Road near Westbury. Water is chlorinated and fluoridated at this dam site and reticulated to the townships of Westbury and Hagley.

The Exton system comprises approximately 82 connections. Water is pumped from the Meander River to the Exton Service Reservoir, and is gravity fed to the township. Water is chlorinated at the pump station site.

The Department of Health and Human Services (DHHS) has identified both the Westbury/Hagley system and the Exton water system as a high risk of bacteriological contamination and has, therefore, included both on its Priority Project List.

This project involves the design and construction of a 3.7ML/d water treatment plant (WTP), 5.5 ML reservoir and associated infrastructure for the township of Westbury/Hagley. In addition, this project includes the construction of a 7.2km delivery pipe from the new Westbury WTP to Exton. The aim of the project was to allow all towns to comply with the Tasmanian Drinking Water Guidelines (TDWG).

The WTP commenced delivering treated water to customers in January 2014.

Is the project prudent?

Jacobs Assessment:



Jacobs finds that this project is prudent on a needs basis. It is aligned with TasWater's key drivers and obligations, and could be reasonably expected to be undertaken by an operator exercising good industry practice given the circumstances at the time the decision was made.

Project need: It is recognised that treated water in full compliance with the TDWQG health limits was not being provided to the towns of Westbury and Exton. Both towns are included on the DHHS Priority List for 2010. This represents a clear regulatory need to take action to resolve these non-compliances. Jacobs agrees that the 'do nothing' solution is not acceptable.

Cost driver allocation: The primary driver for the project was compliance – meeting regulatory obligations for the quality of drinking water. Westbury/Hagley system as a high risk of bacteriological contamination and included it on its Priority Project List. [REDACTED]

Project timing: The inclusion of the project within the PSP expenditure program is consistent with TasWater's risk-based capital prioritisation process, noting TasWater's decision to continue with the delivery of compliance commitments made by its legacy regional organisations; and that it is TasWater's DP&EMPs that detail the proposed timing of non-compliance rectifications (rather than the EPA issuing event based EPNs with compliance deadlines). The project business case for the WTP was developed and approved by the BLW Board in March 2011 and the trunk main to Exton business case was developed and approved in November 2011. Both towns were included on the 2010 DHHS Priority Project List. It is noted that the Westbury Supply System was also included within the 2014 DHHS Priority List for Drinking Water Supply Systems issued on 18 February 2014 (following the WTP commencing supply in January 2014). However, we understand that this simply relates to timing of the assessment.

Planning horizon: The assumptions used for the development of the growth and demand estimates that were used to size the

infrastructure appear to be reasonable, at the time of development. It is noted that a 1% p.a. growth rate was adopted for the 30 year period (e.g. as compared to the state-wide average of 0.5% p.a. provided within the Draft PSP2).

Deliverability: According to the Business Case, the WTP and reservoir project was originally scheduled for completion in June 2012. The Exton pipeline project was integrated with the Westbury WTP project in November 2011 and proposed detailed design of the pipeline in 2011/12 and construction in 2012/13. Jacobs considers that the timeframe of completion of the project as set out in the Business Case was not practicable. In response to Jacobs' RFI, TasWater states: *"The expenditure profile within the 2012 – 2015 PSP (developed June 2012) shows that the WTP was not anticipated to be completed until early 2013/14."*

TasWater further states: *"The planning for the reservoir construction was delayed by about 8 weeks between March and July 2011 due to a ban by Aboriginal Heritage Officers on undertaking site assessments due to a dispute with the State Government. Consequently the Planning Permit for the reservoir was not issued until 5 August 2011 and tenders for construction were advertised on 15 October. The Building Permit was issued on 22 November 2011. While the reservoir was substantially completed by December 2012 Practical Completion under the contract was not achieved until May 2013 due to difficulties experienced by the contractor in satisfactorily completing the water test for the infrastructure. This however did not delay the commissioning of the water treatment plant – the reservoir could not be utilised until the WTP was completed and it achieved practical completion before being required for operational use."*

In response to Jacobs' RFI, TasWater stated: *"Significant delays were experienced during the design and construction of the WTP and the Contractor fell well behind schedule despite the best efforts for the Superintendents representative. Some of the delay issues are subject to dispute under the contract."*

Jacobs notes that the WTP commenced delivering treated water to customers in January 2014 and that the reservoir contract and the Exton pipeline contract both achieved practical completion in May 2013.

Is the project efficient?	Jacobs Assessment:	
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Based on the evidence provided, Jacobs find that the expenditure currently proposed to be efficient and consistent with an operator exercising good industry practice.

Options assessment and selection of the preferred option: The options assessment discussed within the business case included: supply from Casino Reservoir to Westbury/Hagley, a new WTP Westbury (including capacity for Exton), and supply from Deloraine WTP to Westbury (including capacity for Exton). Based on the high-level numbers provided in the business case, Jacobs notes that the new WTP had the lowest NPC. In Westbury-Hagley Water Supply Study, undertaken in 2008, provides more details on the options analysis however it is understood that no structured multi-criteria analysis was performed to systematically evaluate cost and non-cost factors and support the selection of the preferred option.

The cost estimates in the Business Case were based on those developed in the 2008 Water Supply Study. The cost estimates in the Water Supply Study were based on unit rates for supply and installation, costs from recent similar works and GHD's cost database. The cost estimate was developed to an accuracy of ± 30% and included a 10% allowance for administration costs. No indication on the contingency allowance was noted in the report. Jacobs considers that the methodology used for the development of the budget cost estimate to be appropriate and understands that all works have been tendered and therefore market tested.

Procurement approach: The Business Case indicates that the works were to be delivered through a number of separate contracts: contracts under AS4122 for the detailed design and construction specifications for the Reservoir, Pump Station and the WTP (including D&C tender documentation); two construction contracts under AS2124 for the reservoir and the pump station; and a D&C contract under AS4300 for the WTP.

It is understood that prior to inviting tenders for the WTP, on 19 November 2012, significant investigations were undertaken to inform and confirm the process requirements for the WTP, and consultant reports were received on: jar testing investigations, fluoride dosing options, wastewater handling options, water stabilisation and pH correction, treatment options and design development.

The Westbury WTP contract, the Westbury Reservoir contract and the Westbury to Exton Treated Water Pipeline contract have all been competitively tendered and awarded. The lowest tendered was awarded the contract in all cases.

_____ while the Ben Lomond Water 2012-2015 PSP (prepared June 2012) nominates a project cost of \$6.7 million. In response to Jacobs' RFI, TasWater states: _____
 _____ Tenders were received for this project and a contract was entered into for the WTP on 12 April 2012. The WTP tender report detailed a revised project budget of \$6.659M, which is reflected in the PSP. At the time of preparation of the PSP a contract had been entered into for the reservoir construction and for the water treatment plant. _____

Recommendations

Jacobs finds that this project is prudent on a needs basis. It is aligned with TasWater's key drivers and obligations, and could be reasonably expected to be undertaken by an operator exercising good industry practice given the circumstances at the time the decision was made.

Based on the evidence provided, Jacobs find that the expenditure currently proposed to be efficient and consistent with an operator exercising good industry practice.

Assumptions

None

Reference Documentation


Jacobs has relied on the following documentation in its review:

- Board Meeting Report - Westbury / Hagley Water Treatment Plant Business Case, Ben Lomond Water, 4 March 2011
- Board Meeting Report - Trunk Water Main - Westbury To Exton - Business Case, Ben Lomond Water, 4 November 2011
- Westbury Reservoir Contract select documents, Various
- Westbury WTP Contract select documents, Various
- Westbury to Exton Pipeline Contract select documents, Various
- DHHS Priority List – Drinking Water Supply Systems – 2014, DHHS, 18 February 2014
- Westbury-Hagley Water Supply Study – Options Review, GHD, June 2008
- Westbury WTP Detailed Tender Assessment Report, Ben Lomond Water, 12 April 2012
- WTP Design Development Study (Westbury-Hagley-Exton)
- Board Meeting Report - Westbury Water Treatment Plant – Tenders for Treated Water Storage Reservoir, Ben Lomond Water, 2 December 2011
- Board Meeting Report - Tenders for Westbury Water Treatment Plant, Ben Lomond Water, 2 March 2012
- Westbury to Exton Treated Water Pipeline, Contract 2012/20 - Tender Assessment, Ben Lomond Water, 30 October 2012
- TW response to Jacobs RFI-11 CAPEX - Project 16 Westbury Hagley WTP, TasWater

B.17 Wynyard WWTP upgrades and renewals

Project Name	Wynyard WWTP
Primary Driver	Compliance
Organisation	Cradle Mountain Water
Service	Wastewater
Project Type	Historical
Jacobs Review Number	Project 17

CAPEX Budget (nominal)							
FY12/13	FY13/14	FY14/15	FY15/16	FY16/17	FY17/18	Beyond	Total
			\$3.5M	\$8.0M	\$10.0M		\$21.5M

Project Description		
<p>The project involves a number of plant and process upgrades and the reconfiguration and upgrade of the main switchboard and PLC at the Wynyard WWTP.</p> <p>The PSP states that major upgrade at the Wynyard WWTP is required to achieve compliance with accepted modern technology limits and rationalisation with Somerset STP.</p>		
Is the project prudent?	Jacobs Assessment:	
<p>Jacobs finds that this project is prudent overall on a needs basis. It is aligned with TasWater’s key drivers and obligations. However as the scope is currently being reassessed, no assessment of the timing, planning horizon, or deliverability can be made.</p> <p>Project need: The Site Strategy Report states that the Wynyard WWTP is non-compliant for suspended solids, with EPN 8833/1 being issued in 2013. EPN 8833/1 has been sighted by Jacobs. The EPN represents a clear regulatory need for TasWater to take action to resolve these non-compliances. Jacobs agrees that the ‘do nothing’ solution is not acceptable.</p> <p>Cost driver allocation: Jacobs agrees that there are multiple cost drivers for this project aligned with the Ring Fencing Guideline – including compliance, growth and improvement. It is Jacobs’ opinion that the primary driver is compliance.</p> <p>Project timing: The Site Strategy Report indicates that the works were to be undertaken over the 2013/14 to 2016/17 financial years. In response to an RFI TasWater states:</p> <p><i>“A revision of the strategy was required to incorporate the sewer network and sewage treatment plant. An update schedule is being developed as a part of the current business case. The previous strategy was not fully developed with, gaps in the system understanding currently being investigated. With consideration that the schedule is being further developed as results of investigations are being received, the intended completion time for the network and treatment plant is early 2017 allowing for approvals, design, tender and construction.</i></p> <p><i>Please note key safety issues identified are being currently being addressed.”</i></p> <p>The RFI response further states:</p> <p><i>“The current business case development is including the investigation of areas that were previously identified but lacked sufficient information to determine. The ambient monitoring is scheduled to take place throughout 2015. For the purpose of the strategy development the STP design is under the assumption that it will be required to meet acceptable modern treatment (AMT) standards until the ambient monitoring results are determined. It is expected that the ambient monitoring results will become available during the plant design allowing for minor changes to be incorporated.”</i></p> <p>Planning horizon: The assumptions used for the development of the growth and demand estimates used to size the infrastructure are reasonable. TasWater currently services 2,890 ET in Wynyard. The Site Strategy Report states that <i>“the Wynyard catchment is subject to</i></p>		

potentially rapid in-fill development and growth as evidenced by the extent of development already approved and/or planned” and “Infill residential development of 174 E.T. has been approved by Council with an additional 182 E.T. of in sequence residential development planned.” The Wynyard Review and Safety Audit (SMEC, 2014) further discussed the current and future flows in the catchment and loads of the plant to 2040 and 2060.

It is noted that in response to the RFI TasWater states:

“The current business case is looking at the sewer network, STP requirements and outfall requirements. The sewer network requires further information to be gathered on the system (hydraulic model, I&I investigation, condition assessment) to determine whether a new line from Fonterra is needed or whether the current system is suitable for the hydraulic flows (ADWF & PWWF). The STP has had studies completed with similar recommendations. As part of the current business case a new facility is being recommended to ensure compliance with future EPA requirements and limited ability to renovate the existing system due to system user constraints.”

TasWater further states that *“The draft business case currently being developed will include growth and demand estimates.”*

Deliverability: The delivery program proposed in the Site Strategy Report appears to be reasonable. Given that the Business Case is currently being developed, an updated delivery program will need to be developed as part of this process. As this is not yet finalised or been reviewed by Jacobs, an assessment of the deliverability of the program cannot be made.

Is the project efficient?	Jacobs Assessment:	
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As the project is prudent, it is appropriate that costs are allowed to undertake capital works to resolve the current non-compliance with Wynyard WWTP’s treatment licence. However, given that TasWater is currently reviewing the scope of works for the project and developing a new business case, it is likely that the costs for the proposed solution will be different to those currently within the PSP2. Jacobs is currently unable to determine whether the current costs within PSP2 are representative of final scope of works. As such, Jacobs is not able find that the costs are efficient but does not recommend any reduction in value in costs at this time.

Options assessment and selection of the preferred option: The *Wynyard Review and Safety Audit* discusses four potential strategies for the Somerset and Wynyard catchments (continued separate management of wastewater at Wynyard and Somerset, separate treatment of wastewater and single outfall, separate treatment of wastewater, single outfall and piped sludge transfer and combined management of wastewater at Wynyard and Somerset) as well as three treatment options (intermittently decanted extended aeration (IDEA), modification of the existing carrousel and three stage Bardenpho). From these three flow cases were selected for assessment with the three treatment options, being:

- Flow Case No. 1 - treatment in a single plant of Year 2040 domestic and trade waste flows from Wynyard;
- Flow Case No. 2 - treatment in a single plant of Year 2040 domestic and trade waste flows from Wynyard and Somerset; and
- Flow Case No. 3 - treatment in separate plants of Year 2040 domestic and trade waste flows from Wynyard.

For each of the options, i.e. Wynyard flows with IDEA treatment, Wynyard flows with modified existing carrousel, etc., the capital costs, operating costs and NPV were determined. For each flow case, modifying the existing carrousel was the preferred option in relation to price. For the treatment options, a MCA was undertaken using the following criteria: reliability and robustness of the process, and redundancy / flexibility (25%); operability (15%); ability to be staged (10%), and estimated costs (50%). The modification of the existing carrousel was the preferred option from the MCA.

In response to the RFI TasWater state: *“The SMEC report provided a selection criteria for the least cost option. Concern on the option selected has arisen through further investigation based on the constructability of the option in the available plant down time.”* The RFI response further states alternative options are *“currently being considered as part of the current strategy/business case.”*

TasWater further states *“A detailed assessment of the various upgrade options will be necessary as part of the business case currently being prepared to finalise a preferred solution.”*

Jacobs considers the options assessment and the selection of the preferred solution initially undertaken to be robust. However, as TasWater has expressed concern regarding the constructability of the preferred option and is currently undertaking additional assessment, from which a new preferred solution is likely to be adopted (although not yet specified), the efficiency of the current option has not been demonstrated.

It is anticipated the new cost estimates will be developed as part of the process of developing the Business Case. As these have not been finalised, Jacobs cannot make an assessment of the efficiency of the works.

Procurement Approach: The Strategy Report did not discuss the approach to procurement or the proposed delivery method. In response to the Draft Report, TasWater states *“The preferred solution once determined by an approved business case will be competitively tendered.”* Jacobs considers this approach to be reasonable and would expect that more details would be provided in the Business Case.

Recommendations

As discussed above, it is Jacobs' opinion is that this project is prudent on a needs basis. As the project is prudent, it is appropriate that costs are allowed to undertake capital works to resolve the current non-compliance with Wynyard WWTP's treatment licence. Jacobs has been unable to find that the project costs are efficient of the project as the scope of works has still to be determined and could vary significantly to the previous solution proposed. Jacobs does not recommend any reduction in value in costs, given this is the best available information available at this time and noting TasWater's 'oversubscription' approach to the development of its Capital Works Program for PSP2.

Assumptions

None

Reference Documentation


Jacobs has relied on the following documentation in its review:

- Wynyard WWTP Plant and Network Strategy Report (2013-2015), undated
- Environmental Protection Notice No. 9090/1 - Wynyard WWTP (Draft), EPA Tasmania, 11 August 2014
- Response to Jacobs RFI-22 CAPEX - Project 17 Wynyard STP – final, TasWater, undated
- Wynyard Review and Safety Audit, SMEC, 8 August 2014
- Environment Protection Notices – Ambient Monitoring Requirements, EPA Tasmania, 13 March 2013
- Jacobs Draft Report - TasWater response to project assessments, TasWater, 24 November 2014

B.18 Rosebery WWTP and pipeline construction

Project Name	New Rosebery WWTP
Primary Driver	Compliance
Organisation	Cradle Mountain Water
Service	Wastewater
Project Type	Historical
Jacobs Review Number	Project 18

CAPEX Budget (nominal)							
FY12/13	FY13/14	FY14/15	FY15/16	FY16/17	FY17/18	Beyond	Total
Breakdown not provided							\$9.4M

Project Description		
<p>The project involves the construction of a new Level 2 Wastewater Treatment Plant at Rosebery and a complete reconfiguration and upgrade of elements of the sewerage reticulation network to the new WWTP to service the town of Rosebery.</p> <p>A new treatment plant is required as sewage was historically treated by MMG (a private mining company) under an agreement whereby sewage was pumped to MMG's tailings dam 5 for pre-treatment. The heavily diluted effluent was then pumped from the interconnecting tailings dam 2 to MMG's Effluent Treatment Plant for discharge to Lake Pieman via their Bobadil Tailings dam. This arrangement involved Cradle Mountain Water accessing and utilising assets owned by MMG and is governed by MMG's discharge operating licence issued by the EPA. MMG gave notice to Cradle Mountain Water that it wishes to discontinue the arrangement prior to the 30 June 2015 as its business plan requires Tailings Dams 5 and 2 to be recommissioned to service the mine operations.</p>		
Is the project prudent?	Jacobs Assessment:	
<p>Jacobs finds that this project is prudent on a needs basis. It is aligned with TasWater's key drivers and could be reasonably expected to be undertaken by an operator exercising good industry practice given the circumstances of TasWater at the time the decision was made.</p> <p>Project need: The need for the project is well understood and although not mandated by the EPA, the failure to complete this project prior to MMG discontinuing services would result in significant non-compliance issues.</p> <p>It is noted that the project was initiated by Cradle Mountain Water, prior to the formation of TasWater, and therefore aligns with development of Cradle Mountain Water's sewerage networks/systems. Given that the project was initiated to provide complete separation of sewerage assets from MMG (at the request of MMG) the project needs to be completed for TasWater to be able to provide sewerage services to the community, a core objective of the business.</p> <p>Cost driver allocation: Jacobs agrees that there are multiple cost drivers for this project aligned with the Ring Fencing Guideline – including compliance and renewals. It is Jacobs' opinion that the primary driver is compliance.</p> <p>Project timing: The inclusion of the project within the PSP expenditure program is in line with the hard deadline set by MMG for discontinuation of use of its infrastructure for sewage treatment. The project business case was developed by Cradle Mountain Water and approved by the Board in November 2011.</p> <p>Planning horizon: It is understood that that the WWTP has been sized for peak wet weather capacity of 2.51 ML/day and a single day peak inflow capacity fully treated of 3.05 ML/day. No information has been sighted by Jacobs regarding the assumptions adopted for the sizing of the network or plant, including growth assumptions.</p> <p>Deliverability: According to the Business Case, the project was originally scheduled for completion in June 2015. The current expected date for practical completion is October 2015 with separation of sewerage from MMG expected in July 2015. Jacobs understands that TasWater has requested numerous meetings with MMG to discuss its project schedule and the implications of TasWater completing the project after 30 June 2015; however it is understood that little timely progress is being made. TasWater states that the variance from the</p>		

original program delivery has been due to:

- Uncertain time to taken to get the external project approvals (EPA and council),
- Additional time required complete WWTP D&C tender assessments and negotiations, and
- TasWater project management resourcing going through the major restructuring late 2013 and early 2014.

Is the project efficient?

Jacobs Assessment:



Based on the evidence provided, Jacobs find that the expenditure currently proposed to be efficient and consistent with an operator exercising good industry practice.

Options assessment and selection of the preferred option: A scoping study and a business case have been completed for the project. The options assessed primarily focused on the construction of one, or more, new WWTPs. These options considered were:

- Do nothing ,
- Construction and reestablishment of 4 discrete Level 1 WWTP's at their previous locations (Direens Corner, Park Road, Stirling Valley, Dalmeny Estate),
- Construction of a new Level 2 WWTP at the preferred location (Direens Corner), and
- Construction of a new Level 2 WWTP at an alternate location.

The preferred option in the Business Case is Option 3, however no evidence of consideration of non-infrastructure alternatives or a ranking process has been sighted. Subsequent to the Business Case, TasWater's RFI response states that:

"The following updates to the proposed scope of work from the business case have occurred.

- *The scope of the Park Road sewer pump station increased due the requirement identified to provide safe access for pump maintenance and reduce operational continuity risks during construction and commissioning of the pump station."*

The Rosebery Sewer Project Business Case Review, undertaken in June 2014, states *"The outcome of the WWTP tender process has not changed the recommended option from the Business Case (Section 3) or resulted in any alternative option being identified that requires further investigation or assessment."* Jacobs consider the adopted solution to be reasonable and justified.

Procurement Approach: The project is being delivered through three separate contracts: one for the sewer pipelines, on for the pump station upgrades, and one for the WWTP, which includes three discrete separable portions (design, construction and commissioning) to manage the risk of major contractual delays with the parallel external approvals process. The sewer pipelines and WWTP contracts have been competitively tendered and awarded, while the pump stations component is currently out to market. The pipelines and pump station tender was assessed using a two part process: Part 1 assessed capability using a weighted attribute score while Part 2 assessed price, while the WWTP tender was assessed on tender quality (50%) and value (50%) weighted criteria. Jacobs considers the delivery method to be acceptable and the tendering process in accordance with good industry practice.

The report for additional funding from the CWC Meeting, held on the 24 June 2014, included the following table.

Table 1 : Project costs summary

Item	Business Case Pre-Tender Upper Estimate	Spend to Date	Estimate to Complete	Variance
Planning & Approvals	\$1,502,000	\$911,315	\$1,532,000	\$30,000
WWTP site establishment	\$334,000	\$279,428	\$426,000	\$92,000
██████████	██████████	██████████	████████████████████	██████████
██████████	██████████	████████████████	████████████████████	██████████
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██████████	██████████	█	██████████	██████████
██████	██████████	██████████	██████████	██████████

Spend to Date as at 15 May 2014 Navision total costs

The Rosebery Sewer Project Business Case Review identifies the major changes and variance in project costs as:

- [REDACTED]
 - [REDACTED]
 - [REDACTED]
 - [REDACTED]
- Pipeline detailed design identified a risk of rock and ground water issues during construction.
 - Additional costs incurred to complete the WWTP site clearing and establishment.

The bases for the preliminary estimates undertaken for the Business Case have not been provided to Jacobs, however the main cause for the cost increase is associated with the WWTP. Given that a competitive tendering process was undertaken for the design and construction of the WWTP resulted in cost estimates significantly higher than allowed for in the Business Case, it appears that the cost for this component was under estimated in the initial planning stages. As marketed tested costs are the primary cause of the cost increase, Jacobs considers that the revised costs are efficient. Jacobs suggests that for future WWTP projects the significant variance identified for this project be taken into consideration.

The above indicates that the spend in 2014/2015 will be greater than indicated in PSP1 and that there is a likelihood that some expenditure will drift into 2015/2016.

Recommendations

In summary, Jacobs finds that the construction of a new Level 2 Wastewater Treatment Plant at Rosebery and a complete reconfiguration and upgrade of elements of the sewerage reticulation network to the new WWTP to be justified.

Although Jacobs has not sighted documentation relating to the options assessment process, i.e. potential consideration of non-infrastructure alternative, rankings or NPVs, it is considered that an appropriate solution has been adopted.

Jacobs considers that the project expenditure is efficient. A competitive tendering process has been or is being undertaken for each of the three contracts associated with the works and hence the costs are in line with market prices and efficient.

Assumptions

None

Reference Documentation



Jacobs has relied on the following documentation in its review:

- Rosebery Wastewater Treatment Plant Project Business Case, Version 1, Cradle Mountain Water, 14 November 2012
- CWC Meeting - Rosebery Sewer Project Request For Additional Funding, TasWater, 24 June 2014
- CWC Meeting - Rosebery Sewer Project Request For Additional Funding - Appendix 1 - Rosebery WWTP & Pipe Network Upgrade - Estimate to Complete, TasWater, 24 June 2014
- CWC Meeting - Rosebery Sewer Project Request For Additional Funding - Appendix 2 - Rosebery Sewer Project Business Case Review - June 2014, TasWater, 24 June 2014
- TasWater RFI Response - Jacobs RFI-9 CAPEX - Project 18 Rosebery WWTP, TasWater,
- Rosebery Sewer Project Program - Ver 31 July 2014, TasWater, 17 Oct 2014
- Rosebery Procurement Flow Chart - Revised, TasWater, 11 April 2013
- Rosebery Sewerage Pipelines - Tender Assessment Report, TasWater, 14 August 2014
- Rosebery WWTP Tender - Preferred Tender Recommendation Approval – Memo, TasWater, 23 May 2014

B.19 Tarooma Pump Station & Pressure Main Construction

Project Name	Tarooma Pump Station & Pressure Main Project
Primary Driver	Compliance
Organisation	Southern Water
Service	Wastewater
Project Type	Historical
Jacobs Review Number	Project 19

CAPEX Actual (nominal)						
FY10/11	FY11/12	FY12/13	FY13/14	FY14/15	FY15/16	Total
\$5.2M	-	-	-	-	-	\$5.2M

Project Description		
<p>The Tarooma Wastewater Treatment Plant (WWTP) receives sewage from the Kingborough suburb of Tarooma. The plant does not currently comply with its licence conditions. The project is proposed to involve the construction of a new Tarooma wastewater pump station, with associated detention tank and pressure main, to transfer wastewater to Lower Sandy Bay together with the removal of the existing Tarooma WWTP and the rehabilitation and landscaping of the site to rectify the non-compliance of the Tarooma WWTP.</p>		
Is the project prudent?	Jacobs Assessment:	
<p>Jacobs finds that this project is prudent on a needs basis. It is aligned with TasWater's key drivers and obligations, and could be reasonably expected to be undertaken by an operator exercising good industry practice given the circumstances of TasWater at the time the decision was made.</p> <p>Project need: The Tarooma WWTP is non-compliant with its current EPA discharge licence. This represents a clear regulatory need to take action to resolve these non-compliances. The Tarooma WWTP was ranked sixth (out of 33) on the 'Wastewater Treatment Plant (WWTP) Compliance – Priority List' issued by the EPA on 21 December 2009. Jacobs agrees that the 'do nothing' solution is not acceptable.</p> <p>Cost driver allocation: Jacobs agrees that there are multiple cost drivers for this project aligned with the Ring Fencing Guideline – including compliance, and renewals. It is Jacobs' opinion that the primary driver is compliance.</p> <p>Project timing: The project was initiated by Southern Water, with the Business Case submitted to the board in July 2010. The project was due to be completed by December 2011. No evidence of the commencement or completion of the project has been sighted by Jacobs.</p> <p>Planning horizon: Insufficient evidence has been provided to Jacobs to confirm the appropriateness of the sizing of the infrastructure selected. The Business Case states "an internal review of future developments in the next five years, by Kingborough Council 2010, predicted a nil or at best minimal growth."</p> <p>Deliverability: The Business Case states that the "project construction phase is expected to be approximately 9 months". The Business Case further states that the "time frame is subject to approval periods from DIER, Kingborough and Hobart Councils and State Government Crown Land. Approval times could add six months to the construction start date." No information regarding the delivery of the project has been provided.</p>		
Is the project efficient?	Jacobs Assessment:	
<p>It is Jacobs' opinion that insufficient information has been provided to allow a determination of the efficiency of the project to be made.</p> <p>Options assessment and selection of the preferred option: The options assessment discussed within the business case considered: replacement of the existing WWTP with a package MBR plant, a major upgrade of the WWTP to incorporate SBR technology,</p>		

construction of a pump station and rising main to other pump stations in the network, and a 'do nothing' option. Based on the high-level numbers provided in the business case, Jacobs notes that the new pump station and rising main option have significantly lower NPCs (least negative NPVs) than the options associated with upgrading or replacing the existing WWTP.

Insufficient evidence has been provided to Jacobs to support the robustness of this options assessment and the selection of the preferred solution. Some key observations are discussed below (note that these discussions exclude the unacceptable 'do nothing' option).

- While there is some qualitative discussion of the options assessment, no evidence has been provided that a structured multi-criteria analysis has been performed to systematically evaluate cost and non-cost factors and support the selection of the preferred option (Option 3).
- No details have been provided to allow the reasonableness of cost estimates to be tested. Jacobs has been advised that they are based on GHD estimates and more detailed analysis by Southern Water. No details of contingency, engineering or risk allowances adopted in the cost estimate have been provided. Nor has substantiated actual cost information been provided from project records.

Procurement Approach: No details are included in the Business Case in relation to how the project was to be delivered. Given the value of the project, Jacobs would have expected a competitive tendering process to be undertaken. As no further information has been regarding the project it uncertain whether these timeframes were achieved.

Recommendations

As discussed above, it is Jacobs' opinion that Jacobs finds that this project is prudent, on a needs basis, but not efficient due to a lack of supporting documentation to allow a determination of the efficiency of the project to be made.

Assumptions

None

Reference Documentation


Jacobs has relied on the following documentation in its review:


- Board Meeting Report - Regional Wastewater Treatment Strategy Stage 1: Taroona Pump Station & Pressure Main to Sandy Bay Project - Business Case , 2 July 2010, Southern Water
- Wastewater Treatment Plant (WWTP) Compliance – Priority List, 21 December 2009, EPA

B.20 Berriedale to Elwick Pipeline Duplication

Project Name	Berriedale to Elwick Pipeline Duplication
Primary Driver	Growth / Improvement
Organisation	Southern Water
Service	Water
Project Type	Historical
Jacobs Review Number	Project 20

CAPEX Budget (nominal)							
Previous	FY09/10	FY10/11	FY11/12	FY12/13	FY13/14	FY14/15	Total
-	-	\$4.17M	\$2.17M	-	-	-	\$6.33M

Project Description		
<p>The Berriedale to Elwick water pipeline link is highly critical as, during the peak summer period, a failure which could not be repaired 'live' would result in the risk of restrictions to greater Hobart including Kingsborough and Sorell. The presence of a single bulk water supply pipeline at this location presents a significant risk to the business both in terms of reliability of supply and the ability to respond to increases in demand.</p> <p>The scope of this project is to duplicate the West Derwent pipeline between the Berriedale Pits and the Elwick Pump Station. The pipeline will be approximately 3.2 km of 813 mm mild steel cement lined (MSCL) fully welded pipe (the same size as the existing pipeline). Incorporated in these works is construction of a new valve pit, installation of a new isolation valve at the Berriedale Pits and all other associated valves and fittings.</p>		
Is the project prudent?	Jacobs Assessment:	
<p>Jacobs finds that this project on balance is prudent on a needs basis. It is aligned with TasWater's key drivers and improvements, and could be reasonably expected to be undertaken by an operator exercising good industry practice given the circumstances at the time the decision was made. However, no evidence of completion and hence capitalisation of the project has been provided by TasWater.</p> <p>Project need: The single West Derwent 1 pipeline to the Elwick Pits was identified by Hobart Water as a critical section for the reliability of the system and bottleneck for flow. The presence of a single bulk water pipeline in this section of the bulk water supply network presents a number of risks, including: potential water restrictions should the pipeline suffer a significant failure, proportioning of flows from Bryn Estyn due to the limitations in capacity of the system and operational risks. Jacobs agrees that the 'do nothing' solution is not acceptable.</p> <p>Cost driver allocation: The Business Case does not specifically identify project drivers however it discusses 'increasing reliability and capacity' and 'high growth areas' in the objective of the project, indicating project drivers of improvement and growth. It is Jacobs' opinion that the primary driver is improvement.</p> <p>Project timing: The project was initiated by Southern Water, with the Business Case submitted to the board in October 2010. The project was due to be completed in October 2011. No evidence of the commencement or completion of the project has been sighted by Jacobs and a response to this RFI question was not received from TasWater.</p> <p>Planning horizon: Insufficient evidence has been provided to Jacobs to confirm the appropriateness of the sizing of the infrastructure selected. The Business Case states "As a minimum, the proposed section of pipeline must be capable of supplying the current level of supply in the event of a large scale failure of the existing main. Additionally, hydraulic modelling has indicated that a nominal bore of 900mm will achieve projected flows over the next 25 years." The Business Case goes on to state: "Due to the uncertainty of future demand, both post-meters and into the future, it is suggested that the duplication is kept at the same diameter as the existing pipeline." No evidence to support this assumption has been provided.</p> <p>Deliverability: The delivery program outlined in the Business Case appears to be reasonable for the works required. As stated above, the project was due for completion in October 2011. No confirmation of this has been provided.</p>		

Is the project efficient?	Jacobs Assessment:	
<p>Insufficient information has been provided to demonstrate that the project is efficient. Only the business case has been sighted, which raises unanswered questions regarding options assessment and pipeline sizing.</p> <p>Options assessment and selection of the preferred option: The options assessment discussed within the business case considered: a 'do nothing' scenario, delaying the capital expenditure and replacing this financial year. Insufficient evidence has been provided to Jacobs to support the robustness of this options assessment and the selection and sizing of the preferred solution. Only the project business case has been sighted. Some key observations are discussed below (note that these discussions exclude the unacceptable 'do nothing' option).</p> <ul style="list-style-type: none"> • No consideration of non-infrastructure alternatives. • While there is some qualitative discussion (i.e. bullet points) of the options analysis (risks and opportunities), no evidence has been provided that a structured multi-criteria analysis has been performed to systematically evaluate cost and non-cost factors and support the selection of the preferred option (Option 2). • No capital, operating or NPV estimates have been sighted. • The business case indicates that the new infrastructure has been sized based on the existing line not taking into consideration growth. Evidence of this decision making process has not been provided. • No details have been provided to allow the reasonableness of cost estimates to be tested. Jacobs have been advised that they were developed by the engineering consultant engaged for the design of the pipeline. The level of contingency incorporated within this budget is 20% for all costs other than the supply of pipe and valves which has a contingency of 10% as per SW's Capital Project Governance policy. <p>Procurement Approach: No details are included in the Business Case in relation to how the project was to be delivered. Given the value of the project, Jacobs would have expected a competitive tendering process to be undertaken. As no further information has been regarding the project it uncertain whether these timeframes were achieved.</p>		
<p>Recommendations</p>		
<p>As discussed above, it is Jacobs' opinion that Jacobs finds that this project is prudent, on a needs basis, but not efficient due to a lack of supporting documentation to allow a determination of the efficiency of the project to be made.</p>		
<p>Assumptions</p>		
<p>None</p>		
<p>Reference Documentation</p>		
<p>Jacobs has relied on the following documentation in its review:</p> <ul style="list-style-type: none"> • Agenda Item No. 6 - Berriedale to Elwick Pipeline Duplication Business Case, Board Meeting Report - 8 October 2010, Southern Water, 8 October 2010 		

Appendix C. Summary of key recommendations and improvement opportunities

This whole report can be considered a set of findings, recommendations and improvement opportunities for TasWater. This table has been prepared to serve as a quick reference 'punch list' of recommendations and improvement opportunities that Jacobs believes should be actioned by TasWater (TW), sometimes with the involvement of the Economic Regulator (TER).

The recommendations and improvement opportunities have been assigned a number (specifically for this table) and the relevant sections of the report have been added so that the context of the recommendations can be referenced.

No.	Report Section	Description	Parties
Strategic Planning and Asset Management Review			
1	2.1.1	<p><i>Overall status of TasWater's Asset Management System</i></p> <p>Given TasWater is seeking to align its AM System with the ISO 5500X standards, it is recommended to employ the IAM Self-Assessment Methodology tool as it progresses through its Asset Management improvement 'journey'.</p>	TW
2	2.2.2	<p><i>Review of TasWater's AM System against the 10 'key elements' of ISO 55000:2014</i></p> <p>It is recommended that responsibilities be formally assigned within the current AM Improvement Strategy document and ultimately reside in the Strategic Asset Management Plan (SAMP).</p>	TW
3	2.2.2	<p><i>Review of TasWater's AM System against the 10 'key elements' of ISO 55000:2014</i></p> <p>Jacobs has observed that specific obligations and performance targets have been used within certain tactical documentation (such as the draft Sewer Renewals Strategy), but has not seen them consistently referenced in business cases. Including these consistently in business cases is a recommended improvement opportunity.</p>	TW
4	2.2.4	<p><i>Developing AM System Overall</i></p> <p>Jacobs endorses TasWater's proposed approach of a developing an AM improvement strategy/plan and concurrently implementing other high priority AM activities. Jacobs have not been provided the draft AM Improvement Strategy but would expect/recommend that all proposed AM improvement activities are adequately defined, scoped, costed, scheduled, and have an associated RACI responsibility matrix necessary for ASOC endorsement/approval.</p>	TW
5	2.2.4	<p><i>Developing AM System Framework</i></p> <p>WSAA and its member utilities are currently delivering several projects that seek to deliver guidelines to help Australian urban water utilities apply ISO 55001:2014 to their organisations, and to update Aquamark to address new aspects presented by this ISO Standard. It is recommended that these guidelines are strongly considered by TasWater as it progresses the development of its Asset Management system.</p>	TW
6	2.2.4	<p><i>Developing Other Asset Management Documentation</i></p> <p>TasWater should ensure that, for any risk-based decision making frameworks it develops, the framework should:</p> <ul style="list-style-type: none"> - Conduct a performance assessment of all assets - Define critical and non-critical assets - Include processes for the identification, assessment and selection of options to address unacceptable performance and risk "gaps" on a prioritised basis - Include processes for assessment and capture of benefits of capital works and other AM initiatives 	TW

No.	Report Section	Description	Parties
7	2.2.4	<i>Other Asset Management Documentation</i> Jacobs recommends that, where available, TasWater develop and test its decision making processes with the relevant WSAA Asset Management Guidelines (e.g. GSS1 Sewer Blockage Management).	TW
8	2.2.5	<i>Strategic Asset Management Plan (SAMP)</i> TasWater and the Regulator should make sure there are clear and aligned expectations on which Asset Management Plan is required to satisfy TasWater's Water and Sewerage Licence – whether TasWater's SAMP and/or its suite of AMPs.	TW & TER
9	2.2.6	<i>Asset Management Plans</i> TasWater should investigate a risk-based approach to the development of the AMPs – their timing and level of detail. It may be appropriate to develop some lower risk/priority system AMPs at a high level, while other higher risk/priority systems developed at a detailed level.	TW
10	2.2.6	<i>Asset Management Plans</i> Interaction of AMPs with TasWater's other regulated plans (WWMP, DWQMP, DSMP and EMP) needs to be considered to ensure that documentation is minimised and consistency is maintained. The possibility of using standard data reports for certain sections of the AMPs from TasWater's impending AMIS should be investigated (renewals profiles, service performance levels, etc.).	TW
11	2.2.7	<i>Implementation of Asset Management Plans</i> Develop the supporting processes to control the implementation of its AMPs such that high risk/priority AMPs can maturely inform TasWater's PSP submission for its third regulatory period. It is also recommended that checks in place to ensure the current Capital Planning and Prioritisation process is updated to reflect these supporting processes.	TW
12	2.2.10	<i>Performance Evaluation and Improvements</i> It is recommended that the Asset Management Improvement Strategy to clearly identifies and addresses the performance evaluation and improvements requirements outlined in ISO 55001:2014 (e.g. internal auditing requirements for the AM system and corrective actions for non-conformances).	TW
13	2.3.1	<i>TasWater's Capital Planning and Prioritisation Process</i> Jacobs has found that TasWater's capital planning and prioritisation process has been appropriate for its PSP2 submission. However, the process will need to be refined for future regulatory submissions. TasWater should consider making some further improvements: <ul style="list-style-type: none"> - Develop a more robust and consistent approach to cost estimating - Sensitivity testing of project priorities (e.g. risk assessment and strategic objectives weightings) - Alignment of Project Infrastructure Type and Asset Class definitions with the asset categories in the Ring Fencing Guideline - Allow for project expenditure to be apportioned across multiple Ring Fencing cost drivers, asset categories and business segment. Identify the intended RAB to which the expenditure will be capitalised	TW
Capital Expenditure Review			
14	3.2.2	<i>TasWater's PSP2 submission</i> TasWater's draft PSP2 submission insufficiently justifies the proposed level of capital expenditure compared to what would be expected from a mature water utility. Jacobs recommends that TasWater should more clearly articulate in its final PSP2 submission: its committed and uncommitted expenditure; how it proposes to manage and communicate the delivery of its oversubscribed Capital Works Program as it approaches and progresses through PSP2.	TW
15	3.2.2	<i>Risk-based costing instead of standard contingency allowances</i> Jacobs recommends that TasWater incorporate risk-based costing into its capital planning and prioritisation process so that the different levels of uncertainty around project costs at different gates can be explicitly presented (P50, P90, etc.).	TW

No.	Report Section	Description	Parties
16	3.3.2	<p><i>Future PSP submissions</i></p> <p>Jacobs recommend that, given TasWater should be a more mature utility, a more rigorous be enforced for the PSP3 independent expenditure review (e.g. through a revision of the prudency test and efficiency test definitions). It is Jacobs' opinion that the reverse position should be adopted by an independent expenditure reviewer, namely that without adequate supporting robust information to support the proposed solution, expenditure and timing some adjustment should be made as a matter of course.</p>	TER & TW
17	3.3.3	<p><i>TasWater Business Cases</i></p> <p>TasWater's business cases need substantial improvements. Jacobs has made several general recommendations for TasWater to consider for future business cases (and PSP submissions).</p>	TW
18	3.5	<p><i>Asset and Capital Expenditure Classifications - AMIS</i></p> <p>TasWater should ensure the AMIS it implements is compatible with its regulatory accounting and reporting requirements</p>	TW
19	3.5.1	<p><i>Asset and Capital Expenditure Classifications</i></p> <p>TasWater and the Regulator should confirm the approach that must be taken to classify capital expenditure on existing (pre-July 2009) assets – to understand their impact on the RAB_{existing} and RAB_{new}</p>	TW & TER
20	3.5.2	<p><i>Asset and Capital Expenditure Classifications – Apportionment across cost drivers</i></p> <p>TasWater should develop and implement a process so that capital expenditure is apportioned to multiple cost drivers and asset categories for its regulated accounts.</p>	TW
21	3.5.3	<p><i>Asset and Capital Expenditure Classifications- Asset Lives</i></p> <p>TasWater should establish improve the granularity of its asset life assumptions</p>	TW
22	3.5.4	<p><i>Inclusion/exclusion of demand-driven reuse schemes in the RAB</i></p> <p>Jacobs recommends that meaningful discussions should still be held between TasWater and the Regulator to discuss the inclusion/exclusion of discharge-driven re-use schemes from the RAB (i.e. whether regulated or unregulated assets/expenditure); and the intent, incentives and implications of the clauses in the Regulator's PSP Guideline and Ring Fencing Guideline.</p>	TW & TER
23	3.5.5	<p><i>Asset and Capital Expenditure Classifications- capitalisation of CCTV</i></p> <p>TasWater and the Regulator should ensure there is agreement on the interpretation of the Water and Sewerage Accounting Ring-fencing Guidelines relating to the proposed capitalisation of CCTV (and other investigation activities).</p>	TW & TER
Operating Expenditure Review			
24	4.2	<p><i>Review of actual and budgeted operating expenditure (2012/13 – 2014/15)</i></p> <p>Jacobs recommend the following key focus improvement areas for TasWater's operating expenditure:</p> <ul style="list-style-type: none"> - Improved information, ability and capability to explain the key drivers and reasons for changes in operating expenditure business segments (e.g. water and sewerage) and activity areas and to substantiate that narrative with documented evidence. - Development of strong linkages between the capital and operational planning processes and the operating expenditure planning process. - In a related sense, linking of operating expenditure and service level requirements and outcomes. - An ongoing focus on the future efficiency benefits from the merger and more generally. - Improved understanding of the difference between the financial and regulatory treatment of operating expenditure items and greater focus on the statutory operating expenditure limit set by the Regulator. - Greater rigour around the regulatory operating expenditure estimate for each year of the review period in general including the ability to reconcile various views of expenditures from different sources (for differing purposes within TasWater), particularly in terms of actual regulatory operating expenditure, and to ensure ongoing management, review and reprioritisation of regulatory operating expenditure occurs 	TW

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