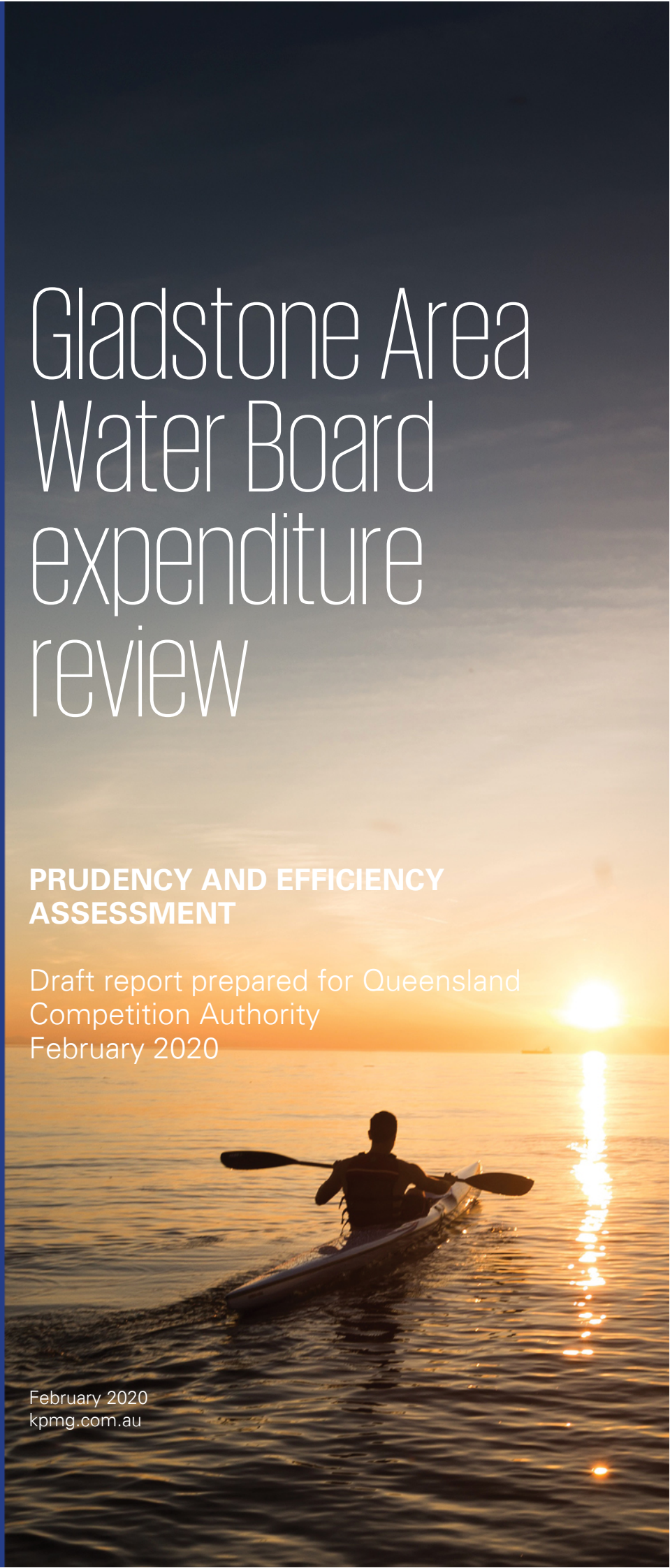
KPMG

Gladstone Area Water Board expenditure review

PRUDENCY AND EFFICIENCY ASSESSMENT

Draft report prepared for Queensland Competition Authority
February 2020



February 2020
kpmg.com.au

Important notice

This draft KPMG report was produced solely for the use and benefit of the Queensland Competition Authority, and cannot be relied on or distributed, in whole or in part, in any format by any other party. This report is dated 4 February 2020, and KPMG accepts no liability for and has not undertaken work in respect of any event subsequent to that date which may affect this report. If you are a party other than the Queensland Competition Authority, KPMG:

- owes you no duty (whether in contract or in tort or under statute or otherwise) with respect to or in connection with the attached report or any part thereof; and
- will have no liability to you for any loss or damage suffered or costs incurred by you or any other person arising out of or in connection with the provision to you of the attached report or any part thereof, however the loss or damage is caused, including, but not limited to, as a result of negligence.

If you are a party other than the Queensland Competition Authority and you have not executed a formal letter of reliance with KPMG, if you choose to rely upon the attached report or any part thereof, you do so entirely at your own risk.

Limitations

The responsibility for determining the adequacy or otherwise of our Terms of Reference is that of the Queensland Competition Authority.

The services provided under our engagement contract ('Services') have not been undertaken in accordance with any auditing, review or assurance standards. Any reference to 'audit' and 'review', throughout this report, is not intended to convey that the Services have been conducted in accordance with any auditing, review or assurance standards. Further, as our scope of work does not constitute an audit or review in accordance with any auditing, review or assurance standards, our work will not necessarily disclose all matters that may be of interest to Queensland Competition Authority or reveal errors and irregularities, if any, in the underlying information.

In preparing this draft report, we have had access to information provided by Queensland Competition Authority, by the Gladstone Area Water Authority in response to information requests, and publicly available information. We have relied upon the truth, accuracy and completeness of any information provided or made available to us in connection with the Services without independently verifying it.

Any findings or recommendations contained within this draft report are based upon our reasonable professional judgement based on the information that is available from the sources indicated. Should the project elements, external factors and assumptions change then the findings and recommendations contained in this report may no longer be appropriate. Accordingly, we do not confirm, underwrite or guarantee that the outcomes referred to in this report will be achieved.

We do not make any statement as to whether any forecasts or projections will be achieved, or whether the assumptions and data underlying any such prospective financial information are accurate, complete or reasonable. We will not warrant or guarantee the achievement of any such forecasts or projections. There will usually be differences between forecast or projected and actual results, because events and circumstances frequently do not occur as expected or predicted, and those differences may be material.

Glossary

AC	Asbestos Cement	**DNRME**	Department of Natural Resources Mines and Energy
AEMC	Australian Energy Market Commission	**DWQMP**	Drinking Water Quality Management Plan
AER	Australian Energy Regulator	**ERP**	Enterprise Resource Planning
AFC	Acceptable Flood Capacity	**ESC**	Essential Services Commission
ALARP	As Low As Reasonably Practicable	**ESCOSA**	Essential Services Commission of South Australia
ANCOLD	Australian National Committee on Large Dams	**FTEs**	Full Time Equivalents
ANZSIC	Australian and New Zealand Standard Industrial Classification	**GAWB**	Gladstone Area Water Board
APMP	Asset Portfolio Master Plan	**GRC**	Gladstone Regional Council
AWOTE	Average Weekly Ordinary Time Earnings	**GWTP**	Gladstone Water Treatment Plant
BST	Base-Step-Trend	**ICT**	Information and Communication Technologies
CAGR	Compound Annual Growth Rate	**IDC**	Interest During Construction
CCF	Community Consultative Forum	**IPART**	Independent Pricing and Regulatory Tribunal
CCI	Council Cost Index	**ISO**	International Organisation for Standardisation
CMMS	Computerised Maintenance Management System	**ISR**	industry special risk
CFD	computational fluid dynamics	**LCMPs**	Life Cycle Management Plans
CPI	Consumer Price Index	**LGAQ**	Local Government Association of Queensland
CSS	Contingent Supply Strategy	**LRV**	log reduction value
DAE	Deloitte Access Economics	**M**	Million

DAEM	Deloitte Access Economics Macroeconomic Model	**LGC**	Large-scale generation certificates
DCWC	Donald Cants Watts Corke	**LRET**	Large-scale Renewable Energy Target
ML	Megalitre	**MCA**	Multi Criteria Analysis
MV	Medium Voltage	**RAB**	Regulated Asset Base
NHMRC	National Health and Medical Research Council	**RBA**	Reserve Bank of Australia
NPV	Net Present Value	**ROL**	Resource Operations Licence
OAMF	Office Accommodation Management Framework	**SCADA**	Supervisory Control and Data Acquisition
p.a.	Per Annum	**VFDs**	Variable Frequency Drives
PIR	Post Implementation Reports	**WPI**	Wage Price Index
PMF	Project Management Framework	**WTP**	Water Treatment Plant
PPI	Producer Price Index	**WSAA**	Water Services Association of Australia
PREMO	Performance, Risk, Engagement, Management and Outcomes	**YWTP**	Yarwun Water Treatment Plant
QCA	Queensland Competition Authority		
R2a	Risk & Reliability Associates		

1 Executive summary

1.1 Introduction

Established in 1973, GAWB is a commercialised statutory authority owned by the Queensland Government. GAWB owns and operates Awoonga Dam on the Boyne River together with a network of pipelines, pump stations, reservoirs and treatment plants. It provides bulk raw and potable water to industrial customers, power stations and the Gladstone Regional Council (GRC).

On 1 October 2000 GAWB commenced operations as a Category 1 commercialised Water Authority under the *Water Act 2000*. As from the 1st July 2008, GAWB became a registered service provider under the *Water Supply (Safety and Reliability) Act 2008*.

GAWB's purpose is to ensure the long and short term water needs of current and future customers are met in ways that are environmentally, socially and commercially sustainable.

Figure 1: GAWB's major assets

Source: GAWB's submission 2021-25 Period

GAWB supplies potable water to the GRC and 33 domestic connections located around Lake Awoonga. This represents approximately 20% of annual water supplied. The remaining 80% of water volume is supplied to industrial customers.

The Queensland Competition Authority (QCA) are investigating the prices that GAWB is planning to charge for the period 2020–25, under direction from the Queensland Government. In particular, the QCA is assessing whether the total cost of the bulk water services proposed by GAWB will be prudent and efficient.

To support its investigation, the QCA has engaged KPMG to independently assess the prudency and efficiency of GAWB's forecast operating and capital expenditure (opex and capex respectively) associated with its bulk water supply activities and the appropriateness of GAWB's proposed rates for escalating current costs into the future. Specifically, in accordance with our Terms of Reference and at the request of the QCA, KPMG evaluated:

- GAWB's forecast opex and capex over the period 1 July 2020 to 30 June 2025;
- GAWB's actual capex (to the extent available) over the period 1 July 2015 to 30 June 2020;
- GAWB's capital planning and governance arrangements; and
- Escalation rates proposed by GAWB.

An assessment of the historical and forecast expenditure levels represents a critical component in any investigation of water prices.

To do this, and consistent with the QCA's Terms of Reference, we have assessed the prudency and efficiency of GAWB's expenditure forecasts. To do this, we have adopted the following definitions*:*

- Prudent, if it can be justified by reference to an identified need or cost driver; and
- Efficient, if it is the least cost to deliver on an appropriately defined scope and standard of works and minimises GAWB's long-run costs of providing services.

Where KPMG has assessed expenditure as not prudent or inefficient, we have either identified appropriate adjustments to the proposed expenditure profile provided by GAWB to better align with that of a prudent or efficient service provider, or we have excluded the expenditure from the forecast altogether.

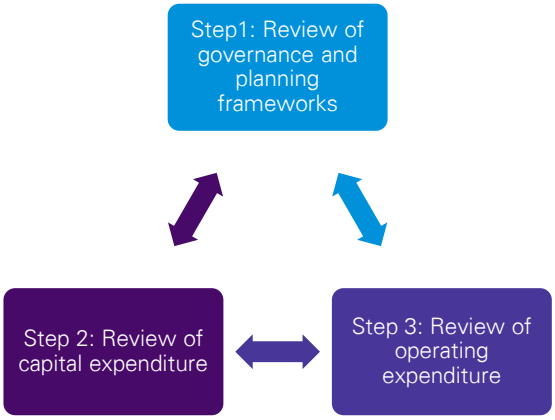
We have also identified a number of suggested improvements where potential further efficiencies could be achieved or which could help GAWB and QCA to transparently consider the efficiency and prudency of the business in future years.

1.2 Our approach

To support the QCA with its investigation, KPMG has approached this task by focusing on three separate, though interrelated, steps as shown in Figure 2, below.

As Step 1, KPMG reviewed GAWB's governance arrangements and planning frameworks for consistency with good industry practices, providing for appropriate controls (e.g. approval) and the mitigation of potential risks. This provided the context for KPMG to review the prudency and efficiency of GAWB's historical and forecast capital expenditure (Step 2) and operating expenditure (Step 3).

Figure 2: KPMG assessment approach



In completing each step, KPMG has:

1 **Reviewed governance and planning frameworks**: Completed a desktop review of GAWB's supporting policies and procedures detailing its overarching governance and planning frameworks. KPMG then tested the application of GAWB's supporting governance and planning frameworks in the development of its capex and opex proposals to the QCA.

2 **Reviewed capital expenditure:** Completed a review of GAWB's historical and forecast capex in three stages, first at a portfolio level, second at a sample project level, and the third stage was to identify any systemic issues, based on the project reviews.

   At a project level, KPMG has completed detailed reviews of three historical and seven proposed major projects ranging in size from $4 million to $61 million. These projects are driven by growth, compliance, renewals and service improvements or a combination of these factors.

3 **Reviewed operating expenditure**: Evaluated the prudency and efficiency of GAWB's forecast operating expenditure to address the QCA's scope. For similar expenditure reviews, KPMG has employed a base-step-trend approach. This approach establishes an efficient base year, rolls forward the efficient base operating expenditure to take account of scale growth, input price growth and efficiency improvements plus any adjustments for material step changes to costs.

   The data and information provided by GAWB was not in a suitable format or sufficiently granular for KPMG to apply this approach. Therefore we have adapted our approach to address the QCA's scope. There are three key steps to our assessment of GAWB's operating expenditure:

   – Review of the previous expenditure review
   – Assessment of historical and forecast expenditure and forecasting method
   – Further investigation of particular cost categories

1.3 Our findings and recommendations

1.3.1 Asset management and capital planning

GAWB is an asset intensive organisation which means its objectives include coordinating activities to realise customer value from its asset base. A number of key asset management artefacts were tested against leading practice frameworks to assess the appropriateness of GAWB's asset management and capital planning approach.

To properly assess the asset management and capital planning processes of this type of organisation, we have utilised the International Standard, ISO55001 which requires a management system approach to asset management. Where business functions are not sufficiently covered by ISO5500, associated and referenced documents have been used such as the Global Forum on Maintenance and Asset Management's Landscape that covers the globally agreed 39 subjects of asset management.

GAWB have demonstrated a commitment to continuous improvement of their asset management system and alignment with leading practice frameworks, this is evident in their successful certification against ISO55001 and implementation of a number of asset management improvement initiatives.

The following details our overarching findings:

- GAWB's Asset Management Strategy references their asset management objectives and defines minimum supply standards. To ensure alignment between the organisation's strategic objectives and decision-making criteria GAWB should consider demonstrating how the minimum supply standards support the organisation to achieve its asset management objectives.

- GAWB have developed an Asset Management Improvement Plan (Plan). A number of improvement initiatives identified in interviews with GAWB staff were not detailed in this Plan. These included ongoing work on criticality to cascade it to an asset level (it is currently defined at an asset class level).

- GAWB's Asset Management Plan identifies data quality as a limitation to their asset management decision making capability - due to the poor quality and availability of historical data prior to 2009 when some asset management functions were outsourced. Interviews with GAWB employees identified an opportunity to implement a continuous improvement approach to managing data quality to improve asset management decision-making processes. GAWB should consider developing an asset information strategy, or updating the asset management strategy, to detail data quality requirements, current state deficiencies and a roadmap for how the organisation will meet these requirements.

Lifecycle Management Plans (LCMPs) are a critical component of GAWB's asset management system. LCMPs have been developed for individual asset classes and provide a basis for opex and capex forecasting at an asset class level. For LCMPs, it is observed that:

- It is not clear how levels of service detailed in the LCMPs relate to asset management objectives and customer service delivery outcomes. GAWB should consider updating the plans to detail alignment between levels of service and asset management objectives.

- It is not clear how life limiting factors detailed in the LCMPs have been identified and relate to the application of asset intervention models or customer service delivery outcomes. GAWB should consider updating the plans to detail how life limiting decision-making criteria are systematically identified and support the achievement of asset management objectives.

- LCMPs are typically reviewed in a workshop with representatives from relevant business units. Information provided by GAWB indicated that during these workshops asset health and performance is considered in the review. GAWB should consider updating the LCMP review process detailed in the Asset Management Plan to include consideration of asset performance and health on a consistent basis.

- GAWB should consider consolidating the number of LCMPs that they manage to streamline the review and forecasting process.

GAWB have implemented a risk-based capital planning process dependent on a gateway approach. GAWB have adopted a people-based approach to prioritisation of investment options to develop an approved capital plan, with prioritisation and finalisation of the capital plan (GAWB's Major Capital Projects Work List) occurring in periodic review workshops. It is observed that to improve transparency and repeatability in the process for prioritisation and finalisation of the capital plan GAWB should consider documenting decision-making criteria, for example the development of a quantified cost benefit analysis methodology aligned with GAWB's strategic objectives.

1.3.2 Corporate governance and procurement

KPMG's review of GAWB's procurement and governance process indicated a robust end-to-end process supported by guidelines and templates. This is consistent with best industry practice and provides a level of confidence in the underlying processes supporting the expenditure forecasts. The procurement practices demonstrate a commitment to supporting the Queensland economy and providing local jobs. Alignment was evident between procurement strategies and business templates demonstrating how strategic principles are embedded in day-to-day procurement decisions. Overall, GAWB procurement process reflects a high standard and provide a strong foundation to the efficiency of the forecasts.

Two suggested areas of improvement were identified in our review:

1. To improve process transparency GAWB should consider reviewing specific key artefacts to ensure that mandatory requirements are clearly defined.
2. It is observed that the Project Review Committee serves a significant asset management function but is not currently included in the Asset Management Strategy Map. GAWB should consider updating the Asset Management Strategy Map to include the monthly Project Review Committee meeting as a decision-making forum.

During this review, KPMG uncovered the following issues that when addressed, would improve the prudency and efficiency of GAWB's capital forecasting. These are summarised below.

Project estimating tool

GAWB has provided base project estimating tool models for monthly and weekly project projections, which are comprehensive and based on standard internal costs with standard escalation factors, and allowing provision of quoted material and service costs and timing. KPMG has not sighted the use of these spreadsheet tools in the historical projects reviewed, suggesting these tools (developed in November 2017) which link to the Project Management Framework (which was initially published in September 2016) have yet to fully be implemented.

There is an inadequate application of the capital planning and governance framework evidenced by the divergence of the actual capex outcomes from the forecast capex available for review in the lead up to the QCA's decisions for the 2015-2020 regulatory period. KPMG recommends that these new frameworks be fully practically implemented, if not already, to reduce the variance between the approved capex at the gateway to proceed to the implementation phase and the actual outcomes at commissioning.

Capital planning and governance

GAWB needs to more rigorously implement its capital governance framework in order to demonstrate in the next price monitoring investigation, that is has been able to keep actual capex within the accuracy and escalation factors envisioned in its capex frameworks. While KPMG's review has seen better

documentation on the forecast projects being proposed by GAWB, additional proof of compliance will need to be available towards the end of the next regulatory period.

1.3.3 Capital expenditure

KPMG's analytical approach of GAWB's historical and forecast capex was done in three stages, first at a portfolio level, second at a project level and the third stage was to identify systemic issues based on the project reviews. At a project level, KPMG has completed detailed reviews of three historical and seven proposed major projects ranging in size from $4 million to $61 million. These projects are driven by growth, compliance, renewals and service improvements or a combination of these factors.

Further, we have also sought to assess, at a program wide level, whether there are any systemic issues with regard to how GAWB has completed its capital forecasting. These systemic issues are determined by assessing whether GAWB has appropriately implemented its capital planning and asset management framework for the selection of projects reviewed, and whether there are any consistent shortfalls in meeting the expectations for prudency and efficiency. Where there is a shortfall, we have sought to make an adjustment to the remaining program of works.

When assessing the prudency and efficiency of individual projects, we have applied the following review process to those projects with significant forecast expenditure in the next regulatory period:

- For historical projects which the QCA has previously accepted as prudent for the 2015-20 regulatory period, the focus is on the efficiency of delivery, unless the project scope has expanded significantly from that subject to the prior review where additional consideration might be warranted.
- If a project is not demonstrated to be prudent, then:
  - For projects delivered during the current regulatory period (2015-20) but not previously subject to a prudency review, these projects should not be rolled into the RAB; and
  - For projects proposed to be delivered during the next regulatory period (2020-25), these projects be excluded from the capital program used to set the RAB.
- where a project is at an early stage in the investment governance process (that is, within Gates 0-2 of the PMF) and, while considered to be prudent:
  - there is insufficient supporting information to clearly demonstrate the efficiency of the project, we have recommended exclusion of that project from the proposed capital program; and
  - there is sufficient information to demonstrate the efficiency of the project, however that information could be improved, we have adjusted the forecast to one that better reflects the efficient costs of the project/program, given the current level of information provided.
- where a project is determined to be both prudent and efficient (i.e. the supporting documentation demonstrates the scope, standard and cost of works), it is appropriate that this expenditure be considered in determining pricing for the regulatory period (2020-25).

KPMG has reviewed the documents provided on three historical projects which have been completed in the current 2015-2020 regulatory period, and seven forecast projects which are projected to be commissioned in the next 2020-2025 regulatory period. The following comments summarise KPMG's recommendations following the review of this documentation against the capex planning and cost estimation frameworks which GAWB has adopted.

Historical capex (2015-20)

To assess the prudency and efficiency of GAWB's historical capex, KPMG:

- Compared actual expenditure against the budget set during the 2015-20 price monitoring investigation, in particular for major projects and by driver;
- Completed a review of three capex projects that were delivered, where there were material variations in scope or cost;
- Recommended adjustments (where appropriate) to those projects, to reflect our assessment for prudency and efficiency.

Analysis of historical expenditure

GAWB expects to capitalise $122.48 million of projects over the current regulatory period, $20.95 million more (or 21 per cent) than that which was accepted as prudent and efficient for the 2015-20 regulatory period by the QCA.

Analysis of GAWB's largest ten capital projects demonstrated a material average overspend of capital against the budget set. The average overspend is 38 per cent across all ten projects. Of the 10 projects assessed, six exhibited overspends, with an average overspend of 70 per cent.

Further investigation of all projects delivered identified that:

- GAWB forecast to complete 206 unique projects[1] with a value of $105.8 million, during the five years 2014-19;
- Of these projects, 122 have been completed;
- Of these 122, KPMG was provided with data that allowed comparison of forecast and actual expenditure for 79 projects delivered between 1 July 2014 and 30 June 2019[2]. Given our assessment that both the Offline Storage and Repump project and the Awoonga Dam VFD Replacement project were prudent and efficient (see Table 1), we have removed these from the sample of 79 projects (so as not to skew the analysis). Of the remaining 77 projects:
  - They were forecast to cost $54.85 million, but were delivered for $66.69 million;
  - Of the 77 projects, the total variance was an average 22 per cent overspend:
    - 40 of these 77 projects overspent against the budgeted allowance, by a total of 35 per cent;
    - 19 of these 79 projects underspent against the budgeted allowance, by a total of 23 per cent; and
    - 18 of these 79 projects were within budget (within +/- 10 per cent).
- 22 projects were cancelled at a saving of $0.94 million;
- 23 projects were deferred/postponed, at a saving of $5.65 million;
  - Of the 23 postponed, 10 have been included within the 2020-25 capital forecast at a value of $1.47 million.

A 22% average overspend for the 77 projects that could be compared with their forecast, is material, noting these project budgets all included contingency reflective of the stage of the planning process they were at. Based on the analysis of major projects and all projects delivered (2014-19), there may

[1] This is the number of unique project numbers assigned in the sheet "Actual capex 2015-19" in *RFI 33-34 Actual Capex 2015-19*. This excludes $11.8 million of replacement capex of existing assets, which doesn't have a project number assigned.
[2] Within GAWB's response to RFI33-34, it provided the forecast allowance for the 2015-20 period and actual capex for the 2014-19 period.

be a systemic issue with the delivery of capital projects that requires further investigation. It is important to have some transparency and understanding on the potential drivers of such over-spend such as poor forecasting, higher than expected input costs, planning and design errors or a combination of these.

On this basis, KPMG recommends that GAWB provide the QCA with further information to validate these variations. Where GAWB cannot justify these variations being outside of its control, the QCA may seek to adjust the capital expenditure that can be rolled into the RAB at the start of the 2020 regulatory period, to reflect the material overspend.

As a minimum, we advise that GAWB should try to maintain more careful documentation of capital delivery against budget, such that it can demonstrate the efficiency of its spend. There needs to be a strong link between estimates agreed during project planning and cost of delivery (noting variations that account for escalation, growth, contingency and a standard +/-10 per cent for accuracy) and a framework for evaluating the reasons for any material derivations.

Analysis of expenditure by driver identified that GAWB has significantly underspent on its originally planned replacement capex, while at the same time overspending on projects with regulatory and capacity cost drivers. This suggests replacement capex projects are able to be deferred in response to reallocating capital funds to high risk projects which emerge as a higher concern during a regulatory period.

On its own this suggests capital planning efficiency, and a good outcome. However, it does raise concerns that more effort may need to be applied to the asset management elements of GAWB's capex planning, and in particular:

- a focus on asset condition monitoring
- a better understanding of failure modes and frequency, and
- a more accurate estimate of replacement timing

to lower the overall average replacement capex in the future.

KPMG notes the 'stringy' and limited 'meshed' nature of the GAWB pipeline and reservoir assets and the difficulty of allowing a run-to-failure asset management strategy, which would likely increase outages to its large industrial customer base underlying the need for replacement to occur in a timely manner.

Sample project review

Of the three historical forecast projects reviewed, GAWB has demonstrated the prudency and efficiency of two projects (Offline storage and repump station and Awoonga Dam VFD replacement).

The other remaining project (Accommodation Project), was considered prudent and partially efficient, [redacted]

Our proposed adjustments are detailed in Table 1.

Table 1: KPMG proposed adjustments to GAWB's historical capex ($ million, nominal)

Project	Prudency	Efficiency	GAWB actual capex (inc IDC)	KPMG proposed capex (inc IDC)	Adjustment to capex
1. Offline storage and repump station	YES	YES	38.04	38.04	-
2. Accommodation Project	YES	NO	[redacted]	[redacted]	[redacted]
3. Awoonga Dam VFD replacement	YES	YES	6.66	6.66	-
TOTAL			[redacted]	[redacted]	[redacted]

As such, we recommend that the QCA adjust GAWB's historical capex down by [redacted] in relation to the identified issues [redacted]

Table 2: Adjusted capital expenditure 2015-20 (including IDC) ($ million, nominal)

	2020-21	2021-22	2022-23	2023-24	2024-25	Total
GAWB actual capex	**14.01**	**20.85**	**29.00**	**40.31**	**18.31**	**122.48**
Less						
Adjustment – sample project 2		[redacted]				[redacted]
Adjusted GAWB capex	**14.01**	[redacted]	**29.00**	**40.31**	**18.31**	[redacted]

Forecast capex (2020-25)

GAWB has proposed $178.7 million in capital expenditure for the period 2020-25.

To assess the prudency and efficiency of GAWB's forecast capex, KPMG:

- Completed a review of seven capex projects, that reflect 55% of the capital program, and include projects across different drivers, different services and across different years;
- Adjusted the proposed allowances for those sample projects, where evidence did not support the prudency and/or efficiency of the project; and
- Identified whether there were any systemic issues uncovered in the sample of projects reviewed, and the potential for any broader adjustments to be made to the non-sampled projects.

Of the seven forecast projects reviewed, GAWB has been able to demonstrate the prudency and efficiency of four projects:

- Awoonga Dam Spillway Capacity Upgrade Stages 2 & 3;
- South Gladstone Reservoir Replacement;
- Connection to GRC/Kirkwood Reservoir; and
- Gladstone Water Treatment Plant to South Gladstone Reservoir Stage 3.

Of the three remaining projects, none were able to demonstrate the prudency (i.e., the justification for an identified need) of the project, and hence all proposed costs are proposed to be removed, except small amounts for further planning. For these projects, we recommend a small allowance to continue the planning and appraisal processes.

Our proposed adjustments are detailed in the following table.

Table 3: KPMG proposed adjustments to sample projects ($ million, nominal)

Project	Prudency	Efficiency	GAWB proposed capex (inc IDC)	KPMG proposed capex (inc IDC)	Adjustment
4. AD Spillway Capacity Upgrade Stages 2 & 3	YES	YES	60.69	60.69	-
5. South Gladstone Reservoir Replacement	YES	YES	11.55	11.55	-
6. Connection to GRC/Kirkwood Reservoir	YES	YES	7.06	7.06	-
7. Expansion of Boat Creek Pumping Station	NO	YES	6.63	0.10	-6.53
8. Calliope River Bridge AC Main Replacement	NO	NO	4.31	0.20	-4.11
9. GWTP to South Gladstone Reservoir Stage 3	YES	YES	4.02	4.02	-
10. UV Disinfection	NO	YES	3.70	0.30	-3.40
TOTAL			**97.96**	**83.92**	**-14.04**

These adjustments take the capital expenditure forecast (including IDC) to $164.66 million, or a reduction of 8 per cent. This impacts the annual capitalised amounts as follows:

Table 4: Adjusted capital expenditure forecast (including IDC) ($ million, nominal)

	2020-21	2021-22	2022-23	2023-24	2024-25	Total
GAWB forecast	**35.64**	**25.78**	**15.62**	**9.73**	**91.97**	**178.75**
Less						
Adjustment – sample project 7	*0.1*				*-6.63*	*-6.53*
Adjustment – sample project 8	*0.2*	*-4.31*				*-4.11*
Adjustment – sample project 10				*-3.40*		*-3.40*
Adjusted GAWB forecast	**35.94**	**21.47**	**15.62**	**6.33**	**85.34**	**164.70**

During this review, KPMG uncovered a suite of issues that when addressed, would improve the prudency and efficiency of GAWB's capital forecasting. These are summarised below.

Deliverability

KPMG has concerns with GAWB's ability to deliver a replacement program that is almost double what it is forecast to deliver in the current period. In fact, GAWB is proposing to complete replacement works in the first two years of the next regulatory period, which is almost three times larger than the annual average completed in the current regulatory period. This raises concerns with the availability and ability for local contractors to support a trebling of work. If GAWB is required to look beyond the local market, it may have to pay a premium to bring contractors to Gladstone to complete the work.

KPMG also notes that the replacement capex is not particularly uniform across the regulatory period. A more stable replacement capex profile should assist local contractors to maintain efficient delivery

of services to GAWB and benefit the local community through continued presence in the regional economy.

KPMG recommends that GAWB provide to the QCA, detailed documentation of how it proposes to deliver its replacement program, prior to approving the works. This may include (for example) outcomes of market testing through an expression of interest. If GAWB cannot adequately demonstrate deliverability, the QCA may consider only approving a replacement program consistent with GAWB's current expenditure profile.

Project planning

In reviewing GAWB's forecast capex for 2020-2025, KPMG has recognised that the majority of the larger projects are only in the early concept or scoping phase of the Project Management Framework (PMF)[3]. For this reason the documentation available to support the project is limited, and the cost estimates are by definition within quite a large range. To assist future analysis of capex, GAWB should add two data fields to its capex project spreadsheet data base which display the PMF Risk Level and the Development Phase for each project. This would allow both GAWB and the QCA to assess what documentation from the PMF templates external advisers should be available to review in support of each capex project. This would also allow a more rigorous control of capex within GAWB's governance framework.

Interest during construction

GAWB has demonstrated that Interest during construction (IDC) was calculated using a robust method, by applying a post-tax real vanilla weighted average cost of capital (WACC) to forecast nominal expenditure. To do this, GAWB has determined an equivalent monthly real WACC, and applied this to the duration of months between construction commencement and commissioning.

Under our terms of reference with the QCA, KPMG was not required to assess the rigour of assumptions underpinning the WACC.

Escalation factors

Under the advice of Deloitte Access Economics (DAE)[4], GAWB has proposed a capex escalation of 2.8 per cent.

KPMG has concerns with GAWB's calculation of escalation for capex, such that it may be overstating the necessary escalation that should be applied. GAWB has used rates for labour and capital share that are based on construction sector averages, without correlating to its own data and situation. It has therefore not justified use of this data as a basis for forecasting.

Similarly, wages in the construction sector (average 1.83 per cent) have grown slower than the Queensland WPI (average 2.13 per cent) over the last five years, providing evidence that use of the Queensland WPI may overstate wages growth related to capex. We feel that GAWB has not provided sufficient reasoning to justify the application of this factor to its capex forecasts.

The PPI for Heavy and civil engineering construction has also seen moderate growth of 1.8 per cent over the last five years, and the CPI for Queensland of 1.64 per cent.

Noting this series of conflicting evidence against the proposed escalator, we recommend that the QCA adopt an average annual escalation for capex of 2.0% per annum for the 2020-25 regulatory period,

[3] The PMF defines four different project levels, projects are classified based on the outcomes of a risk classification assessment which includes evaluation of risks including health and safety, environmental, cost, reputation, technology and resources.

[4] https://www.qca.org.au/wp-content/uploads/2019/07/gawb-proposal-att-2-dae-cost-escalation-factors.pdf

based on KPMG's assessment of the best available forecasts for CPI growth. This is 0.82 per cent per annum lower than the rate of escalation proposed by GAWB over the same period.

Capex-opex trade-offs

KPMG has identified that GAWB is implementing capex opex trade-off techniques within the PMF process. Because of the project sample basis used for this regulatory review, it is unclear both in terms of whether this is undertaken in all new Business Cases and whether it is a central element of the PMF decision-making process.

KPMG would encourage GAWB to develop an NPV template to assist with early options analysis in the Concept phase of the PMF, whereby there is stronger justification for the selected option to carry forward into the Planning phase, and ultimately the project Business Case. More detailed NPV analysis is likely to be available as the costs for the selected option improve in accuracy, and be a feature of the Business Case itself, as was seen for the GWTP to South Gladstone Reservoir Stage 3 project. This would also help to highlight and evaluate potential capex-opex trade-offs.

Systemic issues

Of the sample forecast projects assessed, KPMG noted the following issues with GAWB's forecast capex which could demonstrated a potential systemic limitation with GAWB capex planning and forecasting techniques:

- The standard of works has commonly not been detailed. While this can be put down to the early stage of the planning process, it also indicates a lack of clear understanding of what technical requirements the solution will need to deliver, and hence a number of variations may be required to support successful delivery over the project life. KPMG recommends that GAWB more carefully consider the relevant standard of works to support its capital forecasting ;
- When deciding between refurbishing or maintaining an asset to extend its useful like or replacing it, GAWB commonly determines that replacement is appropriate, on the basis of risk reduction. While reducing risk of service reliability/compliance issues is a reasonable bases for investment, it should be supporting by for example declining asset condition, service performance or customer preferences learned through robust engagement. Asset utilisation should also be an important consideration.

  GAWB has not provided adequate evidence (in many cases) that there is asset performance or condition issues (now or in the near term) that warrant investment. KPMG recommends that GAWB be encouraged to undertake more condition assessment studies and to look for additional options through its decision processes in the scoping and planning phases of its project management framework, so that other approaches than just pure replacement are explored;
- GAWB commonly identified that a driver for investment was to maintain high reliability standards, driven by customer needs. For example, a common basis for investment was the understanding that customers were not willing to accept any risk of supply interruption, given the large commercial impacts. Noting these assertions, it did not provide adequate evidence that documented:
  - Discussions with effected customers and/or presentation of customer feedback that articulated these servicing needs and an appreciation of the cost trade-offs; and
  - Options and customer impacts were presented to customers that would allow them to present their willingness to pay for improved service levels.

KPMG recommends GAWB improve its customer engagement through scheduled discussions on capex options and the resulting bill impact of options on customers. Customers need to be aware of the tariff impacts they will become subject to over the next regulatory period, so that they can make

rational buy/build decisions. This is particularly relevant to supply buffering investments which may indeed be better handled by the large industrial customers, than necessarily being undertaken by GAWB.

Additional expenditure adjustments

Based on the overall assessment across GAWB capex and asset management processes including the systemic issues above, on balance we have not identified a strong rational to make reductions to the non-sample capex projects. Instead we suggest that GAWB implements our suggested improvements in these areas which will help to provide more transparency and rigour to the capex forecasting and governance processes in the future. We also note that GAWB has proposed to seek consultant advice on aspects of its asset management processes – we strongly support these investments, which will help GAWB address some of the suggested improvements identified in this review.

However we do recommend adjusting GAWB's forecast to account for a lower level of capital escalation due to our concerns on GAWB escalation methodology explained above.

Further, we also recommend that GAWB provide the QCA with further information on the proposed replacement program, to justify the significant increase in expenditure and the ability of the local market to support delivery of a significantly larger program of works. Pending further information, the QCA may consider adjusting down GAWB's proposed replacement program, where it cannot justify the ability (both internally and externally) to deliver a program that is 87 per cent higher than current expenditure.

Table 5: KPMG proposed GAWB capital expenditure forecast (including IDC) ($ million, nominal)

	2020-21	2021-22	2022-23	2023-24	2024-25	Total
GAWB forecast	**35.64**	**25.78**	**15.62**	**9.73**	**91.97**	**178.75**
Adjustment – sample project 7	*0.1*				*-6.63*	*-6.53*
Adjustment – sample project 8	*0.2*	*-4.31*				*-4.11*
Adjustment – sample project 10				*-3.40*		*-3.40*
Adjustment - escalation	*-0.86*	*-0.68*	*-0.57*	*-0.27*	*-4.13*	*-6.52*
Adjusted GAWB forecast	**35.08**	**20.79**	**15.05**	**6.06**	**81.21**	**158.19**

KPMG recommends an adjusted capital forecast (including IDC) of $158.19 million to be capitalised for the period 2020-25, which is 11 per cent lower than proposed.

1.3.4 Operating expenditure

Our analytical approach to assessing GAWB's opex included three key steps:

1. **Review of the previous expenditure review:** KPMG reviewed the QCA's past bulk water price investigations with particular reference to the last operating expenditure review undertaken by

Jacobs[5]. The purpose of this review was to identify any issues or actions recommended by Jacobs and the QCA and whether GAWB have subsequently sought to address over the course of the current regulatory period.

2. **Assessment of historical and forecast expenditure and forecasting method:** The next step was to review historical and forecast expenditure, seeking to understand drivers of deviations from previous forecasts and historic trends. Specifically, this involved:

   - Review of historical expenditure trends and how GAWB's actual expenditure tracked against previous forecasts.
   - Review of GAWB' forecasts against historical trends and assessment of rationale for deviations from trend, including assessment of forecasting method.
   - Review of GAWB's supporting documentation and processes supporting opex to assess whether this is reflective of good industry practice and proves adequate understanding of the forecasts.

3. **Further investigation of particular cost categories:** Based on findings in steps 1 and 2, KPMG carried out further evaluation of specific and material cost items to provide more detailed assessments of whether forecasts are prudent and efficient. This included a detailed review of forecasting methods (where provided) and supporting documentation to assess whether these are reflective of good industry practice and provides robust justifications for proposed expenditure. We note that GAWB has supplied additional information in response to some of KPMG's preliminary findings. Where possible, we have considered this information to arrive at our draft findings, but due to the late receipt of this information, we have not been able to consider it all in full. We highlight such instances in our analysis in chapter 7.

Comparisons of actual outcomes against historical forecasts

Based on the information provided, we noted that for each year of the current regulatory period from 2017-18, GAWB has delivered services at operating costs materially higher than that approved as efficient in the previous price investigation. While actual expenditure in 2015-16 and 2016-17 was consistent with that approved by the QCA in the previous decision, actual expenditure in 2017-18 and 2018-19 exceeded the allowance by approximately 17% and 12% respectively. We note that the budget for 2019-20 is also 25% greater than the level of operating expenditure approved by the QCA in the previous price determination.

An ex-post prudency and efficiency review of GAWB's operating expenditure over the 2015-20 regulatory period is outside of the scope of KPMG's assessment. However, for a number of cost items assessed as part of our review of GAWB's forecast operating expenditure, we needed to establish a reasonable baseline, particularly where forecasts were based on extrapolations of actual expenditure. In these cases, we formed a view based on historical expenditure and trends, and any additional information provided by GAWB to explain deviations from trends or significant cost increases. We also attempted benchmarking comparisons, but in most cases we did not find sufficient data that could be used for these purposes.

In the cases where we could not establish a reasonable baseline based on the information available to us, our recommended forecasts are based on alternative approaches to ensure costs approach efficient levels over time, such as applying a compound annual efficiency factor – this is explained further below.

[5] https://www.qca.org.au/wp-content/uploads/2019/05/28040_Jacobs-Final-Report-May-2015-1.pdf

GAWB's forecasting approach

While GAWB has provided an overview of its approach to forecasting, it has not provided much detail on its method. Based on our review of the forecasts we believe GAWB's method can be characterised as a hybrid method that incorporates elements of both a bottom up approach and a base-step-trend approach. Examining General Ledger (GL) level data shows that a number of forecasts are steady state extrapolations of a base year, while other cost items have profiles that vary over time consistent with a bottom up approach. Such a hybrid approach is reasonable where individual expenditure streams would be expected to vary significantly over time.

In particular, we found that GAWB:

1) Developed base line forecasts in real $2018-19 terms, based either on a bottom-up approach or extrapolation of a base year.
2) Applied Deloitte Access Economics (DAE) nominal escalators to convert the forecasts from $2018-19 to nominal values.

In order to adapt our assessment method to the forecasting approach used by GAWB and the information provided, we focused our assessment on the following three questions:

1) Are there significant changes in proposed costs where our assessment could not establish these as being prudent or efficient?
2) Is GAWB's application of cost escalators reasonable?
3) What is the potential for GAWB to achieve efficiency improvements in operational expenditure?

Cost escalators

GAWB has applied separate cost escalation factors for different opex cost categories ranging from electricity to chemicals and insurance. The escalation factors used were prepared by DAE and draws on its macroeconomic forecasts for the Queensland economy, in particular the forecasts for the Consumer Price Index and Wage Price Index.

We found that GAWB had applied DAE's suggested escalators incorrectly. For example, while DAE's escalation factors were calculated from 2020-21 onward, GAWB used them to convert values from $2018-19 as opposed to from $2019-20. We found that DAE's escalators were generally above the equivalent escalation factors that would apply to convert $2018-19 to $2019-20, and therefore GAWB's nominal forecasts in all years have been artificially inflated.

We have reviewed DAE's suggested escalators and have for some costs recommended alternative escalators. We have also updated all escalators to be based on our assessment of the best data available. Furthermore, rather than applying a single average escalation factor for the whole period, we have applied the relevant annual escalator in each year. This is discussed further in section 6.4.1.

Efficiency factor

GAWB has proposed a static efficiency adjustment of 1% to its controllable operating and maintenance expenditure. GAWB's proposed efficiency factor is not compounding in nature. GAWB applies the target separately to its forecasts on a per annum basis, consequently the target and its associated efficiency is only netted off the base expenditure for the year in which it is applied meaning that the efficiency saving for any one year reflects the target for that year and does not include the impact of the preceding years target.

This proposed application approach is not common. In other jurisdictions, such as Victoria, compounding efficiency targets is established practice. This means that the efficiency saving in any

one year will reflect both the savings for that year and the ongoing savings resulting from efficiencies achieved in previous years. Compounding efficiency rates are analogous to the manner in which financial institutions apply compounding interest earnings to savings. Compounding rates allow for non-linear positive escalations of cost (for costs to increase at an increasing rate over time) and for non-linear negative escalations of costs (for costs to decrease at a decreasing rate over time). Effectively efficiency improvements achieved in any year are lock in for the future.

Compounding rates for efficiency gains are more consistent with the concept of ongoing or continuing efficiency than the static approach adopted by GAWB.

We note that GAWB's proposed static 1% per annum efficiency gain is:

a) inconsistent with the compounding application used by other regulators; and

b) towards the lower end of those factors both set by other regulators and proposed by the Victorian water businesses in the recent regulatory reset.

Our advice is that a higher efficiency factor should be applied to GAWB and for that factor to be applied on a compounding basis. This will further help to ensure that the proposed expenditure reflect efficient and prudent costs over the next five years. Our reasons are:

- A significant proportion of the actual opex incurred during the current period by GAWB and proposed for the period is aimed at systems improvement and new initiatives. The objective of such expenditure is to improve the quality and efficiency of GAWB delivery of its services, rather than as a response to new obligations or growth. A higher efficiency factor will provide a strong incentive on GAWB to ensure that such expenditure meets its objectives and delivers additional value for its customers.
- Any efficiency factor applied to GAWB could reflect an element of both catch up and continuous efficiency.[6]
- A higher compounding factor is consistent with practices of other regulators and what has been both proposed and achieved by water business in similar circumstances to GAWB.

Under these circumstances we believe there is a strong case for the adoption of a higher efficiency target for this next period. We recommend the QCA adopt an efficiency factor of 1.8% compounded annually, consistent with the average proposed in the 2018 PREMO review and also within the range applied by regulators for water businesses in the past. We have applied this efficiency factor to most controllable opex categories, except where noted otherwise in Chapter 6.

KPMG's recommended opex profile

On the basis of our prudency and efficiency review of GAWB's proposed opex forecasts, KPMG is recommending the QCA adopt the opex forecast shown in Table 7. In Table 8, we show how our recommended opex forecast compares with GAWB's proposal. It should be noted that GAWB's proposed opex forecast in Table 8 differ somewhat from the forecast in its written proposal to the QCA. The difference is due to some opex figures associated with QCA requirements being excluded from its written proposal. In our analysis, we have included all opex costs, as per the opex data GAWB provided to us.

[6] Catch-up efficiency refers to the efficiency improvement needed for the business to catch-up to the production frontier, and is often applied to the first year of the regulatory period. Continuous efficiency refers to the expectation that the frontier itself will be continually moving as a result of ongoing innovations and cost savings due to technological change. Continuous efficiency is typically applied on a per annum basis, meaning it is compounding in nature. Efficiency factors are discussed in more detail in Appendix A.

Table 6: KPMG recommended opex ($ nominal)

	2020-21	2021-22	2022-23	2023-24	2024-25
Operations	2,106,435	2,172,159	2,228,396	2,289,901	2,340,656
Maintenance	3,151,713	3,265,592	3,367,051	3,539,023	3,554,335
Electricity	2,473,668	2,400,634	2,400,634	2,400,634	2,400,634
Chemicals	695,467	709,306	725,691	741,584	757,825
Employment costs	12,940,634	13,319,204	13,822,598	14,144,939	14,676,887
Rates	506,321	519,538	534,788	549,385	564,328
Insurance	1,436,574	1,403,298	1,483,426	1,652,588	1,653,909
Information systems	3,242,546	2,813,787	2,946,380	3,123,684	3,030,746
Professional services	3,092,443	2,612,226	2,675,332	3,066,495	4,485,461
Administration	1,579,812	1,561,161	1,602,010	1,669,905	1,668,922
Total recommended opex before efficiencies	**31,225,613**	**30,776,906**	**31,786,306**	**33,178,139**	**35,133,703**
Efficiency adjustment	*(441,898)*	*(875,842)*	*(1,301,975)*	*(1,720,437)*	*(2,131,367)*
KPMG recommended opex (including efficiency)	**30,783,715**	**29,901,064**	**30,484,331**	**31,457,702**	**33,002,335**

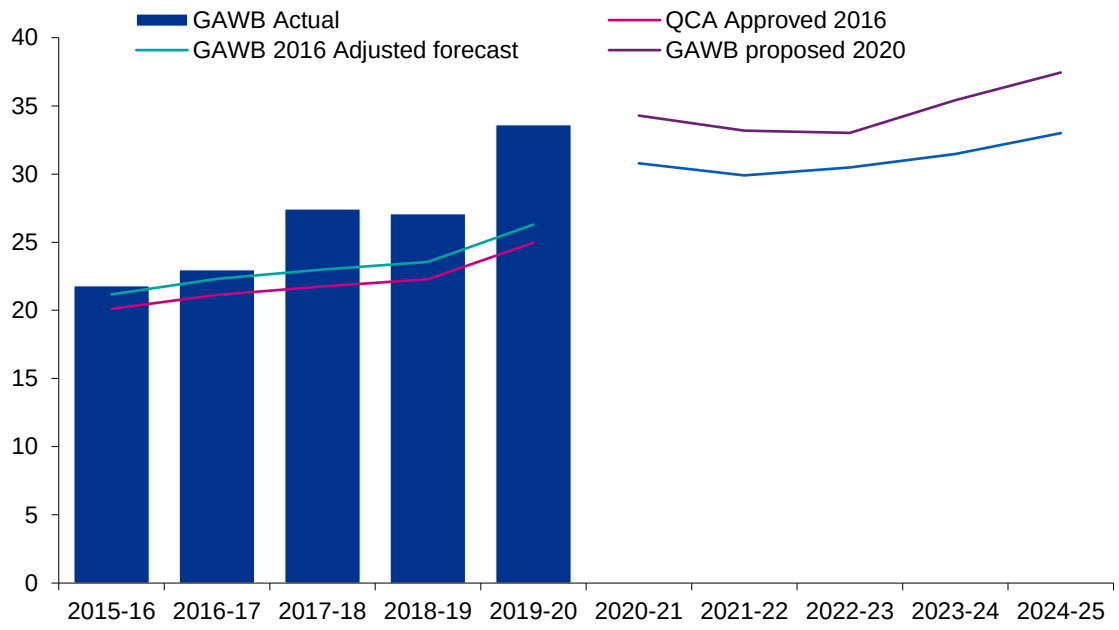
Table 7: Difference between proposed expenditure and KPMG recommendations ($ nominal)

	2020-21	2021-22	2022-23	2023-24	2024-25
GAWB proposed (including efficiency)[a]	**34,288,804**	**33,187,933**	**33,017,707**	**35,411,563**	**37,445,170**
KPMG functional adjustments	*(3,291,759)*	*(2,666,244)*	*(1,466,536)*	*(2,475,605)*	*(2,557,841)*
KPMG additional efficiency adjustments	*(213,330)*	*(620,625)*	*(1,066,840)*	*(1,478,257)*	*(1,884,994)*
KPMG recommended opex (including efficiency)	**30,783,715**	**29,901,064**	**30,484,331**	**31,457,702**	**33,002,335**
Annual difference	*(3,505,089)*	*(3,286,869)*	*(2,533,376)*	*(3,953,861)*	*(4,442,835)*
NPV of difference	**($14,810,834)**				

a *The efficiency savings included in GAWB's proposed opex figures are KPMG estimates based on the opex forecast data provided by GAWB, and GAWB's proposed efficiency target. The saving are slightly overstated as we did not have the level of data granularity necessary to identify uncontrollable expenses associated with water treatment plant operators. This also means that our estimated proposed opex is slightly lower than GAWB's actual proposal.*
Note: *NPV calculations based on a 6% discount rate*

Figure 3 provides a comparison of GAWB's allowed and actual opex in the current period, along with GAWB's proposed and KPMG's recommended for the upcoming period.

Figure 3: GAWB's operating expenditure 2016-25 ($ million, nominal)



Source: GAWB and KPMG Analysis

We also make the following recommendations:

- Prior to the next price review, GAWB should develop and implement a base-step-trend (BST) method for forecasting operating expenditure. BST represents regulatory best practice and will provide a more structured, and simplified basis for GAWB to both develop its forecasts and for the QCA to undertake its regulatory assessment of those forecasts. A BST method is also consistent with the Queensland Governments requirements of materiality that have been applied to the regulatory framework.

- Prior to the next price review, GAWB should develop a detailed information template that can be used by GAWB to submit the financial data accompanying its pricing proposal. Information templates represent regulatory best practice and are an integral part of the price review process undertaken by IPART in NSW and the ESC in Victoria. The use of an information template provides guidance to GAWB by explicitly setting out the data required by the QCA to undertake its review. Information templates will minimise the extent to which the QCA has to issue formal requests for information following the submission of the pricing proposal, subsequently reducing the regulatory burden placed on both the QCA and GAWB. The information templates developed by IPART and the ESC incorporate a fully functioning building block model that captures all opex, capex, tariff and demand data requirements that would be necessary for the QCA to make an informed regulatory decision.

- That GAWB should make improvements to reporting and assessment of IT projects over the next period in order to provide a better sample of materials to review the expenditure at the end of the period. This should also include post implementation assessments on benefit realisation.

1.3.5 Other areas of improvement

We recommend that GAWB:

- ensure that customers are engaged on an ongoing basis to provide more focus on what is important to customers over the course of the regulatory period and to provide a better understanding of customer requirements prior to the review
- ensure that its consultation draws a clearer link between proposed expenditure and both prices and service level outcomes for customers.

1.4 Summary of recommended expenditure 2020-25

Table 9 summarises KPMG's recommended operating and capital expenditure for GAWB over the 2020-25 regulatory period.

Table 8: KPMG recommended operating and captial expenditure ($ million, nominal)

	2020-21	2021-22	2022-23	2023-24	2024-25	Total
Operating expenditure	**35.08**	**20.79**	**15.05**	**6.06**	**81.21**	**158.19**
Capital Expenditure	**30.78**	**29.90**	**30.48**	**31.46**	**33.00**	**155.63**

Contents

2 Introduction

2.1 Gladstone Area Water Board

Gladstone Area Water Board (GAWB) was established in 1973 as a Project Board under the State and Regional Planning and Development, Public Works Organisation and Environmental Control Act 1971–73. On 1 October 2000, GAWB commenced operations as a Category 1 Water Authority under the *Water Act 2000* (Qld) and on 1 July 2008, GAWB became a registered service provider under the *Water Supply (Safety and Reliability) Act 2008* (Qld).

GAWB owns and operates Awoonga Dam on the Boyne River, along with a network of delivery pipelines, water treatment plants and other bulk water distribution infrastructure.

2.2 Our objectives and scope

GAWB's forecast operating and capital expenditure, which contribute to the total costs recovered via prices, represents a key component in the QCA's price investigation.

The objective of KPMG's assessment is to provide advice and guidance to assist the QCA with determining the prudency and efficiency of GAWB's operating and capital expenditure. Specifically, KPMG was required to assess the following:

- GAWB's governance, policies and procedures relevant to operating and capital expenditure decisions;
- The reasonableness of GAWB's opex and capex forecasting methodologies and their application, including inputs, assumptions and modelling. This includes providing recommendations on:
    a) the prudency and efficiency of actual opex and capex incurred in the current regulatory period (based on a sample of actual opex and capex), and the drivers of any forecast divergence from historical trends
    b) the prudency and efficiency of GAWB's forecast capex program taking into account the uncertainty around projects at an early stage of development, and suitable approaches for dealing with risk and uncertainty
    c) the suitability of GAWB's proposed base year for establishing an efficient level of recurring opex, and if not suitable, an alternative base year
    d) the prudency and efficiency of proposed base year, including any adjustments required to account for non-recurrent costs and identified efficiencies
    e) the prudency and efficiency of any proposed incremental step changes to base-year opex, including whether the drivers of those steps changes are reasonable
    f) the reasonableness of proposed trends applied to base year including, but not limited to, cost escalation methodologies
    g) the reasonableness of proposed escalation rates applied to forecast capex outlays
    h) the reasonableness of the allocation of indirect and overhead costs to segments of GAWB's business
    i) the potential for efficiency gains, supported by appropriate justification

j) the nature and value of any opex assessed as not prudent or efficient

k) the nature and value of any proposed renewals expenditure assessed as not prudent of efficient

l) the delivery of GAWB's proposed capex and opex programs.

- Whether GAWB has given appropriate consideration to substitution opportunities between opex and capex; and
- The appropriateness of GAWB's proposed escalation methods and rates, as applied to individual cost categories.

2.3 Our approach

To support the QCA with its investigation, KPMG has approached this task through the steps identified below. Where relevant, KPMG has drawn on regulatory precedent (set by the QCA and other jurisdictional regulators across Australia) in relation to key aspects of GAWB's forecast.

The steps completed by KPMG include:

1 **Review of governance and planning frameworks**: KPMG completed a desktop review of GAWB's supporting policies and procedures detailing its overarching governance and planning frameworks. KPMG then sought to test the application of GAWB's supporting governance and planning frameworks in development of its capex and opex proposals to the QCA.

The strategic direction underpinning the development of opex and capex forecast are best captured in the governance and planning frameworks adopted by the business. These frameworks should provide detail on how an organisation aims to achieve its strategic objectives and manage its key risks.

2 **Review of capital expenditure:** KPMG completed its review of GAWB's historical and forecast capex in three stages, first at a portfolio level, second at a project level, and the third stage was to identify systemic issues, based on the project reviews.

At a project level, KPMG has completed detailed reviews of three historical and seven proposed major projects ranging in size from $4 million to $61 million. These projects are driven by growth, compliance, renewals and service improvements or a combination of these factors.

3 **Review of operating expenditure**: Evaluated the prudency and efficiency of GAWB's forecast operating expenditure to address the QCA's scope. For similar expenditure reviews, KPMG has employed a base-step-trend approach. This approach establishes an efficient base year, rolls forward the efficient base operating expenditure to take account of scale growth, input price growth and efficiency improvements plus any adjustments for material step changes to costs. The data and information provided by GAWB was not in a suitable format or at a sufficient granular for KPMG to apply this approach.

In performing each of the above steps, KPMG has:

- Completed a desktop assessment of capex and opex supporting documentation as provided by GAWB. This documentation has included, but not been limited to, asset management plans, corporate strategic and operational plans, risk management and compliance policies, individual capex project business cases, asset portfolio master plan (APMP), asset lifecycle management plans and independent third party reports (e.g. Deloitte's cost escalation factors).

- Held face to face meetings with key staff responsible for the formation of GAWB's forecast capex and opex. These meetings were held over the period 28 and 29th of October and included staff from the following business areas (not exhaustive): finance, long term
- Sought clarifications in the form of a secondary information request.

2.3.1 Defining prudency and efficiency

We have adopted the following definitions of prudency and efficiency of expenditure in accordance with those set out by the QCA in the terms of reference.

Operating expenditure is considered:

- Prudent if it can be justified by reference to an identified need or cost driver, e.g. to meet legal or regulatory obligations or contracts with external agencies; and
- Efficient if it minimises GAWB's long-run costs of providing bulk water supply services.

While capital expenditure is considered:

- Prudent if it can be justified by reference to an identified need or cost driver, e.g. to meet legal or regulatory obligations, new growth, renewal of existing infrastructure or an increase in the reliability or quality of supply explicitly endorsed or desired by customers, external agencies or participating councils; and
- Efficient if it is the least cost to deliver on an appropriately defined scope and standard of works. Efficient capex would typically encompass the scope (i.e. whether the general characteristics of the project provide the best means of achieving the desired outcomes), standard (e.g. whether the works conform to technical, design and construction requirements in legislation, industry and other standards, codes and manuals) and cost of the works.

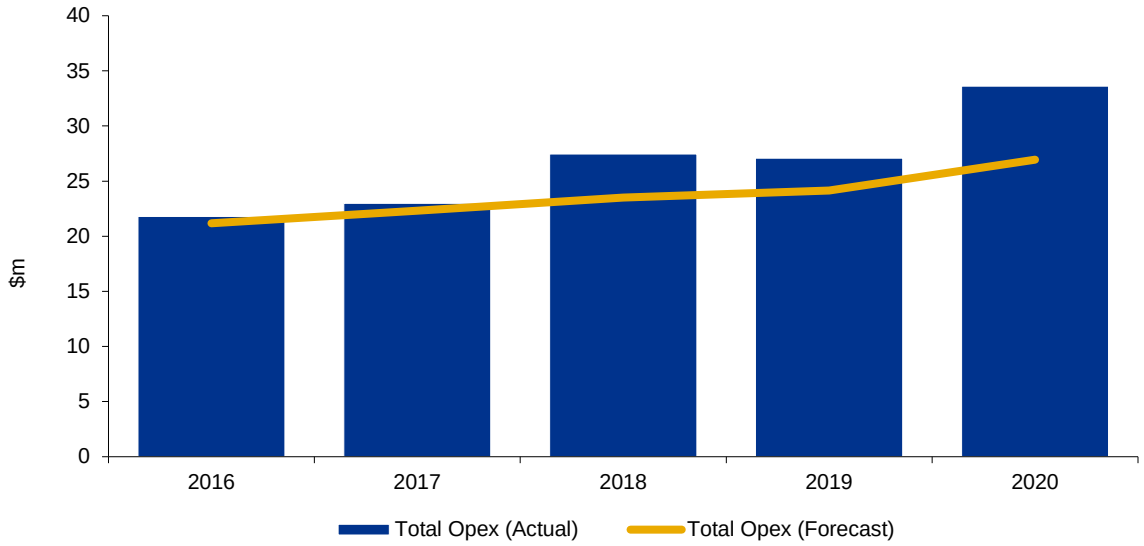
2.4 Summary of GAWB's proposal

The following sections provide a brief overview of GAWB's opex and capex for the current and upcoming period.

2.4.1 GAWB's Opex 2016- 20

Compared to the forecast levels of operating expenditure assumed for pricing purposes, GAWB's cost base has increased over the current pricing period. The areas where a material increase has occurred is in the areas of information systems (e.g. IT), professional services, and staffing costs.

Figure 4: GAWB's operating expenditure 2016-20 ($ million, nominal)

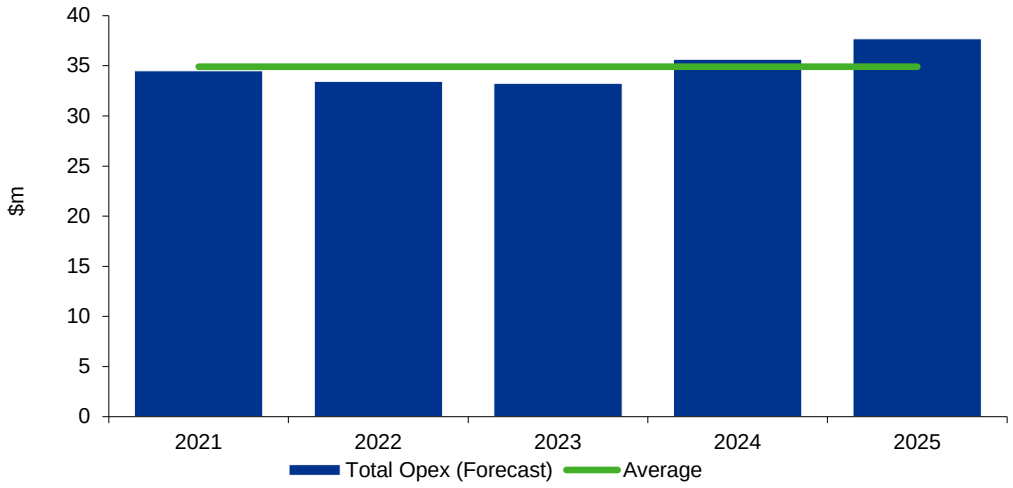


Source: GAWB and KPMG analysis

2.4.2 GAWB's proposed opex 2021-25

Forecast expenditure for professional services, staffing costs and information systems over the 2021-25 period, when compared to 2016-20 forecast levels, represent a material increase. GAWB states that these increases are an extension of those observed during the current pricing period. Over the 2021-25 review period, maintenance costs will increase materially, compared to current actual forecast levels. GAWB states that this increase is attributable to the timing of long-term major condition assessments and the age profile of the delivery network. GAWB noted that this cost base is necessary, in order to respond to GAWB's changing environment (e.g. increased use of technology, compliance and reporting obligations) and can be expected to deliver benefits to its customers in the longer term.

Figure 5: GAWB's proposed operating expenditure 2021-2025 ($ million, nominal)

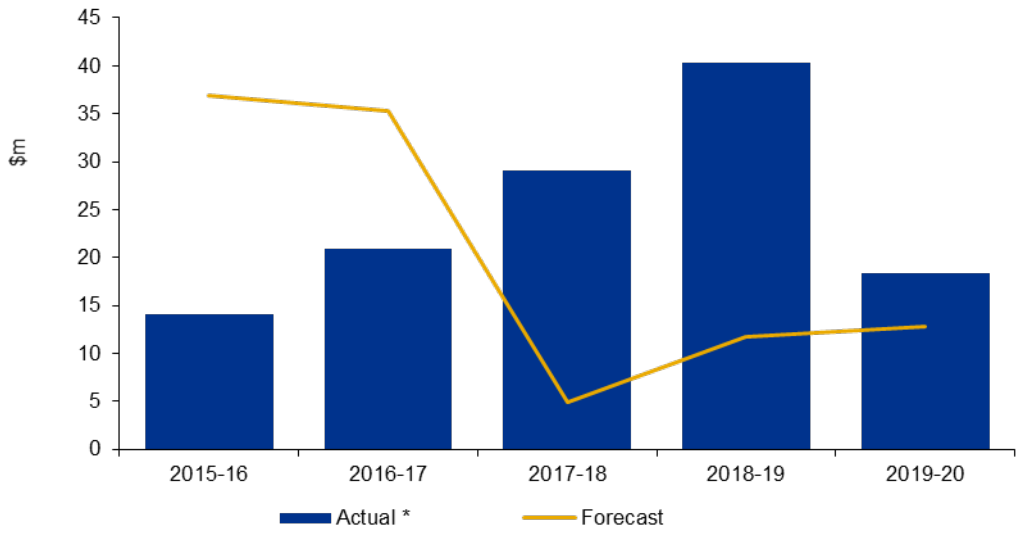


Source: GAWB and KPMG analysis

2.4.3 GAWB's Capex 2016-20

GAWB expects to capitalise over $122 million of project costs for the 2016-20 pricing period. This value includes expenditure forecast to be capitalised during the 2019-20 period and IDC. GAWB noted that consistent with the methodology accepted by the QCA in 2015, IDC has been applied to projects with a value greater than one million dollars. This has resulted in an additional $20.95 million being capitalised over this period, compared to forecast.

Figure 6: GAWB's capital expenditure 2016-20 ($ million, nominal)



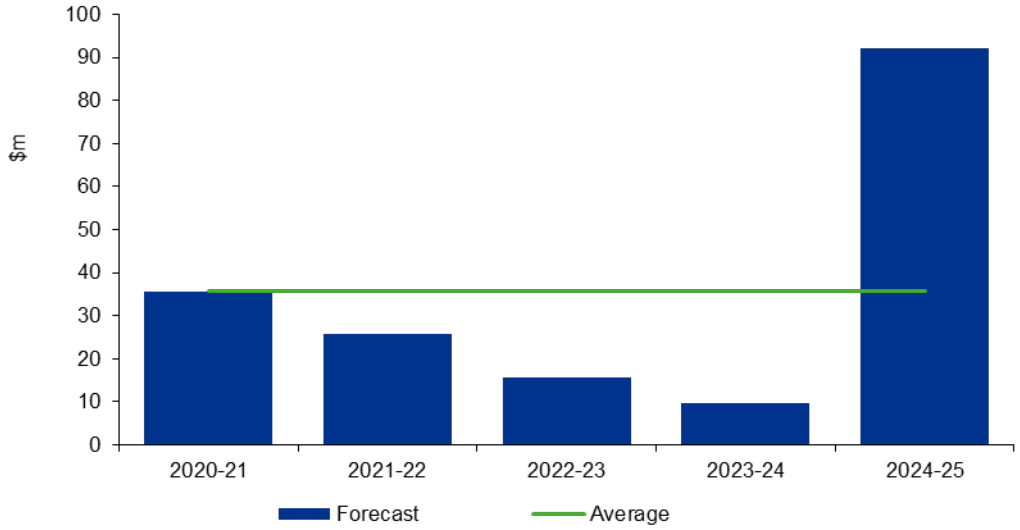
*Source: GAWB and KPMG analysis, *Forecast for 2019-20*

GAWB noted that over the 2016-20 period, it has delivered a capital program that includes several significant business process improvement and risk mitigation projects. An example is the construction of the Offline Water Storage Facility, which is an independent supply of water that provides between 10 and 14 days' supply (depending on customer consumption). Additional costs were incurred by GAWB during construction of the facility. These additional costs related to access issues, such as the requirement to upgrade the Gladstone/Benaraby and Skyring Hill Road intersection and to relocate essential infrastructure services, that weren't evident at the initial planning stages of the project.

2.4.4 GAWB's proposed Capex 2020-2025

GAWB has proposed capital expenditure of $178.75 million for the 2021-25 pricing period. GAWB noted that most of this expenditure will be to replace ageing assets and to address regulatory or compliance obligations. These include dam safety upgrades, recreation strategy and construction of a new hatchery.

Figure 7: GAWB's proposed capital expenditure 2021-25 ($ million, nominal)



Source: GAWB and KPMG analysis

2.5 Structure of the report

The remainder of this report is structured as follows:

Section 2: Review methodology and assumptions

Section 3: Asset management and capital planning

Section 4: Corporate Governance and Procurement

Section 5: Capital expenditure

Section 6: Operating expenditure

Section 7: Other areas of improvement

3 Review methodology and assumptions

In this section, KPMG provide further detail in relation to the methodology applied in completing each of the three steps to our assessment as well as the key assumptions made when reviewing material provided by GAWB.

3.1 Governance and planning frameworks

GAWB is an asset management organisation which means its objectives include coordinating activities to realise customer value from its asset base. To properly assess the asset management and capital planning processes of this type of organisation, we have utilised the International Standard, ISO55001 which requires a management system approach to asset management. Where business functions are not sufficiently covered by ISO55001, associated and referenced documents have been used such as the Asset Management Landscape that covers the globally agreed 39 subjects of asset management.

3.2 Capital expenditure

We have identified a number of tests that we have applied to each sample project. These include:

For prudency:

- *Driver* - Has GAWB demonstrated reasonable drivers for the expenditure?
- *Timing* – Is the timing of expenditure justified?
- *Documentation* – Does GAWB have appropriate justification for the expenditure?

For efficiency:

- Scope of works
  - *Options analysis* - Has GAWB demonstrated the selection of the optimal solution?
  - *Governance* – Can GAWB demonstrate that the project/program has been through its capital planning and governance framework? [7]
- Standard of works
  - *Standards – Does the technical solution meet the relevant standards and obligations?*
- Cost of work
  - *Estimate* – Has GAWB justified the cost estimates used to underpin the proposal?
  - *Method* – Can GAWB demonstrate an appropriate forecasting method?
  - *Customer* - Has the proposed option considered the impacts on customers?
  - *Opex* – Has GAWB appropriately considered capex-opex trade-offs for meeting the investment need?

We have used the above framework to guide our assessment of each project. Our initial draft analysis of the historical and forecast sample projects was presented to GAWB so that they could respond with additional information and clarifications.

[7] As described in GAWB's Project Management Framework (PMF, RFI0009 & RFI 0074, noting that flowchart PM043 for Level 2 & 3 detail is absent).

Further, we have also sought to assess, at a program wide level, whether there are any systemic issues with regard to how GAWB has completed its capital forecasting. These systemic issues are determined by assessing whether GAWB has appropriately implemented its capital planning and asset management framework for the selection of projects reviewed, and whether there are any consistent shortfalls in meeting the expectations for prudency and efficiency. Where there is a shortfall, we have sought to make an adjustment to the remaining program of works.

When assessing the prudency and efficiency of individual projects, we have applied the following review process to those projects with significant forecast expenditure in the next regulatory period:

- For historical projects which the QCA has previously accepted as prudent for the 2015-20 regulatory period, the focus is on the efficiency of delivery, unless the project scope has expanded significantly from that subject to the prior review where additional consideration might be warranted.
- If a project is not demonstrated to be prudent, then:
  - For projects delivered during the current regulatory period (2015-20) but not previously subject to a prudency review, these projects should not be rolled into the RAB; and
  - For projects proposed to be delivered during the next regulatory period (2020-25), these projects be excluded from the capital program used to set the RAB.
- where a project is at an early stage in the investment governance process (that is, within Gates 0-2 of the PMF) and, while considered to be prudent:
  - there is insufficient supporting information to clearly demonstrate the efficiency of the project, we have recommended exclusion of that project from the proposed capital program; and
  - there is sufficient information to demonstrate the efficiency of the project, however that information could be improved, we have adjusted the forecast to one that better reflects the efficient costs of the project/program, given the current level of information provided.
- where a project is determined to be both prudent and efficient (i.e. the supporting documentation demonstrates the scope, standard and cost of works), it is appropriate that this expenditure be considered in determining pricing for the regulatory period (2020-25).

3.3 Operating expenditure

For similar expenditure reviews, KPMG has employed a base-step-trend approach. The base-step-trend approach is well established for assessing operating expenditure forecasts. This approach establishes an efficient base year, rolls forward the efficient base operating expenditure to take account of scale growth (in this case growth in the volume of water delivered), input price growth and efficiency improvements and includes adjustments for step changes to costs. The data and information provided by GAWB was not in a suitable format or at a sufficient granular level to support the application of such an approach. Therefore we have adapted our approach to address the QCA's scope.

There are three key steps to our assessment of GAWB's operating expenditure:

1. **Review of the previous expenditure review:** KPMG commenced its assessment by first reviewing the QCA's past bulk water price investigations with particular reference to the last operating expenditure review undertaken by Jacobs. The purpose of this review was to identify any issues or actions recommended by Jacobs and the QCA, which GAWB have subsequently sought to address over the course of the current regulatory period.
2. **Assessment of historical and forecast expenditure and forecasting method:** The next step was for KPMG to review historical and forecast expenditure, seeking to understand drivers of deviations from previous forecasts and historic trends. Specifically, this involved:

- Review of historical expenditure trends and how GAWB's actual expenditure tracked against previous forecasts.
- Review of GAWB' forecasts against historical trends and assessment of rationale for deviations from trend, including assessment of forecasting method.

3. **Further investigation of particular cost categories:** Based on findings in steps 1 and 2, KPMG carried out further evaluation of specific and material cost items to provide more detailed assessments of whether forecasts are prudent and efficient. This included a detailed review of forecasting methods (where provided) and supporting documentation to assess whether these are reflective of good industry practice and provides robust justifications for proposed expenditure.

3.4 Meetings with GAWB

KPMG completed initial interviews with GAWB staff held over two days – 28th and 29th October 2019. During this time, KPMG met with key areas of GAWB's business responsible for development of the capital and operating expenditure forecasts.

In addition to these meetings, KPMG has had numerous teleconference discussions with members of GAWB's regulatory and pricing team. These discussions sought to further clarify information provided by GAWB's and identify potential information gaps.

3.5 GAWB's legislative Requirements

How GAWB both plans and operates its portfolio of assets ensuring the security, reliability and quality of water supply is governed by a range of legislative and regulatory instruments. These instruments include, but are not limited to:

- Water Act 2000;
- Water Supply (Safety and Reliability) Act 2008 (WSSR Act);
- Financial Accountability Act 2009;
- Environmental Protection Act (1994);
- Aboriginal Cultural Heritage Act 2003;
- Work Health and Safety Act 2011;
- Financial and Performance Management Standard 2009; and
- Australian Drinking Water Guidelines.

These instruments and regulatory requirements result in a number of obligations which include:

- *Dam Safety:* to make sure the Awoonga Dam does not pose unacceptable risks to downstream communities. This involves following safety processes, understanding flood capacity, preparing for and following the Emergency Action Plan[8]
- *Notifications:* there are a number of residential properties situated in close proximity to the dam. GAWB provides residents that may be potentially affected by floodwaters, with regular updates on dam levels, hourly inflows and evacuation routes.

[8] *Water Supply (Safety and Reliability) Act 2008* (Queensland).

- *Noxious weeds and pests*: as a significant landholder in the region, GAWB must meet its obligations for controlling noxious weeds and pests on this land and undertake general catchment management activities.
- *Environmental obligations:* GAWB has extensive obligations that relate to ensuring that the daily operations and investment activities do not harm the environment and actively support upstream freshwater ecosystem viability.
- *Water quality*: GAWB monitors water quality for various purposes, including environmentally relevant activities, the Awoonga Water Supply Scheme Resource Operations Licence (Awoonga ROL) and to maintain compliance with GAWB's Drinking Water Quality Management Plan (DWQMP).

Further, as a commercialised statutory authority responsible to the Minister for Energy and Water Supply GAWB is required to take into account a number of Government Policies in relation to its operation including Queensland Procurement Policy 2019[9] and Queensland Government Cloud Computing Strategy.[10]

[9] https://www.hpw.qld.gov.au/__data/assets/pdf_file/0020/3377/qldprocurementpolicy.pdf
[10] https://www.qgcio.qld.gov.au/__data/assets/pdf_file/0014/4712/170280-cc-strategy-v2.pdf

4 Asset Management and capital planning

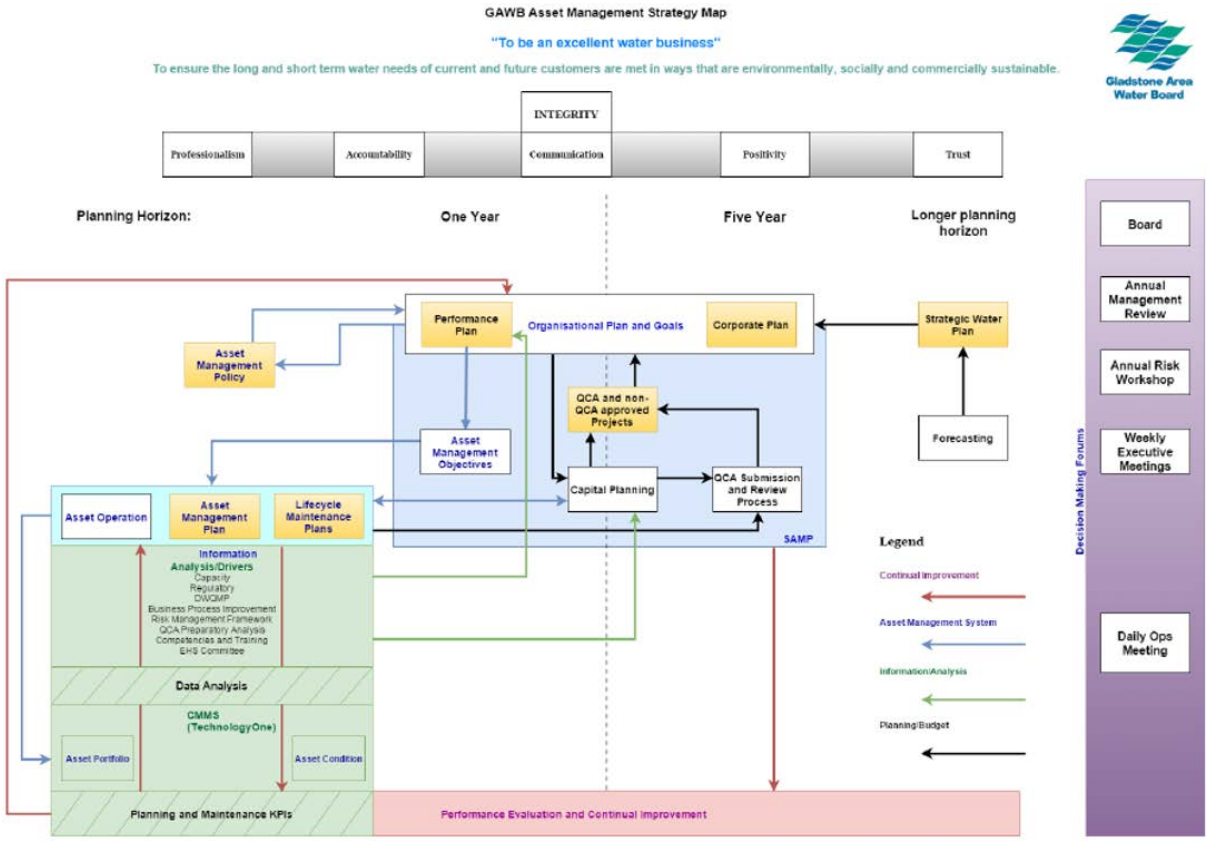
4.1 Overview of GAWB's asset management framework

ISO55001 "Asset management – Management systems- Requirements" is an international asset management standard which specifies requirements for asset intensive organisations to implement better asset management practices. GAWB have demonstrated a commitment to continuous improvement of their asset management system and alignment with leading practice frameworks, this is evident in their successful certification against ISO55001 and the delivery of a number of asset management improvement initiatives including:

- Revision of the Asset Management Strategy;
- Development of an Asset Management Improvement Plan;
- Development of Lifecycle Management Plans; and
- Identification of criticality at an asset class level.

GAWB's overarching asset management framework is depicted visually in the Asset Management Strategy Map located in the Asset Management Strategy.

Figure 8: GAWB Asset Management Strategy Map



4.2 Asset management policy

The purpose of the Asset Management Policy is to outline principles and mandated requirements, derived from and consistent with GAWB's broader organisational objectives, providing a basis for the development and implementation of the Asset Management System and the setting of asset management objectives.

The Asset Management Policy defines the overall mandated requirements and guiding principles that must be adhered to in undertaking all asset management activities involved in the lifecycle management of physical assets. It provides consistency and transparency in decision making and action.

The asset management policy should:

- Align with GAWB's strategic plan and other policies;
- State the principles that must be adhered to by all concerned;
- State how the policy will be implemented, roles and responsibilities;
- Be communicated to all employees, service providers and stakeholders; and
- Be endorsed by the top management within GAWB.

GAWB have implemented a documented Asset Management Policy and the Policy is endorsed by the Chief Executive Officer demonstrating senior leadership's commitment to asset management practices. The policy specifies principles for the management of the organisation's asset management system and the organisation's asset management objectives as follows:

- Consider intergenerational equity principles;
- Identify and consult with relevant stakeholders to understand their needs and expectations;
- Consider the balance of lifecycle cost, risk and performance; and
- Consider asset and non-asset solutions.

4.3 Strategic Asset Management Plan

The Asset Management Strategy is a key Asset Management artefact which details how Asset Management objectives will be achieved by the organisation. The Strategy should document the role of the assets, asset management and the asset management system in supporting achievement of the organisational objectives.

GAWB's Asset Management Strategy was developed in 2013 and represents a significant improvement on the previous asset management strategy. The Asset Management Strategy, in conjunction with the Asset Management Plan and Asset Management Improvement Plan, details how GAWB is implementing a risk-based asset management approach.

The Asset Management Strategy details:

- GAWB's operating context;
- The scope of the asset management system;
- The overarching strategic planning processes;
- The overarching Asset Management Framework and key asset management artefacts;

- A description of the Asset Management Information System;
- GAWB's approach to performance and evaluation and continuous improvement; and
- The role of decision-making forums.

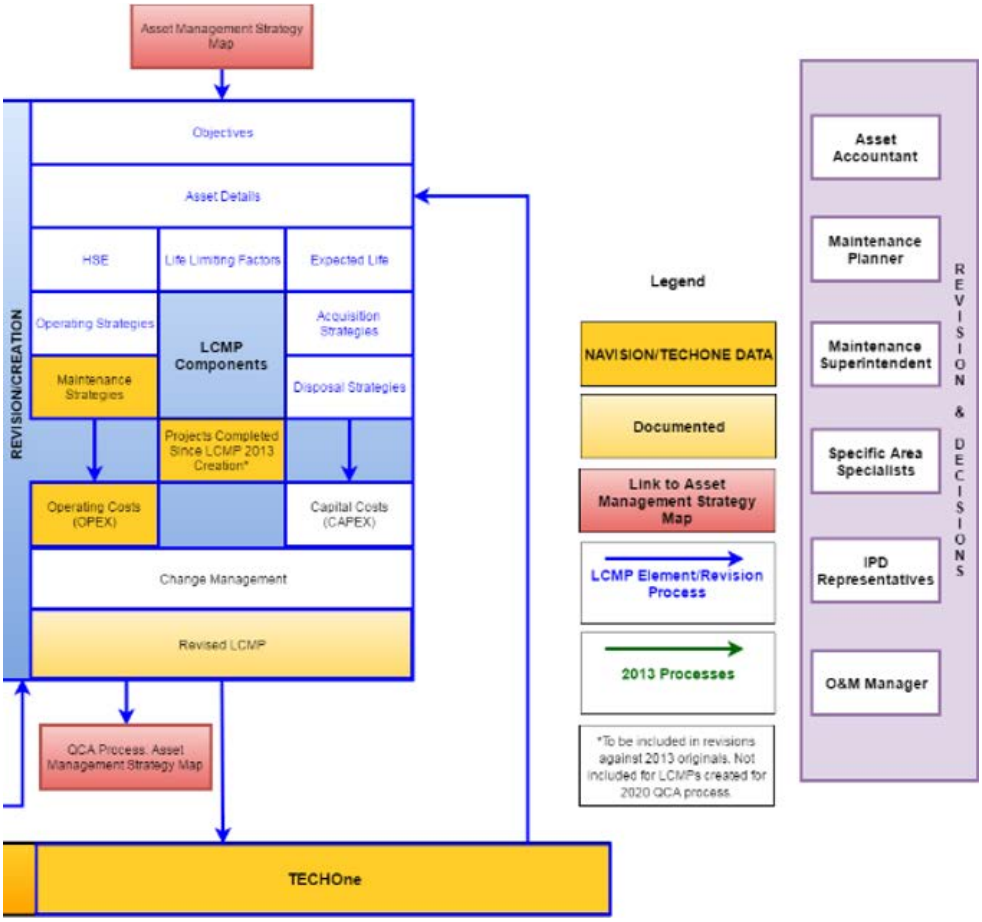
It is observed that:

- The Asset Management Strategy references GAWB's asset management objectives and defines minimum supply standards. To ensure alignment between the organisation's strategic objectives and decision-making criteria GAWB should consider demonstrating how the minimum supply standards support the organisation to achieve its asset management objectives.
- GAWB have developed an Asset Management Improvement Plan. A number of improvement initiatives identified in interviews with GAWB staff were not detailed in the asset management improvement plan. These included ongoing work on criticality to cascade it to an asset level (it is currently defined at an asset class level).
- GAWB's Asset Management Plan identifies data quality as a limitation to their asset management decision making capability due to the poor quality and availability of historical data prior to 2009 when some asset management functions were outsourced. Interviews with GAWB employees identified an opportunity to implement a continuous improvement approach to managing data quality to improve asset management decision-making processes. GAWB should consider developing an asset information strategy, or updating the asset management strategy, to detail data quality requirements, current state deficiencies and a roadmap for how the organisation will meet these requirements.

4.4 Lifecycle Management Plans

Over 50 Lifecycle Management Plans (LCMPs) have been developed since 2013 at an asset class level to support GAWB to optimise the lifecycle cost, risk and performance outcomes across its asset base. LCMP's are reviewed annually. The process for reviewing LCMPs is depicted in the following diagram, demonstrating the intended alignment between the Asset Management Strategy and LCMPs. Funding spreadsheets have been developed to support each LCMP, spreadsheets detail CAPEX and OPEX interventions from 2019/20 until 2039/40. Interventions are costed with a cost justification provided. Costing methodologies include historical work order analysis, vendor estimates and rough order of magnitude estimates. Interventions are aligned with LCMP strategies.

Figure 9: GAWB's process for reviewing LCMPs



The LCMPs define:

- Asset Class Details;
- Major Events (significant historical work performed on the asset class);
- Levels of service;
- Health, safety and environment considerations;
- Life limiting factors/current condition;
- Key Asset Risks;
- Improvement Actions;
- Lifecycle strategies;
- Funding forecasts; and
- Maintenance schedules (preventative).

It is observed that:

- It is not clear how levels of service detailed in the LCMPs relate to asset management objectives and customer service delivery outcomes. GAWB should consider updating the plans to detail alignment between levels of service and asset management objectives.
- It is not clear how life limiting factors detailed in the LCMPs have been identified and relate to the application of asset intervention models or customer service delivery outcomes. GAWB should

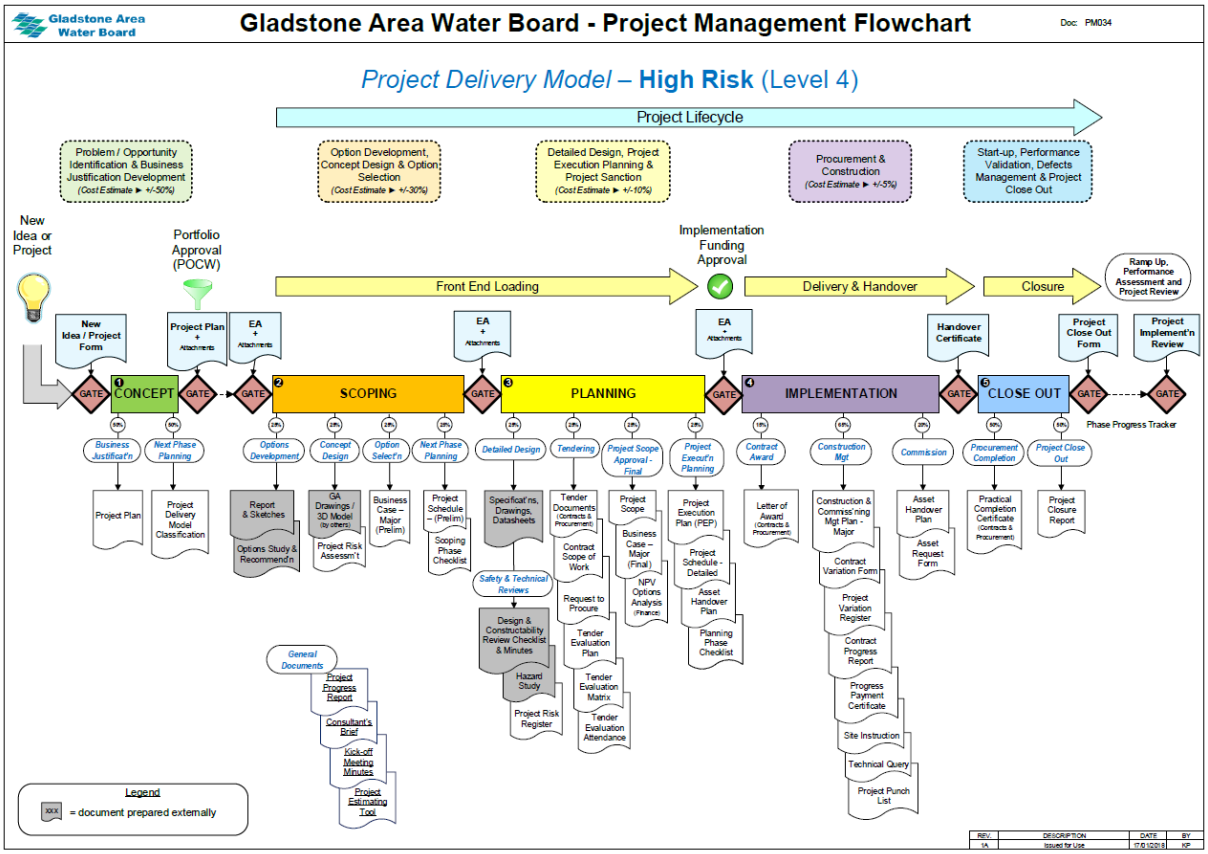
consider updating the plans to detail how life limiting decision-making criteria are systematically identified and support the achievement of asset management objectives.

- LCMPs are reviewed annually in a workshop with representatives from relevant business units. Information provided by GAWB indicated that during these workshops asset health and performance is considered in the review (as noted in GAWB's Asset Management Strategy map detailed in section 3.1). GAWB should consider updating the LCMP review process detailed in the Asset Management Plan to include consideration of asset performance and health.

4.5 Capital planning and prioritisation

GAWB have implemented a risk-based capital planning process dependant on a gateway approach. The capital planning process is detailed in the Project Management Framework (PMF) and supported by a comprehensive library of project management templates. The PMF defines four different project levels, projects are classified based on the outcomes of a risk classification assessment which includes evaluation of risks including health and safety, environmental, cost, reputation, technology and resources. A project delivery model is defined for each level. Project delivery models have different gateway requirements to reflect the degree of associated risk. A common Business Case template is provided in GAWB's PM templates, the 'Planning Phase Checklist' requires the Business Case template to be completed. Capital prioritisation is performed annually by the Project Review Committee.

Figure 10: Project delivery model – high risk level 4



It is observed that to improve transparency and repeatability of the process for prioritisation of the Major Capital Projects Work List it is recommended GAWB consider documenting decision-making

criteria, for example a quantified cost benefit analysis methodology aligned with GAWB's strategic objectives.

4.6 Summary

KPMG tested a number of asset management artefacts to assess their alignment with the ISO55000 series of asset management standards.

The testing indicated the following:

- **Alignment with leading practices** – GAWB are certified against ISO55001 the international standard for Asset Management.
- **Asset Management Policy** – GAWB have developed an asset management policy which defines the organisation's asset management objectives and defines guiding principles for the asset management system. The policy is endorsed by senior leadership demonstrating a commitment to asset management practice.
- **Asset Management Strategy** – GAWB updated their Asset Management Strategy in 2013. The document provides an overview of the strategies GAWB is implementing to achieve its asset management objectives. GAWB should consider updating the document to include detail on the application of maintenance strategies, their changing operating environment, performance evaluation, an asset information strategy and all current improvement initiatives.
- **Capital planning and prioritisation** – GAWB has demonstrated a robust, risk-based approach to capital planning through the adoption of a tiered capital planning process as documented in the PMF. GAWB should consider developing clearly documented processes for the prioritisation process to improve decision-making transparency.

Lifecycle Management Plans – LCMPs have been developed for GAWB's asset base. The development of LCMPs represents a significant improvement in how GAWB manage their asset base and the implementation of a leading practice asset management approach. The LCMPs detail how assets are managed with consideration for levels of service and risk. There is not currently a clear link between the LCMPs and GAWB's asset management objectives and customer service delivery outcomes.

5 Corporate Governance and Procurement

Corporate governance of capital and operational delivery and expenditure is a core business function and should therefore be assessed in terms of GAWB's business model and operating model. To properly assess the corporate governance and procurement processes of this type of organisation, we have utilised the International Standard, ISO55001 which requires a management system approach to asset management. Where business functions are not sufficiently covered by GAWB's management system, associated and referenced documents have been used such as the Asset Management Landscape that covers the globally agreed 39 subjects of asset management.

These standards state that the responsibilities and authorities of key functions should be defined. These definitions should include both internal and outsourced roles and responsibilities. The interfaces between organisational functions should be clearly established.

Procurement governance is largely focussed on the procurement of goods and services. Goods can be considered physical assets and services may consist of outsourced activities to deliver GAWB functions.

In this section, KPMG has provided an overview of the corporate and procurement governance processes adopted by GAWB including: investment governance; delegation of authority; and procurement.

5.1 Delegations of authority

GAWB have implemented an Authorities and Delegations Manual to define the following key governance functions:

- Delegation requirements as set out in the Water Act;
- Principles and limitations;
- Appropriate evidence of authorisation;
- Reporting; and
- Schedule of delegations and associated authorities and authorisation levels.

5.2 Capital investment governance

Capital prioritisation is performed monthly in the Project Review Committee meeting. Stakeholder interviews indicated the workshop represents the key prioritisation decision-making function for determination of the capital plan. The committee charter indicates that the committee's primary function is to recommend the annual works list including the Annual Performance Plan and 5 yearly Corporate Plan. The committee is chaired by the Chief Operating Officer and members include senior leaders from operations and maintenance and capital projects as well as engineering experts.

The decisions the committee is accountable for include:

- Prioritisation of the Major Capital Project Works list
- Variations to the Annual Major Capital Program and Budget
- Inclusion of new major and minor capital works on the plan

The Project Management Framework outlines a gated project management approach to capital planning and delivery. A project delivery model (see Figure 9) is defined for each project level. Project delivery models have different gateway requirements to reflect the degree of associated risk. Gateway requirements are detailed in the Project Management Framework. Project Management Templates reference the Authorities and Delegation Manual for authorisation of key project documentation to meet gateway requirements.

It is observed that:

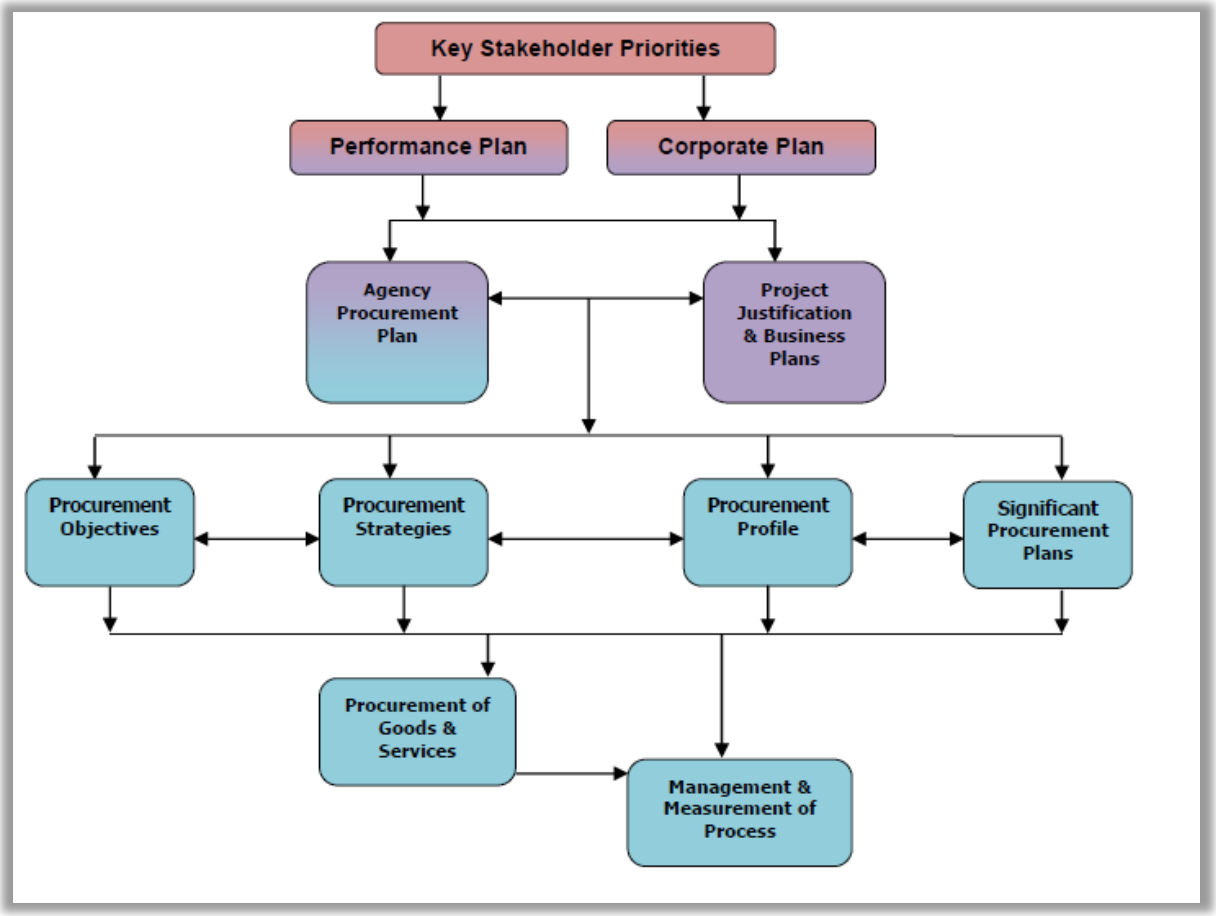
- The Project Review Committee serves a significant asset management function, but is not currently included in the Asset Management Strategy Map. GAWB should consider updating the Asset Management Strategy Map to include the monthly Project Review Committee meeting as a decision-making forum.

5.3 Procurement

GAWB has developed an Agency Procurement Plan for the purpose of meeting the organisation's procurement obligations as set out in the Queensland Procurement Policy (2018). The Queensland Procurement Policy is the government's overarching policy for the procurement of goods and services.

GAWB's procurement activities underpin and support GAWB's strategic objectives. The following chart illustrates the relationship between the Agency Procurement Plan and GAWB's planning framework.

Figure 11: GAWB's Agency Procurement Plan and planning framework



Source: GAWB's submission 2021-25 Period

The Agency Procurement Plan outlines key GAWB's strategic initiatives and performance indices to achieve its procurement policy aims. The procurement policy aims to:

- Focus on the economic benefit to Queensland;
- Maximise Queensland suppliers' opportunity to participate;
- Support regional and remote economies;
- Support disadvantaged Queenslanders; and
- Stimulate the ICT sector and drive innovation.

To achieve this, GAWB have identified six principles with associated strategies, KPIs and target outcomes. These principles are:

- Putting Queenslander first when securing value for money;
- Advancement of economic, environmental and social objectives;
- Integrity, probity and accountability;
- Leaders in procurement practice;
- Working together to achieve outcomes; and
- Governance and planning.

An example of associated KPIs and target outcomes is presented below:

[redacted]

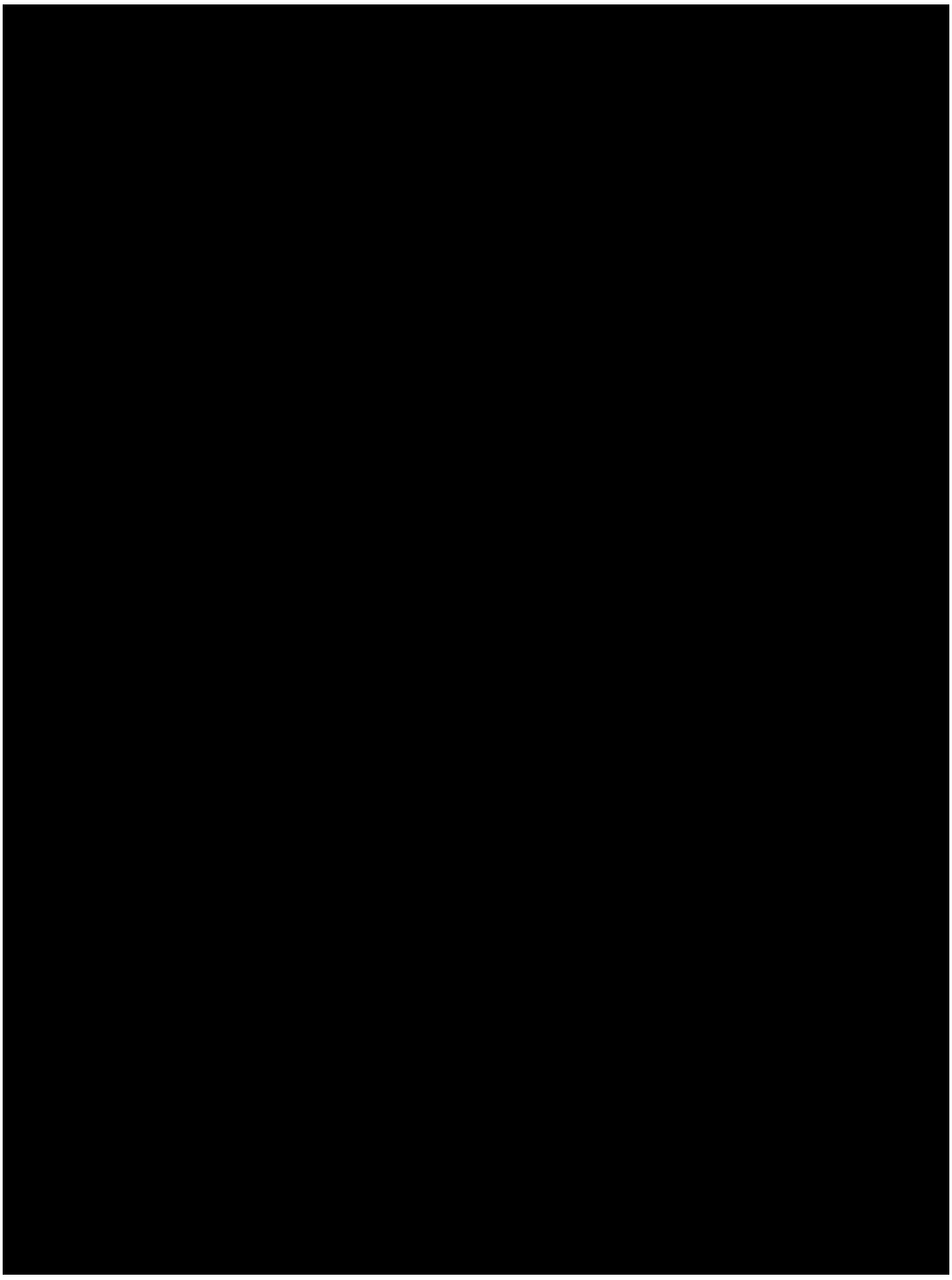
Principle	Strategy	Measurement	2018/19: Targets
2. Advancement of Economic, Environmental and Social Objectives To use procurement to advance the government's economic, environmental and social objectives, and support the long-term wellbeing of our community. • consider strategies to ensure capable and competitive local suppliers are afforded full, fair and reasonable opportunity to supply government • ensuring that tenders are free from specifications or requirements that could limit opportunities for local industry and workforces • best endeavours are used to do business with ethical, environmentally and socially responsible suppliers • delegate to a level closest to the geographical location where goods or services are to be supplied when making procurement decisions for low value and low business risk procurement • every procurement activity is different. Decisions to advance objectives take into account a range of factors	Public Tenders are all included in local advertising platforms for purpose of ensuring local suppliers are informed and provided an opportunity to participate in procurement with GAWB. Strategy includes evaluation criteria which identify the various principles as noted and provide a weighting against these criteria	Public Tenders shall be included in local advertising platforms	[redacted]

Implementation of the agency policy is supported by a number of frameworks and templates. These include:

- Contract Management Framework – GAWB takes a risk based approach to contract management to optimise value provided by contracts. The approach is detailed in the Contract Management Framework which defines a tiered approach to contract management based on the contract risk and value. The framework defines requirements around contract set-up, management and close out including establishing and managing performance requirements. The framework is supported by a library of contract management procedures.

- Contract Management Procedure – these support implementation of the framework. The procedure includes a flowchart of procurement gateway requirements for different expenditure thresholds.
- Guideline to GAWB Procurement Thresholds – defines procurement requirements based on expenditure thresholds
- Financial Management Practice Manual – Provides detailed procurement requirements including the development of significant procurement plans for high cost, high risk procurement activities, types of arrangements with suppliers, buying locally, sustainability and ICT procurement requirements.
- RFQ to Contract Process with Timeframes – defines the process, key activities and associated timelines for progressing from an RFQ through to awarding a contract
- Scope of works template
- Tender evaluation forms
- Tender evaluation matrix template – The agency procurement plan principles are embedded in GAWB's tender evaluation matrix, which requires key elements of the procurement principles to be considered in evaluation of tenders.
- Justification for contract variation template
- Catalogue products maintenance schedule and tasks template
- Process documentation regarding contracts and procurement records in Technology1

[redacted]



5.4 Summary

KPMG's review of GAWB's procurement and governance process indicated a robust end-to-end process supported by guidelines and templates. Overall, GAWB's procurement process reflects a high standard and provide a strong foundation to the efficiency of the forecasts. Alignment was evident between procurement strategies and business templates demonstrating how strategic principles are embedded in day-to-day procurement decisions. To improve process transparency GAWB should consider reviewing specific key artefacts to ensure that mandatory requirements are clearly defined.

6 Capital expenditure

Capital expenditure (capex) forms a critical input into the development of GAWB's water prices. Under the regulatory arrangements applying to GAWB, GAWB is able to recover a reasonable return on and of the assets that form part of its regulatory asset base (RAB), and future capex is an integral input to the RAB.

Under the Treasurer's referral notice, the QCA is required to undertake a price monitoring investigation of GAWB for the period 1 July 2020 to 30 June 2025. To do this (and amongst other things), the QCA is tasked with considering prices which provide GAWB sufficient revenue to recover prudent and efficient costs incurred from providing bulk water supply services including catchment management and recreation facilities.

For capex to be included in the RAB, the QCA must form a view on the prudency and efficiency of capex using an appropriate sample size and focusing on areas which would give rise to material price changes, rather than matters which are likely to have a minor or inconsequential impact[11].

To form a view of the prudency and efficiency of capex, the QCA has engaged KPMG to assess the reasonableness of GAWB's capex forecasting methodologies and their application, including inputs, assumptions and modelling. KPMG has sought assistance from Arup for a review of a sample of proposed capex projects. The combined team is henceforth referred to as KPMG.

The QCA has sought for KPMG to consider and provide recommendations on:

- the prudency and efficiency of actual capex incurred in the current regulatory period (based on a sample of projects), and the drivers of any forecast divergence from historical trends;
- the prudency and efficiency of GAWB's forecast capex program taking into account the uncertainty around projects at an early stage of development, and suitable approaches for dealing with risk and uncertainty (recognising that such projects will have relatively lower levels of documentation than projects at a later stage of development);
- the reasonableness of proposed escalation rates applied to forecast capex outlays;
- the nature and value of any proposed renewals expenditure assessed as not prudent or efficient. Where the consultant considers that the projected timing and/or cost of an expenditure item is not efficient, the consultant is required to recommend an alternative estimated timing or cost estimate;
- the deliverability of GAWB's proposed capex programs.

To do this, the QCA has requested KPMG review a suitable sample of projects that have already occurred (2015–2019 actuals), are underway (2019–20) or are forecast to occur (2020-25).

6.1 The QCA's assessment framework

Capex may relate to a diverse program of capital works on a single asset (such as a project for a water treatment plant upgrade or an offline storage reservoir) or a relatively uniform program of capital works on a series of assets (such as a meter replacement program).

For the purposes of this review capex is considered by the QCA to be:

[11] https://www.qca.org.au/wp-content/uploads/2019/07/gawbreferral.pdf

- **prudent** if can be justified by reference to an identified need or cost driver—e.g. to meet legal or regulatory obligations, new growth, renewal of existing infrastructure or an increase in the reliability or the quality of supply that is explicitly endorsed or desired by customers.
- **efficient** if the:
  - *scope* of the works (which reflects the general characteristics of the capital item) is the best means of achieving the desired outcomes after having regard to the options available, including more cost-effective network solutions, the substitution possibilities between capex and opex and non-network alternatives such as demand management (also referred to in capex and opex trade-offs below);
  - *standard* of the works conforms to technical, design and construction requirements in legislation, industry and other standards, codes and manuals. Compatibility with existing and adjacent infrastructure is relevant, as is consideration of modern engineering equivalents and technologies; and
  - *cost* of the defined scope and standard of works is consistent with conditions prevailing in the markets for engineering, equipment supply and construction. The consultant must substantiate its view with reference to relevant benchmarks and information sources. For example, the source of comparable unit costs and indexes must be given and the efficiency of costs justified.

6.2 Our assessment framework

To support the QCA's framework, we have identified a number of tests that we have applied to each sample project. These include:

For prudency:

- *Driver* - Has GAWB demonstrated reasonable drivers for the expenditure?
- *Timing* – Is the timing of expenditure justified?
- *Documentation* – Does GAWB have appropriate justification for the expenditure?

For efficiency:

- Scope of works
  - *Options analysis* - Has GAWB demonstrated the selection of the optimal solution?
  - *Governance* – Can GAWB demonstrate that the project/program has been through its capital planning and governance framework? [12]
- Standard of works
  - *Standards – Does the technical solution meet the relevant standards and obligations?*
- Cost of work
  - *Estimate* – Has GAWB justified the cost estimates used to underpin the proposal?
  - *Method* – Can GAWB demonstrate an appropriate forecasting method?
  - *Customer* - Has the proposed option considered the impacts on customers?
  - *Opex* – Has GAWB appropriately considered capex-opex trade-offs for meeting the investment need?

[12] As described in GAWB's Project Management Framework (PMF, RFI0009 & RFI 0074, noting that flowchart PM043 for Level 2 & 3 detail is absent).

We have used the above framework to guide our assessment of each project. Our initial draft analysis of the historical and forecast sample projects was presented to GAWB so that they could respond with additional information and clarifications.

Further, we have also sought to assess, at a program wide level, whether there are any systemic issues with regard to how GAWB has completed its capital forecasting. These systemic issues are determined by assessing whether GAWB has appropriately implemented its capital planning and asset management framework for the selection of projects reviewed, and whether there are any consistent shortfalls in meeting the expectations for prudency and efficiency. Where there is a shortfall, we have sought to make an adjustment to the remaining program of works.

When assessing the prudency and efficiency of individual projects, we have applied the following review process to those projects with significant forecast expenditure in the next regulatory period:

- For historical projects which the QCA has previously accepted as prudent for the 2015-20 regulatory period, the focus is on the efficiency of delivery, unless the project scope has expanded significantly from that subject to the prior review where additional consideration might be warranted.
- If a project is not demonstrated to be prudent, then:
  - For projects delivered during the current regulatory period (2015-20) but not previously subject to a prudency review, these projects should not be rolled into the RAB; and
  - For projects proposed to be delivered during the next regulatory period (2020-25), these projects be excluded from the capital program used to set the RAB.
- where a project is at an early stage in the investment governance process (that is, within Gates 0-2 of the PMF) and, while considered to be prudent:
  - there is insufficient supporting information to clearly demonstrate the efficiency of the project, we have recommended exclusion of that project from the proposed capital program; and
  - there is sufficient information to demonstrate the efficiency of the project, however that information could be improved, we have adjusted the forecast to one that better reflects the efficient costs of the project/program, given the current level of information provided.
- where a project is determined to be both prudent and efficient (i.e. the supporting documentation demonstrates the scope, standard and cost of works), it is appropriate that this expenditure be considered in determining pricing for the regulatory period (2020-25).

6.3 Historical capex 2015-20

The following section details:

- The outcomes from the QCA's 2015-20 GAWB Price Monitoring Investigation, and GAWB's performance against the findings;
- Analysis of GAWB's overspend against the budgeted capital expenditure;
- Actual/estimated capex for the 2015-20 period by driver; and
- Sample historical capex project assessment.

6.3.1 Outcomes following the 2015-20 GAWB Price Monitoring Investigation

The current regulatory period goes from 1 July 2015 to 30 June 2020, and is stated as 2015-20 in this report.

As actual expenditure incurred during the 2015-20 regulatory period is estimated to be higher than that previously forecast, an ex-post review of actual capital expenditure is required.

GAWB expect to capitalise $122.48 million of projects over the current regulatory period, $20.95 million more (or 21 per cent) than that which was accepted as prudent and efficient for the 2015-20 regulatory period by the QCA (as shown in Table 8)[13]. The majority of overspend is the result of unexpected capital expenditure to comply with mandated external requirements identified during the current regulatory period. The total overspend represents approximately 17 per cent of the delivered expenditure and 21 per cent of the original the QCA allowance for the current regulatory period.

Table 9: Total Capex the QCA Recommended Allowance vs GAWB Actual/Estimated 2015-20

Capex ($m)	2015-16	2016-17	2017-18	2018-19	2019-20	Total
Forecast	36.87	35.25	4.90	11.77	12.74	101.53
Actual *	14.01	20.85	29.00	40.31	18.31	122.48
Variance						20.95

* Including forecast capitalisation for the 2019-20 year. And includes IDC. *Source: GAWB, Part B, Table 11.1, page 103, and Arup analysis of RFI 33-34 Actual Capex 2015-2019 Arup Capex Analysis 20191128.xlsx*

KPMG notes that this represents a significant level of expenditure over and above what was approved. The following table compares, for GAWB's ten largest projects, actual expenditure during the current period, against the budget established during the last price monitoring investigation.

[13] Refer GAWB, *Bulk Water Price Review, GAWB Submission, 2021-25 Period*, Part A, page 103.

Table 10: Largest Ten Capex GAWB's 2015 budget allowance vs actual capex

Project	Forecast Year of Commission / Cost Driver	Forecast ($m)	Actual ($m)	Variance ($m)	Variance (% Forecast)
Offline Storage & Repump Station	2017, Regulatory	22.50	38.04	15.54	+69%*
Awoonga Dam Spillway AFC Upgrades	2015, Capacity	9.4	8.99	-0.41	-4.4%
Accommodation Project	2016, Business Process Improvement	[redacted]	[redacted]	[redacted]	[redacted]
Awoonga Dam VFD Replacement	2016, Replacement	4.21	6.66	2.45	+58.2%*
GWTP/YWTP System Interconnection	2019, Capacity	6.60	6.29	-0.31	-4.7%
HLPS & LLPS Switchboard Upgrade	2016, Replacement	5.81	4.78	-1.03	-17.8%
[confidential]	2016, Replacement	[redacted]	[redacted]	[redacted]	[redacted]
ERP Replacement Project (Tech One)	2016, Replacement	2.61	3.38	0.78	+29.8%
Awoonga Dam Pump Station Building Refurbishment	2015, Replacement	2.50	2.82	0.31	+12.5%
Lake Awoonga Land Rationalisation	2015, Regulatory	2.23	2.74	0.51	+22.9%
Totals		[redacted]	[redacted]	[redacted]	[redacted]

* These projects were sampled for more detailed review of prudency and efficiency & are discussed below. *Source: GAWB, RFI 33-34 Actual Capex 2015-2019.xlsx and Arup analysis, it is assumed these numbers include IDC as stated by GAWB because all listed projects total to Table 12 above.*

Due to this overspend, KPMG has been asked to review a small sample of these projects to understand the drivers for additional expenditure above that budgeted for. These projects include:

- Offline Storage & Repump Station;
- Awoonga Dam VFD Replacement; and
- Accommodation Project.

Our assessment of these projects is detailed later in this report.

Analysis of GAWB's largest ten capital projects demonstrates a material average overspend of [redacted] capital against the budgets set. Of the 10 projects analysed:

- Six projects demonstrate an overspend, three demonstrate an underspend and one was delivered on budget;
- Of the six projects overspent, the average overspend was 70 per cent higher than the budgeted allowance;
- All six projects where there was an overspend was at least 10 per cent higher that budget, a material variation given these projects included contingency dependent on the stage of the gateway relevant for its stage in the planning process
- Of the three projects underspent, the average underspend was 8 per cent below that which was budgeted for.

Given the materiality of the overspends on a large number of major projects, this raises potential concerns:

- The cost estimates produced by GAWB may lack rigorous analysis and hence may not be a good estimate for the likely cost of the project;
- GAWB may not appropriately apply its capital planning and governance framework, impacting on the quality of cost estimates and/or project delivery;
- GAWB may not be familiar with the appropriate standard of works required, and hence require a number of variations during implementation to achieve compliance;
- GAWB may not have tight controls over capital spend, with the thought that any overspends will be rolled into the RAB without question, hence allowing them to recover these costs at no additional risk. This is not the intent of incentive based pricing mechanisms, even when they are under a price monitoring regime; and
- There may be a lack of detailed reference design and documentation prior to issuing tenders, which means risks are not well known (e.g. Geotech, planning etc.) resulting in variations from time delays, add-ons and re-design / re-work.

There may also be other exogenous factors impacting the cost of delivering these projects, such as;

- The price and/or availability of construction materials/resourcing in the Gladstone region;
- Changes to regulatory obligations that have driven additional costs (e.g. potable water quality requirements); and
- Costs imposed on GAWB by other utilities and/or regulators during the delivery of projects, but unknown at the final Business Case at Investment approval.

We note that these overspends have been efficient and/or partially offset by reductions in expenditure. Looking further into GAWB's actual expenditure, we reviewed all projects that have been delivered over the last full five year period (1 July 2014 to 30 June 2019), against what budgeted for[14], and noted the following:

- GAWB forecast to complete 206 unique projects[15] with a value of $105.8 million, during the five years 2014-19;
- Of these projects, 122 have been completed;
- Of these 122, KPMG was provided data that allowed comparison of forecast and actual expenditure for 79 projects delivered between 1 July 2014 and 30 June 2019[16]. Given our assessment that both the Offline Storage and Repump project and the Awoonga Dam VFD Replacement project were prudent and efficient (refer to Section 5.3.3), we have removed these from the sample of 79 projects (so as not to skew the analysis). Of the remaining 77 projects:
    - They were forecast to cost $54.85 million, but were delivered for $66.69 million;
    - Of the 77 projects, the total variance was a 22 per cent overspend:
        - 40 of these 77 projects overspent against the budgeted allowance, by a total of 35 per cent;
        - 19 of these 77 projects underspent against the budgeted allowance, by a total of 23 per cent; and
        - 18 of these 77 projects were within budget (within +/- 10 per cent)

[14] GAWB, RFI33-34 Actual Capex 2015-19
[15] This is the number of unique project numbers assigned in the sheet "Actual capex 2015-19" in *RFI 33-34 Actual Capex 2015-19*. This excludes $11.8 million of replacement capex of existing assets, which doesn't have a project number assigned.
[16] Within GAWB's response to RFI33-34, it provided the forecast allowance for the 2015-20 period and actual capex for the 2014-19 period.

- 22 projects were cancelled at a saving of $0.94 million;
- 23 projects were deferred/postponed, at a saving of $5.65 million;
- Of the 23 postponed, 10 have been included within the 2020-25 capital forecast at a value of $1.47 million;
- 23 'replacement' driven projects[17], at a value of $11.77 million, were included within the budget that cannot be easily mapped to the list of projects delivered, therefore it cannot be determined whether these are on/within budget;

A 22% average overspend for the 77 projects that could be compared with their forecast, is material, noting these project budgets all included contingency reflective of the stage of the planning process they were at. Based on the analysis of major projects and all projects delivered (2014-19), there may be a systemic issue with the delivery of capital projects that requires further investigation. As noted, these overspends may be driven by exogenous factors (e.g. changes to regulatory compliance that have driven cost or changes in external market conditions), and underspends due to efficiencies achieved in capital delivery. We have sought to explore these below, by looking at the cost shift between cost drivers.

6.3.2 Actual/estimated capex for the 2015-20 period by driver

GAWB classifies the cost drivers for its capex projects into the following areas:

- **Risk** - residual risk rating will be lowered to an acceptable level by completion of the project;
- **Replacement** - project required to replace assets that are assessed as being at the end of their useful life or which are assessed as being non-maintainable from an efficiency point of view;
- **Regulatory** - project undertaken to achieve compliance with a law or regulation, or to align with a Government policy or guidance;
- **Capacity** - project required to meet increased customer demand through augmentation of delivery network or sources of water supply; and
- **Business Process Improvement & Community Initiatives** - project to bring efficiencies to GAWB's operations or an explicit request from the Community Consultative Forum, CCF, or customers.

Within RFI 33-34, GAWB has documented the key driver for each project. The following table details forecast and actual expenditure for the period 1 July 2014 to 30 June 2019. Without any further analysis, the numbers demonstrate a shift from risk and replacement works to regulatory compliance and capacity works, during the current regulatory period.

[17] GAWB, RFI 33-34 Actual Capex 2015-19 - Prior to the LCMP being established, predictive replacement capex based on the age and replacement costs of the individual assets identified in the RAB was included in the capital allowance to determine prices to apply from 1/7/2015. It was anticipated that additional projects, not individually identified with the capital allowance, were forecast to be needed across the regulatory period. As a result of assets reaching end of life, various asset replacement projects that were not individually identified in the build-up of the capital allowance have occurred and are reflective of the work anticipated by this tranche of replacement capex. As such, these can't be clearly mapped with the projects delivered.

Table 11: Capex by Primary Cost Driver 2014-19

Cost Driver	Forecast ($m)	Actual ($m) (*1)	Variance ($m)	Variance (%) (*2)
Risk	33.45	6.72	-26.73	-80%
Replacement	55.81	43.89	-11.92	-21%
Regulatory	14.22	46.30	+32.08	+226%
Capacity	2.48	18.72	+16.24	+655%
Business Process Improvement & Community Initiatives	7.44	9.58	+2.14	+29%
Total	**113.4**	**125.2**	**+11.8**	**10.4%**

*(*1) : Actual capex provided by GAWB is for the period 2014-2019 as actual capitalisation by project in the last 12 months to 30th June 2020 not yet available.*
*(*2): Negative numbers and % are savings on Forecast previously accepted by the QCA. Positive are cost overruns.*
Source: GAWB, RFI 33-34 Actual Capex 2015-2019 Arup Capex Analysis 20191128.xlsx , it is assumed these numbers include IDC as stated by GAWB because all listed projects total to Table 12 above.

On further analysis, it appears that 13 of the projects have been reclassified, either deliberately or accidentally. Of these:

- Five were no longer classified as risk, with a budgeted cost of $28.7 million;
- Six were no longer classified as replacement, with a budgeted cost of $3.4 million;
- One was a business process improvement project, with a budget cost of $6.6 million; and
- One was a regulatory project, with a budgeted cost of $0.1 million.

Of these changes:

- Two projects are now classified as risk, with a budgeted cost of $1.36 million;
- Three projects are now classified as replacement, with a budgeted cost of $3.93 million;
- Two projects are now classified as regulatory, with a budgeted cost of $24.73 million;
- Two projects are now classified as capacity, with a budgeted cost of $6.77 million; and
- Four projects are now classified as business process improvement, with a budgeted cost of $1.99 million.

This has a net impact of the following on GAWB's analysis:

- Risk (-$27.34 million)
- Replacement (+$0.53 million)
- Regulatory (+$24.73 million)
- Capacity (+$6.77 million); and
- Business process improvement (-$4.61 million)

Taking these changes into account, we have adjusted the forecast capex number in the following table, to reflect this.

Table 12 : Capex by Primary Cost Driver 2014-19

Cost Driver	Forecast ($m)	Actual ($m) (*1)	Variance ($m)	Variance (%) (*2)
Risk	6.11	6.72	+0.61	+10%
Replacement	56.34	43.89	-12.45	-22%
Regulatory	38.85	46.30	+7.45	+19%
Capacity	9.25	18.72	+9.47	+102%
Business Process Improvement & Community Initiatives	2.83	9.58	+6.75	+239%
Total	**101.53**	**125.20**	**23.7**	**18.9%**

These changes to the classification of driver largely explain the perceived shift in expenditure away from risk and regulatory, and does not demonstrate any real deliberate shift away from risk and regulatory. Updated analysis demonstrates a material increase in regulatory, capacity and business process improvement works. There has been a 22 per cent reduction in replacement works.

On the basis of analysis performed on the 10 largest projects, the program of works delivered and driver analysis, KPMG recommends GAWB provide the QCA with further information to validate these over-spends. Where GAWB cannot justify these variations being outside of their control, the QCA may seek to adjust the capital expenditure that can be rolled into the RAB, to reflect the material overspend (less our recommendations on the sample of historical projects reviewed).

6.3.3 Sample project assessment

KPMG agreed a scope of work with the QCA to review a sample of three historical projects in detail to better understand how GAWB has been implementing its PMF and project delivery. The sample of delivered capital projects for review covered three projects that demonstrated either a material change in budget and/or scope.

To ensure the projects were fully understood, the KPMG team spent two days interviewing (in person) lead project proponents inside GAWB who had worked in or closely to the sample projects.

KPMG also provided GAWB with a request for information, seeking evidence that supports the prudency and efficiency of these delivered projects. The following sections of this report details each of these sample projects and our assessment against the criteria established by the QCA, and discussed above.

Sample project 1 - Offline storage and repump station

Overview

All water supplied by GAWB is sourced from the Boyne River at Awoonga Dam, and is supplied to Gladstone industries and GAWB water treatment plants for Gladstone town water supply via GAWB's Raw Water Supply System. This system includes the Dam outlet works, Awoonga Dam Pump Station, a single pipe from the pump station under the spillway, and dual pipelines from Awoonga to Gladstone.

In 2007-08, GAWB undertook investigations of the Awoonga High Dam, resulting in the Dam Safety Compliance Project. The investigations and implementation of the Compliance Project highlighted the criticality of the raw water supply system at Awoonga, as several components cannot be bypassed and there are no other alternative water sources for Gladstone industrial or municipal water supplies. Limited in-system storage also meant that shutdowns for maintenance and asset replacement works

were severely constrained. Additionally, works within the Compliance Project (2010-2015) could only be achieved in stages with a series of short shutdowns, which had a significant effect on project cost, and the potential for customer interruption if there were time overruns.

After several studies, GAWB proposed to construct a 1,200 ML Offline Storage Facility and Standby Pump System in a small valley adjacent the existing Toolooa 50 ML reservoir. The purpose of this storage was to provide redundancy for outlet and pipeline components from Awoonga Dam. Under the conditions prior to this project's initiation, failure of either the Awoonga Dam Pump Station or Awoonga to Gladstone pipeline could result in a supply outage of 14 days.

Key Assumptions and Status

Table 13: Offline storage and repump station key assumptions and information

Information source	• Business Cases: Medium Project (2012), Major Project (2015), Major Project (2016) • CDM Smith Dam Safety Risk analysis • Entura Dam Safety Risk analysis • Board Paper No. 2016-06-3.02 Key Points for Business Case. • Board Paper No. 2018-08-2.01 Business Case Variation. • Capex Deviation in Spend, Time & Scope since 2015 • Cardno Offline Water Storage Failure Impact Assessment • Design Report • Project Variations Register
Investment Driver	• Risk of failure to supply for extended period • Efficiencies gained during inspection and maintenance
Intended Outcome	• Ability to take critical components of Awoonga Dam, Awoonga Dam pump station and Awoonga to Gladstone pipeline out of service for inspection and maintenance up to 14 days without supply interruption • Ability to maintain supply to GAWB's customers for a 14 day period in case of a failure of critical components of Awoonga Dam, Awoonga Dam pump station and the Awoonga to Gladstone pipeline • Deferral of elimination of the requirement to replace the 50-year-old DN700 pipeline between Awoonga Dam and the offline storage site (avoided future capital expenditure of c. $30M)
Current Project Status	• The project was completed in 2018-19
Procurement and project delivery Process	• Review of Critical Infrastructure by R2a • Feasibility and site selection study for offline storage capable of providing a 14-day raw water supply independent of pumping operations at Awoonga Dam • Alternatives to offline storage identified • Preliminary site investigations 2010/2011 to confirm no intrinsic issues with the site that would prohibit construction of the offline storage • Design of offline storage and standby pumping system (2012-2015) o GAWB prepared consultancy brief based on Aurecon's conceptual design and invited proposals from four engineering consultancies o Cardno selected to undertake detailed investigation and design on basis of comprehensive bid and value o A comprehensive schedule and cost estimate was produced

Options analysis

In February 2009, GAWB commissioned Risk & Reliability Associates (R2a) to undertake a due diligence review of GAWB critical infrastructure requirements. External threats and common mode failures identified that could significantly disrupt the supply of water for extended periods included drought, dam breakages, major failures and major maintenance. The review also identified possible options for safeguarding water supplies.

Since 2009, GAWB has commissioned a number of studies to identify cost-effective solutions to mitigate interruption of supply and improve the reliability of the system. Following the 2010 Price Review, GAWB investigated a number of alternatives to the offline storage project, including:

- Offline storage at other identified sites (not adjacent to Toolooa Reservoir);
- Pontoon pumping station on Awoonga Dam;
- Pontoon Pump Station with redundant pipeline between Awoonga Dam and Toolooa Reservoir; and
- 'Do nothing' or undertake temporary works as necessary for planned and unplanned maintenance.

GAWB commissioned CDM Smith to undertake a high level Multi Criteria Analysis (MCA) considering all viable alternatives to the Offline Storage. The MCA took place in a mini-workshop on 19 August 2014 with a representative of GAWB and information inputs from previous reports. The criteria used in the Business Case were adopted with some modification and additions as follows:

Table 14 : MCA Criteria for offline storage and repump station

Risk mitigation	To what extent does the option mitigate the risks of planned and unplanned events
Cost	Capital and operating
Staging and ability to upgrade	Option to meet future demands and/or ease of upgrades to meet future demands
Raw water quality	Potential impact on the quality of water entering the WTP (both advantageous and disadvantageous)
Complexity of operation and maintenance	Potential to introduce new and/or increase high risk activities required to operate and maintain the option
Stakeholder impacts	Potential impacts on external stakeholders excluding customers

The criteria weightings were determined using Paired Comparison Analysis – a tool for weighing relative importance of options, particularly where priorities are not clear, options are completely different, evaluation criteria are subjective, or where competing priorities exist. Using the outcomes of the comparison as a guide, and based on experience and understanding of workshop participants, the below weightings were determined:

Table 15 MCA criteria weightings for offline storage and repump

Criteria		Weighting
Risk mitigation	To what extent does the option mitigate the risks of planned and unplanned events	40%
Cost	Capital and operating	30%
Staging and ability to upgrade	Option to meet future demands and/or ease of upgrades to meet future demands	5%
Raw water quality	Potential impact on the quality of water entering the WTP (both advantageous and disadvantageous)	10%
Complexity of operation and maintenance	Potential to introduce new and/or increase high risk activities required to operate and maintain the option	10%
Stakeholder impacts	Potential impacts on external stakeholders excluding customers	5%

The MCA identified the Offline Storage project as the preferred option. Although lower in cost, the Pontoon Pump Station scored a significantly lower rating because it did not mitigate risks associated with Awoonga Gladstone pipeline failure and more widespread risk that may impact Awoonga Dam area such as electrical power supply failure and loss of road access during flooding. It was also considered to create additional risks, such as operability during flooding, including debris impacting the floating pipeline from the pontoon to the shore and operational risks should the pontoon require maintenance access during flood events.

The QCA in its Final Report of May 2015[18] considered that a pontoon pump station on the Awoonga Dam reservoir as a more efficient option. GAWB subsequently sought independent opinions from GHD, CDM Smith and Entura, which effectively concluded that the costs associated with risk mitigation required for the pontoon pump station would be significant (and would not remove the risk).

Following this additional analysis and subsequent to the QCA's Final Report, GAWB has proceeded with the Offline Storage & Repump Station which had a higher estimated cost than the Pontoon Pump Station allowed for in the QCA Final Report.

Actual Capital Expenditure

The QCA had allowed $22.5m (inc. IDC) into its price monitoring decision for the 2015-20 regulatory period, with an assumed commissioning date in the 2016-17 financial year. Subsequently GAWB undertook additional investigations and has made the decision to implement the more comprehensive option for the Offline Storage & Repump Station. GAWB has indicated that the project will now be complete and capitalised in financial year 2018-19 with a budget forecast of $38.0m (inc IDC).

Table 16 : Actual capex capitalisation – Offline Storage & Repump Station ($ million, nominal)

FY	2016	2017	2018	2019	2020	Total
QCA approved capex	$0	$22.50	$0	$0	$0	$22.50
GAWB capex (*1)	$0	$0	$0	$35.6	$0	$35.6
Capitalised (*2)	$0	$0	$0	$38.04	$0	$38.04

*(*1) actual expenditure.*
*(*2) Includes actual expenditure and interest during construction.*
Source: GAWB, RFI0094, Board Paper extract, 18 April 2019.

[18] QCA, Final Report, Gladstone Area Water Board Price monitoring 2015-20, May 2015, Section 4.5.4, Conclusion, page 34.

Assessment

Prudency

GAWB states that the creation of an offline storage and standby pumping system is specifically aimed at responding to corporate risks. Following the QCA Final Report of May 2015, GAWB undertook additional analysis under its PMF and developed a detailed Business Case dated August 2016. In the Business Case it identified a number of corporate risks which this expenditure would ameliorate, including the regulatory risk of non-compliance with Dam Safety Provisions[19], and the customer risk of not meeting continuous supply under its CSS commitments.

GAWB are required under the Dam Safety Regulations[20] to undertake a comprehensive dam inspection every 5 years, including internal inspections of the inlet structures and discharge conduits. Given the 14 hour time window available to GAWB (before customer supply interruptions occur), these inspections can only be undertaken with visual and photographic inspection to identify maintenance issues. No detailed surface inspections or large maintenance activities are possible within this time window.

The Dam Safety Regulations also require a safety review every 20 years which is now due by 30 June 2022. The regulatory obligations for detailed dam inspections and the potential need to maintain critical infrastructure assets over a period of longer than currently available, were key factors during the previous QCA review, and its decision to agree the prudency of this project.

The current residual risk rating of failure to supply was deemed significant (consequence: extreme, probability: unlikely) due to potential infrastructure failure at Awoonga or in the Awoonga-Gladstone Pipeline between Awoonga and the offline storage site. The residual risk following completion of the project was deemed moderate due to a reduction in probability (consequence: extreme, probability: rare).

Previously, all water was sourced from Lake Awoonga and pumped through the Awoonga-Gladstone Pipeline. Critical infrastructure, where a single point of failure could result in water supply failure in the system include:

- Awoonga Dam outlet pipe and pump station suction pipe;
- Awoonga Pump Station – pumps and motors;
- Awoonga Pump Station – valves and pipework;
- Awoonga PS discharge pipe and surge vessel;
- Pipeline under spillway channel;
- Power supply to pump station;
- Pipelines (dual) to Gladstone – failure of one pipe causing washout and failure of adjacent pipeline; or
- Pipelines (dual) to Gladstone – breach of Saddle Dam 3 causing major erosion and washing out pipelines.

GAWB also identified efficiencies that the project would bring to its operations. According to the 2016 Business Case, average day contracted demand on the Awoonga-Gladstone raw water supply system was approximately 100 ML/d. With all reservoirs full, there was approximately 138 ML of available raw water storage, and actual daily demand varied from under 80 to over 110 ML/day. The project would also facilitate maintenance activities on critical infrastructure:

[19] Issued under the Water Supply (Safety and Reliability) Act.
[20] Department of Natural Resources & Mines, Queensland Dam Safety Management Guidelines, 2002.

- without the need for a compressed maintenance program or a large number of individual shutdowns and contractual arrangement with severe liquidated damages for late completion and/or bonuses for early completion (as had been used previously used to manage contractors' risk);
- using a wider selection of contractors, work methods and materials; and
- without significant operating cost or operational risk penalties.

Through the additional analysis undertaken on costs (estimated at $29,6m at August 2016), stronger documentation (the Business Case), and access to additional external reports, GAWB has demonstrated the prudency of the project and identified a need to respond to the interrupted supply risk of the Awoonga Dam. The project has also been previously accepted by the QCA as being prudent, albeit in a different concept configuration.

Efficiency

Scope of Works

GAWB has undertaken an options analysis, identifying ten options in the Business Case which were then shortlisted to two options. CDM Smith reviewed the options based on a multi-criteria analysis, assigning weightings based on Paired Comparison Analysis. GAWB has also extensively reviewed the viability of the alternative solution proposed by the QCA as more cost-effective (the pontoon pump station) and concluded that the offline storage option remains the preferred option. GAWB's concerns included the risk of maintaining and operating the QCA's preferred option during a contingency failure event, concurrent with an adverse weather event. Supporting documentation indicate that GAWB has delivered the Scoping phase of the PMF.

Additional documentation has been provided by GAWB to show the various input studies to the development of the detailed design, tendering specifications and cost analysis as required under the Planning phase leading to the final Business Case for a major project. Further GAWB has provided and extract of Board Minutes to demonstrate final Board approval for the project Implementation expenditure[21],

The documentation provided by GAWB in support of its developed scope of work, cost estimates incorporating tender responses, independent review of the reasonableness of the costs, and other supporting information, has demonstrated it has effectively complied with provisions of the PMF[22], albeit the PMF flowcharts and templates were locked down in May 2017.

Standard of Works

The Business Case provides the comprehensive list of standards that the project has been designed too and will be constructed under[23]. It also lists the Federal, State and Local Government requirements to be met for development approvals including environmental, planning & approvals and heritage authorisations.

On this basis, the standard of works is deemed efficient.

[21] [redacted]

[22] Refer to RFI0036 Offline Storage documentation.

[23] Refer GAWB, Business Case: Major Project, OP2010-035 Offline Storage and Standby Pump System, August 2016, Section 3.1, page 33.

Cost of Works

The Capex Deviation Report states that the final Project Capitalisation Amount was $34.5 million, which, following the adoption of an alternative project option, was higher by $12.6 million relative to the QCA initial allowance. This difference has primarily been driven by the change in project scope, following the prior QCA approval of an alternative option. Deliverables associated with this deviation amount are given in Section 4.2 of the Capex Deviation Report.

According to the Capex Deviation Report, IDC was assessed to be applicable based on the forecast values identified at the time of the 2015 price review and an amount of $0.55 million was included in the QCA allowance.

GAWB has considered the impact on customers to the extent that it has identified that they will also benefit from greater security of water supply and reduced risk of operational disruption. GAWB has analysed the cost of various capital expenditure options for the Pontoon Pump Station option in comparison with the Offline Storage & Repump Station option. Operating and maintenance costs were deemed similar for each option and were thus not modelled. GAWB has indicated that with mooring costs ($5m), "realistic" economic life of the pontoon pump station (25 years)[24] and the need to replace the DN770 pipeline ($30 million) being considered[25], the pontoon pump station would result in a higher price than GAWB's proposed offline storage solution.

As stated in GAWB's business case, an analysis of the costs and benefits of the proposed offline storage project from a customer perspective should include an assessment of the benefits of avoiding water supply outages. The R2a analysis found that the project would reduce expected customer outages by around one third, or approximately two days per annum. An analysis conducted by GAWB in 2014 indicated that one of its largest industrial customers would lose [redacted] from plant shutdown due to loss of water (based on the value of lost production less avoided costs).

While GAWB has demonstrated the relative costs between project options, its justification for the offline storage option would have been stronger if it had documented discussions with its large industrial customers to understand the production loss they would incur were there to be a lengthy water supply interruption. This would provide an estimate of the opportunity costs to customers to compare against the additional costs of the offline storages and repump option above the baseline pontoon costs to determine whether the price difference is an amount that customers would be willing to pay to reduce the risk of a multi-day outage. However in a more recent Board Paper[26], it was noted that "had this additional project costs been included in the 2015-20 Price Monitoring Investigation, the impact on indicative zonal prices due to these incremental project costs would have been an increase of approximately $8.65/ML (real $ 2015) which is a percentage increase of between 1.27% (at Awoonga_Toolooa) [redacted] KPMG notes these price increases are relatively small and around or lower than the current CPI inflation rate.

It should also be noted that the offline storage and repump station option will reduce supply risks and improve economic efficiency for GAWB's maintenance delivery through:

- a significant reduction in the risks of triggering opportunity costs for customers of an extended outage during future single point of failure events;

[24] Refer GAWB, Business Case: Major Project, OP2010-035 Offline Storage and Standby Pump System, August 2016, Section 1.4.3, page 28, on 25 year life adopted from CDM Smith letter dated 6 July 2016.
[25] Refer GAWB, Business Case: Major Project, OP2010-035 Offline Storage and Standby Pump System, August 2016, Section 1.4.3, page 16, on condition.
[26] GAWB, RFI0094, Board Paper extract, 18 April 2019

- provision of longer access periods for maintenance contractors in the future leading to lower maintenance costs.

On this basis, KPMG has determined that the costs of this project were efficient.

Summary findings

Based on the review of documentation provided by GAWB, the interview process, and the preceding analysis, KPMG notes that it concurs with the QCA's prior decision that the project was prudent, and recommends that the project be considered as prudent because:

- the additional independent external assessments and justifications sought by GAWB support a primary regulatory-compliance cost driver and secondary supply risk-reduction cost drivers;
- the Dam Safety Inspection time frames fall due towards the end of this regulatory period; and
- the MCA analysis and its risk assessment justify that a change of project scope from that originally considered by the QCA.

Further, that the project be considered efficient because:

- a capex adjustment is required to bring the previously approved capex plus IDC up to a level required for the storage and repump station scope of work;
- the Business Case and tendering documentation clearly define the standard of work required;
- the Board Paper extracts and the updated Business Case demonstrate a focus on identifying reasonable costs against the new scope of works for inclusion by the QCA.

Table 18 shows the total capex related to the project considered both prudent and efficient.

Table 17 : Recommended adjustment to actual capex capitalisation – Offline Storage & Repump Station ($ million nominal)

FY (*1)	2016	2017	2018	2019	2020	Total
QCA approved capex	$0	$22.51	$0	$0	$0	$22.51
GAWB capex	$0	$0	$0	$38.04	$0	$38.04
KPMG Proposed	$0	$0	$0	$38.04	$0	$38.04

*(*1) Includes actual expenditure and interest during construction.*

Sample project 2 - Accommodation project

Overview

Under the previous arrangement, GAWB staff had been spread between 147 Goondoon St and Gladstone Water Treatment Plant (GWTP) locations, approximately 5 km away. GAWB proposed to purchase new accommodation at 136 Goondoon St, sell 147 Goondoon St and decommission the temporary accommodation at the GWTP.

The accommodation at 147 Goondoon St did not meet Building Code requirements, including lack of disabled access and bathrooms, and inadequate parking. Additionally, the Queensland Government's Office Accommodation Management Framework (OAMF) sets out guidelines for accommodation for government agencies. An assessment by Flinders Group found that conditions within the 147

Goondoon St office were not consistent with the OAMF guidelines and benchmarks with the gap analysis and site assessment by Flinders Group[27] indicating the following refurbishment requirements:

- not having any expansion floor space to meet the organisations growth requirements;
- not enough car parking spaces to meet the local government regulations for the number of building occupants;
- not meeting access and mobility guidelines defined by government nor AS1428:1;
- not compliant with sustainability standards including on energy management and waste management;
- not incorporate open plan office to provide natural light and outlook; and
- no alternative work spaces or support breakout space, team working or quiet zones.

GAWB noted that, as provision of disabled access would require installation of a lift, this would be classed as a major refurbishment and would trigger the requirement for a formal building application and review for full compliance with the Building Code, as well as under the Gladstone Regional Council (GRC) Planning Scheme. This would result in significant expenditure and business disruption while works were in progress.

Previously 147 Goondoon St was too small to meet GAWB's staff accommodation requirements and fifteen staff members were housed at the GWTP in temporary dismountable accommodation. Having staff in two locations added costs to the business from frequent trips between sites, including vehicle costs and loss of productive time. Trips took approximately 15 minutes one way, and therefore significant time was lost in meeting travel time, and with the additional risk to staff safety of frequent trips between sites. There was also no space for growth or to support temporary project teams.

The purchase of 136 Goondoon Street was completed in 2015-16, with all staff being accommodated at the one location. For various reasons including a slow local market, 147 Goondoon Street has not yet been sold.

Key Assumptions and Status

Table 18: Accommodation project key assumptions and information

Information source	• Accommodation Strategy Business Case (December 2016) • GAWB Accommodation Report (26 February 2016) • Capex Deviation Report • Project Plan (April 2016) • Flinders Group: Accommodation Options Assessment (March 2014) • GAWB Minor Project Plan (refurbishment of 147 Goondoon St, March 2015)
Investment Driver	• Existing accommodation not compliant with Building Code requirements • Staff accommodated over two locations, creating costs and inefficiencies • Excess time lost in interoffice travel for meeting with increased driving safety risks • No space for growth or to support temporary project teams
Intended Outcome	Provide ongoing accommodation with: • Sufficient space to accommodate current staff (preferably at one site); and

[27] Flinders Group, Accommodation Options Assessment, GAWB, March 2014, provided within 41. 08 Item 3.3 Accommodation Strategy Business Case - Final (Consolidated docs).pdf

	• Location above 1:100 flood level
Current Project Status	The project was completed in 2015-16
Procurement and project delivery Process	• Accommodation Options Assessment by Flinders Group (March 2014) • Negotiate a purchase price for 136 Goondoon St [redacted] • [redacted] to carry out a due diligence [redacted] • Prepare draft sale contract

Options analysis

GAWB commissioned Flinders Group to undertake an options assessment of their "three shortlisted" accommodation options and prepare an Options Assessment Report (March 2014):

1. Reconfiguration and expansion of current location 147 Goondoon St (est. $2.5m);
2. Purpose-built accommodation on existing site (at GWTP) (est. $5.2m); or
3. Purpose-built accommodation on existing site (Reservoir Precinct Area) (est. $4.8m).

In May 2013, the GAWB Board agreed that the primary evaluation criteria of prospective office accommodation options should be:

- Resilience to 1:100 climatic conditions and compliance with quality, environment and safety criteria; and
- That the final proposal be robust and persuasive for the QCA endorsement and possible Ministerial approval.

Options were considered within the region such as Awoonga Dam area, Yarwun industrial estate, GSDA, Gladstone CBD, Reservoir Precinct and within existing GAWB infrastructure. At a subsequent board meeting, the above three short-listed options were approved for further investigation.

The Flinders Group report found that the existing conditions within the 147 Goondoon St office were not consistent with guidelines set out in the OAMF framework, including overall use of NLA, parking, accessibility, sustainability, office spaces and support spaces (e.g. breakout areas, quiet zones, etc.). The options assessment included capital estimates for each of the options, with Option 1 being approximately at least half as expensive as the other options.

Flinders Group noted that the design life of buildings is generally 40 years with a major refurbishment of the building around the 25-year mark. It noted that the Goondoon St building is 30 years old and part-way through refurbishment and that "[t]herefore all that remains to be done is the ablutions entry lift and inside reorganising to optimise space, introduce contemporary accommodation practices and ergonomics". The conclusions of the report, though not prescriptive, appear favourable toward Option 1.

However, since the Flinders Group options assessment, GAWB continued to experience staffing growth, while in 2016 the Gladstone region experienced an economic downturn with vacancy rates for commercial buildings in Goondoon St rising. GAWB sought to review its position in this context and identified the premises at 136 Goondoon St as representing a better accommodation solution given its greater size and car parking availability.

GAWB obtained an independent financial assessment from Donald Cants Watts Corke (DCWC) of three buildings in Gladstone CBD to satisfy growth opportunities and staff expansion:

- 147 Goondoon St (existing head office);
- 117 Goondon St (empty but needing significant refurbishment, requiring purchase); or
- 136 Goondoon St (partial fit-out with tenants on ground floor, level 4 and partially tenanted on level 1, requiring purchase).

DCWC produced a report based on its assessment of the three buildings options and concluded that the third option (136 Goondoon St) provided the best financial solution to GAWB.

On the basis of this information, GAWB undertook its own assessment, considering six options for accommodation:

1. Status quo: 147 Goondoon St with minor refurbishment (est. $1.1m[28]);
2. Redevelopment of 147 Goondoon St (est. $9.2m);
3. Purchase 117 Goondoon St and minor refurbishment of 147 Goondoon St (est. $7.0m less $0.4m, net $6.6m);
4. Purchase of 136 Goondoon St (and sale of 147 Goondoon St) ([redacted]);
5. Construction of a new building at GWTP (and sale of 147 Goondoon St)[redacted]; or
6. Construction of a new building in the Reservoir Precinct (and sale of 147 Goondoon St) [redacted]).

Each potential accommodation option was analysed against seven criteria:

1. Cost/price impact for customers;
2. Compliance with Queensland Government policy to locate in the regional centre CBD;
3. Optimal climatic resiliency;
4. Capturing productivity and organisational benefits of staff in one location;
5. Appropriate car parking for all staff;
6. Flexibility for future growth, laboratory facilities, automated control room, etc.; and
7. No significant business disruption during transition.

It was found that the purchase of 136 Goondoon St (and sale of 147 Goondoon St) was the lowest cost option to address the problem. It was also the only option that satisfied all criteria for new accommodation, had best flood resistance, and could be implemented the fastest with least disruption to the ongoing business.

GAWB has taken sufficient steps to consider all viable options, including review of its approach in view of changing circumstances. It is noted that [redacted] 147 Goondoon St[redacted] has not been realised to date. However, if this sale revenue was excluded from the options analysis, option 4 would still remain the lowest cost option.

[28] This case seems to exclude addition of opportunity costs associated with rented space and transport costs, and lost time of $4.6m which would increase the actual business costs, making net costs $5.7m

[29] [redacted].

[30] [redacted].

[31] [redacted].

Proposed Capital Expenditure

The QCA had allowed $1.7m (inc. IDC) into its price monitoring decision for the 2015-20 regulatory period, with an assumed commissioning date in the 2015-16 financial year. Subsequently, GAWB undertook additional investigations and made the decision to implement the purchase of 136 Goondoon St and the sale of 147 Goondoon St. GAWB completed the project to do minor upgrades to 136 Goondoon St and to move in. The interview discussion identified that staff efficiencies were indeed higher with all management, operations and planning staff in the one building. Some variations were required to make the building ready for occupancy in mid-2017 with a budget forecast plus variations of [redacted].

The sale of 147 Goondoon St has yet to occur, but in the future needs to progress at, at least the amount of $[confidential] agreed by the board as the floor sales amount (Board Minute No. 2017/08, page 6), and to have that disposal cash gain offset the existing capex approval.

Table 19 Actual capex capitalisation – Accommodation project ($ million, nominal)

FY	2016	2017	2018	2019	2020	Total
QCA approve capex	$1.7 (*1)	$0	$0	$0	$0	$1.7
GAWB capex (*2)	$0	[redacted]	$0	$0	$0	[redacted]
Capitalised (*3)	$0	[redacted]	$0	$0	$0	[redacted]

*(*1) Assumes retain and minor refurbishment of 147 Goondoon St, noting the opportunity costs of two offices are excluded from the analysis, but should be included.*
*(*2) Includes actual expenditure.*
*(*3) Includes actual expenditure and interest during construction.*
Source: GAWB, RFI0094 & Capex Deviation Report, and Business case, December 2016, (see 18. 08 Item 3.3 Accommodation Strategy Business Case - Attachment 1.pdf)

Assessment

Prudency

The Strategy Business Case (December 2016) notes that total accommodation space at 147 Goondoon St and GWTP are fully utilised and that staff are required to make frequent trips between the sites. GAWB estimated that consolidating staff would save 42 journeys per week, translating to a saving in staff time and vehicle costs of $53,000 p.a. or $0.4million present value over 10 years.

Additionally, discussions during the interviews with GAWB suggested that a cyclone-resistant building would allow better disaster response where all staff are in one building (note hardening of building may also be required, e.g. windows). It was noted that the 136 Goondoon St building did not suffer from any flood damage during the last cyclone.

Moreover, the accommodation at 147 Goondoon St did not meet Building Code requirements, including lack of disabled access and bathrooms, and inadequate parking.

During the initial accommodation review by Flinders Group a number of options were explored. As circumstances changed and building values in the area decreased, GAWB sought a more comprehensive options analysis by DCWC. As the status quo option was not tenable, the next lowest option was chosen and executed, being the purchase of 136 Goondoon St and sale of 147 Goondoon St.

In view of the above factors, GAWB has demonstrated prudency in progressing this project, albeit with the second highest cost from its options assessment, before adjustments which are discussed in the Efficiency section below.

Efficiency

Scope of Works

While the options assessment was underway, GAWB approved limited work to the 147 Goondoon St to proceed, namely:

- Reception upgrade;
- Level 1 upgrade to HR and IT;
- Facelift of exterior;
- Toilets and access upgrades levels 1 and 2 (only if Development Application would not be triggered).

In the Capex Deviation Report, it was stated that the objectives of the project were to find both a short-term solution and a long-term solution. In that report, it mentions that the preferred short-term solution was to make a minor upgrade to the first floor of 147 Goondoon St. While it explored a full range of accommodation options, GAWB moved to partially comply with the Building Code and the Gladstone Regional Council (GRC) Planning Scheme by proceeding with partial refurbishment of 147 Goondoon St. The board approved $1.1 million for this minor upgrade, in line with the QCA approved expenditure amount.

While in hindsight this could be considered an inefficient outcome when all accommodation options were under assessment, GAWB did not overspend the QCA allowance. In addition, curtailment of the expenditure to get 147 Goondoon St into full compliance can be seen as an efficient decision, as it was ultimately found that sale of the premises was more appropriate than full refurbishment. [redacted]

In reassessing the options analysis in the DCWC report (as above), KPMG's analysis of the status quo option shows that GAWB understated the opportunity costs of remaining at 147 Goondoon St by $4.7m. These costs should have been included to cover continuing movements between separate offices and the need for additional rental accommodation for future growth. When these opportunity costs are factored into the cost comparison, the status quo option is no longer the lowest cost option. KPMG therefore concludes the change in the scope of work is financially efficient, and better meets GAWB's accommodation requirements into the future.

Standard of Works

In accepting a number of variations on the minor adjustments to the newly purchased 136 Goondoon St and prior to moving into the premises, GAWB exercised its need to comply with the Building Code, OAMF guidelines and the GRC Planning Scheme through minor modifications to the new building. This demonstrated that it was meeting the accepted standard of works. KPMG concludes the standard of works supports an efficient project delivery.

Cost of Works

GAWB notes that in most circumstances, owning and leasing property can be considered equivalent from the perspective of NPV. By owning facilities, the owner has certainty that it can continue to use them in perpetuity, while by leasing, less capital is employed and the business can invest in more productive opportunities. However, in GAWB's case, all assets earn a regulated rate of return, including corporate accommodation, thus there is no advantage obtained by releasing capital to invest elsewhere in the business.

As GAWB's specialist facilities (SCADA and control room, emergency response, etc.) are difficult and expensive to relocate and require flood-resilient accommodation, GAWB considers that it obtains more

benefit from security of tenure than a typical occupant. Therefore, it is in GAWB's best interest to own its accommodation.

As noted above, GAWB proceeded with partial refurbishment of 147 Goondoon St while the accommodation options were still under assessment. This would have incurred additional costs but the justification for this approach in real time demonstrated efficiency through not undertaking work which would require mandatory compliance with the Building Code and GRC Planning Scheme, with an additional estimated cost of $9.2million[32] for full refurbishment less the $1.1million already spent.

The impact on customer prices for the move to 136 Goondoon St is set out in the Accommodation Strategy Business Case Board (December 2016). GAWB states that the methodology used to allocate corporate costs to customers is recommended by the QCA in 2002 and results in cost allocations to "storage", "raw delivery" and "potable delivery" based on estimates of the relative costs of servicing these customer types. The expected price impacts for hypothetical customers in 2020 of the project (compared to the status quo) are set out below.

Table 20: Accommodation impact on customer pricing

Customer	Price Impact ($/ML)	Price impact (%)
10GL Awoonga raw water	0.1	0.04%
10GL Gladstone raw water	0.4	0.06%
10GL Gladstone potable water	1.0	0.07%
10GL North Industrial raw water	0.4	0.05%
10GL North Industrial potable water	1.0	0.04%

These expected price impacts for the Accommodation project are considered to be quite low, and are well offset by the business and operational efficiencies which can be expected to be achieved in the future from staff co-location and a better working environment. On this basis the partial refurbishment of 147 Goondoon St is considered economically efficient.

However, [redacted] sale of 147 Goondoon St should not be a risk which is borne by customers in their prices during the current or future regulatory periods. This would be best achieved by subtracting the assumed sale floor price of [redacted], transaction costs in selling 147 Goondoon St of [redacted], and the estimated capital gains tax cost recovery of [redacted], from GAWB's proposed capex of [redacted], leaving a recommended allowance of [redacted] only[33].

KPMG therefore recommends the cost of works be considered efficient, [redacted].

Summary findings

Based on the review of documentation provided by GAWB, the interview process, and the preceding analysis, KPMG notes that it has retested the QCA's prior decision that the project to begin refurbishing 147 Goondoon St was prudent, and examined the prudency and efficiency of the preferred option to purchase 136 Goondoon St and sell 147 Goondoon St with partial refurbishment. Following these reviews KPMG recommends that:

- The project to partially refurbish 147 Goondoon St be considered as prudent because it was:

[32] GAWB, Accommodation Strategy Business Case, Board Paper No.2017-08-03, dated 9 December 2016, Table 1, page 9, in 41. 08 Item 3.3 Accommodation Strategy Business Case - Final (Consolidated docs).pdf.
[33] Refer GAWB, Business Case, 9 December 2016, Table 9, page 30.

- primarily relying on commencing to comply with a regulatory cost driver following the QCA's decision for 2015-20; and
- secondarily keeping open the full list of accommodation options while it developed the detailed Business Case for a business process improvement cost driver;

- The project to purchase 136 Goondoon St and sell the partially refurbished 147 Goondoon St be considered as prudent because:
  - the additional independent external assessments and justifications sought by GAWB support a detailed Business Case;
  - the need to progress an overdue accommodation improvement project in a timely manner and within the current regulatory period; and
  - the Business Case and supporting documentation confirm this option as a prudent process improvement cost driver and justify that a change of project scope from that originally considered by the QCA is reasonable.
- the project be considered efficient, [redacted], because:
  - a capex adjustment upwards is required to bring the previously approved capex plus IDC up to a level required for the purchase of 136 Goondoon St being a new scope of work;
  - the Business Case and attached documentation clearly define the standard of work required;
  - the Board Paper extracts and the updated Business Case demonstrate a focus on identifying reasonable costs of [redacted] against the new scope of works for inclusion by the QCA;
  - but that because 147 Goondoon St has not been sold [redacted], the estimated floor sales price of [redacted], transaction costs in selling 147 Goondoon St of [redacted], and the estimated capital gains tax cost recovery of [redacted], all being removed permanently from the project capex costs which otherwise enter the RAB.

Table 20 shows the total capex that we consider both prudent and efficient for this project

Table 21: Recommended adjustment to actual capex – Accommodation project ($ million nominal)

FY (*1)	2016	2017	2018	2019	2020	Total
QCA approved capex	$1.71 (*1)	$0	$0	$0	$0	$1.71
GAWB capex	$0	[redacted]	$0	$0	$0	[redacted]
KPMG Proposed	$0	[redacted]	$0	$0	$0	[redacted]

*(*1) Includes actual expenditure and interest during construction.*

Sample project 3 - Awoonga Dam VFD replacement

Overview

GAWB provides bulk treated and raw water to industries and local regional council in the Gladstone Area. The source of water supply is from Awoonga Dam located approximately 20 km from the town and the primary means of supplying water to the town is via Pumps 1 and 2 at Awoonga Dam Pump Station, in a duty/standby arrangement. The pump motors have large, high voltage Variable Frequency Drives (VFDs), which were installed together with the pumps and motors as part of the Raw Water Supply System Augmentation between 1998 and 2000, prior to the dam wall raise.

The two VFDs associated with pumps 1 and 2 at the Awoonga Dam Pump Station are nearing the end of their useful lives. They are no longer supported by the OEM, and spare parts are becoming harder to source and, where available, are typically custom-made with a lead-time of 6 months or more. The current arrangement for maintaining the electronic control system is for the service contractor to replace individual components on printed circuit boards, which is not sustainable in the longer term.

The pumps and motors were reconditioned prior to the Business Case prepared in February 2014 and are considered efficient and well-suited to GAWB's pumping requirements.

Key Assumptions and Status

Table 22 Awoonga Dam VFD replacement project key assumptions and information

Information source	• Project Justification Form (March 2012) • Options Study Report (Hatch, August 2013) • Business Case (January 2014) • Capex Deviation Report (19 October 2019)
Investment Driver	• VFDs approaching end of life • Spare parts difficult to source
Intended Outcome	• Replacement of VFDs in a cost-effective and timely manner to maintain reliability and efficiency of raw water pumping.
Current Project Status	Completed in 2015-16
Procurement and project delivery Process	• All procurement activities to be undertaken in accordance with GAWB's Procurement Policy, with additional consideration required of the QLD Government State Purchase Policy and desire to maximise local content within procurement activities • According to Business Case, procurement to be based on: o Major package of work to be formally and publicly tendered o Tenders assessed against agreed matrix of selection criteria and weightings o Formal assessment of received tenders undertaken for recommendation to GAWB Board to appointing a Principal Contractor • Preference is given to local companies for minor packages of work and an additional weighting assigned to tenders of major package of work that are to utilise local labour for non-specialised tasks, in accordance with GAWB's Local Industry Participation Plan • Major project milestone schedule: o Appointment of design consultant o Advertise tender for major package of work o Appoint principal contractor o Replace first drive o Replace second drive o Project completion

Options analysis

The Capex Deviation Report states that GAWB commissioned Hatch to undertake an Options Study Report which was delivered in delivered in May 2013[34]. The Capex Deviation Report states that the following options were identified and compared at a high level:

- Maintain on a breakdown basis;
- Perform preventative maintenance;
- Refurbish the VFD units; and
- Replace the VFD units.

The options were evaluated on the basis of feasibility and risk. The options were each denoted as either "feasible" or "not feasible".

The Business Case[35] indicates of the four considered options, only "replacement" was considered as a feasible option to reduce current perceived risks.

Additionally, a risk assessment was performed on options deemed feasible, using a risk matrix. The outcomes are shown below:

Table 23 : VFD risk assessment

Option	Credible Scenario	Likelihood	Consequence	Risk
Maintain on a breakdown basis	Simultaneous failure of both VFDs (requiring extended repair period) and then Pump 3, leading to inability to supply water for a period exceeding 24 hours	Likely (short term) to almost certain (long term)	Extreme (business disruption)	Severe
Perform preventative maintenance	Simultaneous failure of both VFDs (requiring extended repair period) and then Pump 3 leading to inability to supply water for a period exceeding 24 hours	Possible (short term) to likely (long term)	Extreme (business disruption)	Significant to severe
Replace the VFD units	Simultaneous failure of both VFDs and Pump 3 leading to inability to supply water for a period exceeding 24 hours	Rare	Extreme (business disruption)	Moderate

GAWB concluded from this process that the preferred option was to replace the VFD units and subsequently commissioned Hatch to conduct a further options study for the VFD replacement[36]. The study included:

- Condition of existing drives;
- Overview of current Medium Voltage (MV) drive technology;
- Presentation of options investigated;
- Constructability assessment;
- Vendor comparison and evaluation;
- Project execution planning including schedule and resource requirements; and
- Recommendations for new drive tender evaluation process.

[34] The following report was mentioned but not provided by GAWB, ECM_240125_v1_Awoonga Dam VFD Options Study Draft Report.pdf.
[35] Refer ECM_282331_v2_Business Case Awoonga VSD Replacement.pdf.
[36] Refer ECM_252809_v1_R3060 VFD Options Study Report Hatch.pdf.

Although the initial options assessment was not available for review to understand whether any alternatives to VFD replacement would have been viable and more desirable, GAWB has outlined the need for replacement (end-of-life, not supported by EOM, difficulty in replacing spare parts and long lead-times). This approach taken by GAWB sufficiently considered viable options for cost-effective replacement of the VFDs.

Proposed Capital Expenditure

The QCA had allowed $4.2 million (including IDC) into its price monitoring decision for the 2015-20 regulatory period, with an assumed commissioning date in the 2015-16 financial year. GAWB undertook preliminary options investigations in the prior regulatory period and then further detailed replacement options analysis early in this regulatory period. It made a decision to implement the project with a Siemens led team. Because of the onset of the cyclone season when Siemens was ready to implement the sequential shut down of two of the three pumps, a delay in installation was required to avoid the risk of a single unit failure while there was not a third back-up pump to handle pumping requirements. The project was completed and capitalised in financial year 2016-17 with a cost of $6.7m (inc IDC).

Table 24 : Actual/estimated] capex – Awoonga Dam VFD Replacement ($ million, nominal)

FY	2016	2017	2018	2019	2020	Total
QCA approve capex	$4.21 (*1)	$0	$0	$0	$0	$4.21
GAWB capex (*2)	$0	$5.86	$0	$0	$0	$5.86
Capitalised (*3)	$0	$6.66	$0	$0	$0	$6.66

*(*1) Assumes prior preparatory capex of approximately $1.5m in prior regulatory period. Note prior year's budgets on this project include $0.52m in 2013-2014 and $1.00m in 2014-2015.*
*(*2) Includes actual expenditure, delay into 2016-17 financial year to delay installation over the cyclone period.*
*(*3) Includes actual expenditure and interest during construction.*
Source: GAWB, RFI0038 & Capex Deviation Report, and Business case, February 2014, (see ECM_282331_v2_Business Case Awoonga VSD Replacement.pdf)

Assessment

Prudency

The region was deemed to be exposed to risk of disruption of water supply from the single source (Awoonga Dam). An extended interruption would mean a disruption to the heavy industrial and manufacturing industries, causing negative impacts on their operations, as well as disruption to the municipal treated water supply via the Gladstone Regional Council (GRC). KPMG notes the existence of this risk cost driver which supports the prudency of this project.

Given that the VFDs were reaching their end of life and were no longer supported by the original equipment suppliers (OEM), the case for replacement (and the timing) was justified. It is noted that Hatch's initial options study, which included a condition assessment of the VFDs, supported the appropriateness of the timing of replacement. Other documentation described higher costs for replacement components and longer delivery time frames, which supported a decision to move to a replacement project. The recommendation of that report reflects an assessment that the condition of the VFDs warranted replacement according to GAWB's selected timeline, it GAWB has taken the necessary steps to demonstrate prudency.

KPMG recommends this project be accepted by the QCA as prudent.

Efficiency

Scope of Works

A detailed options analysis process has been undertaken, including a condition assessment of the VFDs as part of the initial options study to identify means of addressing the issue of ageing equipment and a further assessment of different options for VFD replacement.

The Project Justification Form clearly sets out the project justification, duration and estimated cost of the scoping phase, including the impact on operations and strategic fit.

Additionally, the Business Case documents the scope of the VFD replacement to include:

- Replacement of the VFD units;
- Replacement and/or upgrade of the VFD room HVAC system;
- Installation of a redundant services transformer and switchgear; and
- Integration engineering and works to integrate the new equipment into the existing electrical systems and buildings.

The works were planned to be packaged and delivered as described in the below table:

Table 25 : VFD replacement Scope of Works

Scope of work	Timing	Work Package
Supply, installation and commissioning of VFDs	Changeover shutdown	Major works
Supply, installation and commissioning of auxiliary transformer	Prior to shutdown	Minor works
Supply, installation and commissioning of air-conditioning unit	Prior to shutdown	Minor works
Control system modification works	Prior to shutdown and changeover shutdown	Minor works
Integration engineering modifications	Prior to shutdown	Minor works
Update, testing and commissioning of protection settings modifications	Changeover shutdown	Minor works

The Business Case also describes the approach to scope change management. The initial stage was to gain GAWB Board Approval of the Business Case, the overall Delivery Programme and the approved budget. The major scope of work was to be publicly tendered and, if this produced a significant scope change, the relevant authorisations for the change in approved project scope would be sought and obtained prior to contract award. The Business Unit Manager acts as the decision-making authority for minor variances in scope and reports to the GAWB executive.

KPMG recommends the project be considered as efficient under a replacement cost driver, as replacement will reduce opex (both the number of outages and costs for modern-equivalent spare parts) and reduce the potential downtime on failure which would be a large cost to the business.

Standard of Works

The Hatch options analysis of June 2013 noted there were no specific Australian standards covering the VFD, but vendors indicated they manufacture their VFD to International and IEC standards. In the high-level scope of work developed by Hatch for the tender process, a range of detailed specification documents were developed as references for the vendors to produce their tenders. These in turn refer

to specific Australian and other International standards for various elements of the electrical installation that are required to be met[37].

KPMG therefore conclude that the defined standard of works in the tender demonstrates the standard of works is appropriate and support an efficient project delivery.

Cost of Works

The procurement strategy outlined in the Business Case is sufficiently directed at reducing costs where possible through formal and public tendering, while prioritising local providers for minor packages of works. GAWB sought cost estimates together with the independent options study compiled by Hatch, who also supported the development of the tender scope of work and specifications of project elements.

According to the Capex Deviation Report, the preferred option was estimated at $4.2 million in 2015-16 (with budget expenditures of $0.52 million in 2013-14 and $1.00 million in 2014-15), while the final capitalised value of the project was $6.7 million including IDC. The identified causes for the cost increase include extensions of time and storage costs due to cyclone season, extensions of time and costs to hold equipment due to snowstorms in the US, and additional assistance from Aurecon due to these extensions of time. Variations have been documented and are considered reasonable given the complexity of the project and external uncontrollable events which disrupted project delivery.

The primary element of this project was tendered, hence market tested and deemed appropriate. Smaller variations have been reviewed and they appear reasonable and in line with comparable purchases in other major electrical projects. KPMG therefore concludes that the project has been delivered in a cost effective manner and is therefore efficient.

While a key objective is to replace critical pieces of existing infrastructure to ensure demand requirements of existing and future customers can be met securely and reliably, GAWB should present a clear analysis of the impact on the customer, including cost impacts.

Summary findings

Based on the review of documentation provided by GAWB, the interview process, and the preceding analysis, KPMG notes that it concurs with the QCA's prior decision that the project was prudent, and recommends that:

- the additional independent external assessments sought by GAWB, the options analysis and its efficiency assessment justify that a change of project scope was also prudent; and
- the project has been delivered efficiently and that a capex adjustment is required to bring the previously approved capex plus IDC up to the actual capex plus IDC.

Table 25 shows the capex that is considered both prudent and efficient for this project

Table 26 : Recommended adjustment to actual capex – Awoonga Dam VFD Replacement ($ million, nominal)

FY (*1)	2016	2017	2018	2019	2020	Total
QCA approved capex	$4.21 (*1)	$0	$0	$0	$0	$4.21
GAWB capex	$0	$5.86	$0	$0	$0	$5.86
KPMG Proposed	$0	$6.66	$0	$0	$0	$6.66

*(*1) Includes actual expenditure and interest during construction.*

[37] Refer to ECM_297059_v2_000-E-SPE-0014 General Specification for HV VFD Rev C pdf.pdf

6.4 Forecast capex 2020-25

GAWB is proposing a total capitalised amount of $178.8 million over the 2020-25 regulatory period. This is $53.5 million higher than actual expenditure during the 2015-20 period, or 43% higher.

The following documents forecast capital expenditure (including IDC).

Table 27: Forecast capital expenditure 2020-25 (including IDC) ($ million, nominal)

	2020-21	2021-22	2022-23	2023-24	2024-25	Total
Forecast capital expenditure (inc IDC)	35.6	25.8	15.6	9.7	92.0	**178.7**

As demonstrated in the table above, there are material variations in the capitalisation of expenditure across the years, ranging between $9.7 million in 2023-24 and $92 million in 2024-25. This is due to the timing for commissioning of works, in particular the largest capital project (Awoonga Dam Spillway Capacity Upgrade – Stage 2 & 3 - $61 million) forecast to be commissioned in 2024-25.

The increase in capex being proposed highlights a number of things to consider in relation to GAWB's ability to deliver this program:

- Given GAWB's recent history of overspending its allowance, there may be a risk of similar cost blowouts against this new forecast program. KPMG is of the view that GAWB has not demonstrated its ability to stay within proposed capex budgets, and believes the QCA needs to encourage GAWB to justify how it will deliver this program of works efficiently.
- During the interviews GAWB indicated that the work on the Awoonga Dam spillway will need to be done by specialist contractors with experience in this activity. Further, that a number of similar capex projects were underway in NSW at present, and skilled contractors would be drawn from that activity. GAWB contends verbally that this will not draw down local contractor capacity significantly to deliver this project and therefore will not be limited in its ability to deliver the remainder of the forecast capex.
- While GAWB is currently using its PMF more rigorously, it has yet to demonstrate robust internal processes that allow for effectively managing contracts of this size/scale. GAWB needs to assure the QCA that it is capable of delivering this project successfully and on budget.

The main drivers for this increase are:

- $82.1 million in replacement investment, which is $38.2 million (or 87 per cent) higher than expended in the last regulatory period;
- $72.9 million in regulatory investment, which is $26.6 million (or 57 per cent) higher than expended in the last regulatory period;
- $18.6 million in business process improvement investment, which is $9.1 million (or 95 per cent) higher than expended in the last regulatory period.

GAWB has also forecast some small reductions in:

- $5.2 million in risk investment, which is $1.6 million (or 23 per cent) lower than expended in the last regulatory period; and
- No forecast expenditure to support capacity works, which is $18.7 million (or 100 per cent) less than expended in the last regulatory period.

The following table documents capitalised expenditure, by driver.

Table 28: Forecast capital expenditure 2020-25 (including IDC) ($ million, nominal)

Driver	2020-21	2021-22	2022-23	2023-24	2024-25	Total
Risk	2.4	0.5	0	0	2.3	5.2
Regulatory	0	0	1.3	4.2	67.3	72.9
Replacement	24.2	23.4	11.7	2.7	20.1	82.1
Business Process Improvement	9.1	1.8	2.6	2.9	2.3	18.6

6.4.1 Assessment of Deliverability

KPMG has concerns with GAWB's ability to deliver a replacement program that is almost double what it currently delivers across five years. In fact, GAWB is proposing to complete replacement works in the first two years of the next regulatory period, which is almost three times larger than the annual average completed in the current regulatory period. This raises concerns with the availability and ability for local contractors to support a trebling of work. If GAWB is required to look beyond the local market, it may have to pay a premium to bring contractors to Gladstone to complete the work.

KPMG notes in Table 30 that the replacement capex is not particularly uniform across the regulatory period. A more stable replacement capex profile should assist local contractors to maintain efficient delivery of services to GAWB and benefit the local community through continued presence regional economy.

KPMG recommends that GAWB provide to the QCA, detailed documentation of how it proposes to deliver its replacement program, prior to approving the works. This may include (for example) outcomes of market testing through an expression of interest. If GAWB cannot adequately demonstrate deliverability, the QCA may consider only approving a replacement program consistent with GAWB's current expenditure profile.

In reviewing GAWB's forecast capex for 2020-2025, KPMG has also recognised that the majority of the larger projects are only in the early Concept or Scoping phase of the PMF. For this reason the documentation available to support the project is limited, and the cost estimates are by definition within quite a large range. To assist future analysis of capex, GAWB should add two data fields to its capex project spreadsheet data base which display the PMF Risk Level and the Development Phase for each project, so that both GAWB and the QCA are able to assess what documentation from the PMF templates and external advisers, should be available to review in support of each capex project. This would also allow a more rigorous control of capex within GAWB's governance framework.

In addition, KPMG notes that in other utility sectors with similar major capex programs for delivery, there has been a propensity to expand direct employee numbers, which in hindsight are not needed in the long-run for capex and opex delivery following completion of the major program. GAWB should develop a Resource Management Plan so that it can justify its labour and contractor commitments at the next regulatory review around 2024 should an ex-post review be initiated by the QCA.

6.4.2 Review of sample projects

KPMG's broad approach, as outlined in at the beginning of this report, has provided for an initial strategic review of the robustness of the governance and planning frameworks relative to good/best practice and the prioritisation of forecast capital expenditure across key drivers.

Following the strategic review, KPMG has sampled a range of capital projects in order to test the application of GAWB's frameworks across the business. Applying the definitions and criteria outlined in the beginning of this chapter, KPMG can test each project against the identified requirements.

The choice of approach was guided by the need to ensure that the final sample is representative of the overall capital program. KPMG's preferred approach is to select major projects which reflect:

- **Capital value (size of the project)** – KPMG's selected projects ranging from $2.0 million to over $50 million. While we expect the most effort to go into the largest projects, it is prudent that we check a number of the smaller projects to ensure the same systems and processes are applied.
- **Drivers** - Each driver has a different set of factors that contribute to establishing prudency and efficiency. Further, the proportion of projects and expenditure associated with each driver in the sample should reflect a similar proportion by driver for the entire capital program.
- **Asset classes** - KPMG has sought to avoid picking too many projects of the same class, e.g. dams, reservoirs, etc.
- **Site locations** - not picking projects which are based at the same site. Once you have selected one project within a site, it is often interrelated to others and some basic information on the other projects at the site can also be assessed, thus widening the scope of the seven sample projects under review.

KPMG has also selected projects which have proposed completion dates ranging across the five year forecast period.

To complete our assessment, we have (for each project), provided:

- An overview of the scope of the project;
- Key assumptions and status of support project justification;
- A summary of the options analysis completed;
- The proposed annual capex over the ten year period; and
- Our assessment of the project against the guiding questions, including recommended variations to the proposed expenditure.

The following forecast projects have been reviewed in the following sections of this report:

- Awoonga Dam Spillway Capacity Upgrade Stages 2 & 3;
- South Gladstone Reservoir Replacement;
- Connection to GRC/Kirkwood Reservoir;
- Expansion of Boat Creek Pumping Station;
- GWTP to South Gladstone Reservoir Stage 3; and
- UV Disinfection.

Project 4 – Awoonga Dam Spillway Capacity Upgrade - Stage 2 & 3

Overview

GAWB owns and operates Awoonga Dam, located on the Boyne River approximately 26 km south of Gladstone city. The Dam supplies raw water for urban, industrial, mining and recreational uses within the Gladstone Regional Council (GRC) area. The main dam has been raised on multiple occasions. The most recent raising was in 2000-2001 when the full supply level was raised from RL 30 m to RL 40 m by raising the main dam, the addition of a concrete gravity ogee section on top of the existing concrete gravity spillway and construction of Saddle Dam No. 3 to RL 47.9 m.

Construction works were underway to raise Saddle Dam No. 3 and construct an auxiliary spillway at Saddle No. 6. The project at that stage comprised the following structures:

- Concrete-faced rockfill main dam with a maximum height of approximately 55 m noting that the upper 11 m of the upstream facing is steel fibre-reinforced shotcrete;
- Full supply level of RL 40 m;
- Ungated spillway with a concrete gravity crest structure;
- Saddle Dam No. 3 on the left bank of the dam and spillway which has a crest level of RL 47.9 m and was being raised to a crest level of RL 52.9 m; and
- An auxiliary spillway under construction at Saddle No. 6 with a crest level of RL 50.75 m and a width at the control section of 235 m.

A GHD report states that during the 2013 flood event, damage was sustained in the vicinity of the dam and spillway. GHD found that, given the magnitude of the event, the damage sustained was not unexpected and generally considered that the spillway performed well. Following the 2013 flood event, the following repair works were undertaken:

- Placement of anchored fibre-reinforced shotcrete to the eroded areas at the end of the concrete apron at the toe of the spillway structure to protect against undermining of the toe of the spillway.
- Placement of anchored fibre-reinforced shotcrete protection over a joint in the cut rock slope on the right side of the discharge channel immediately downstream of the spillway structure.
- Repair of the erosion protection around the spillway bridge abutments.

GHD drew several conclusions with respect to the likely performance of the spillway during flood events of greater magnitude than the January 2013 event, including:

- Relatively small flood events are likely to erode the loose gravel and cobble material which was pushed back into the eroded areas following the January 2013 flood event.
- Further erosion of sheared zones is likely even up to distances in excess of 100 m downstream from the toe of the spillway structure during extreme flood events.
- Further cavitation damage is likely on the apron slab immediately downstream of the dissipater teeth during flood events of a similar or greater magnitude than the 2013 event.

[redacted] through GHD's studies for GAWB regarding anchoring of the spillway and the spillway slabs, potential deficiencies were identified with the anchoring for the required 2025 and 2035 flood immunity requirements under Queensland Guidelines on Acceptable Flood Capacity for Water Dams.

Key Assumptions and Status

Table 29 AD Spillway Capacity Upgrade - Stage 2 & 3 project key assumptions and information

Information source	• Awoonga Dam Hazard and Consequence Assessment Report for GAWB, (Connell Wagner, 30 May 2008) • Information Notice changing Safety Conditions for Awoonga Dam #0211 (Director, Dam Safety, Water Supply, Delegate CEO of Office of Water Supply Regulator, DERM, 3 Dec 2009) and specifically Condition DS 16 attached) • GHD report on hydraulics and CFD analysis (GHD, 2015 a&b) • GHD concept design (GHD, 2018 & SK021 & SK022) • GHD Awoonga Dam Assessment of Spillway Chute Slabs and Anchors (GHD, Jan 2018, is a critical report for support of the project) • Spillway Upgrade and Strengthening Cost Estimate Report (WTP, September 2018) • Peer review to assess whether costs are reasonable (Entura, March 2019) • Ordinary Board Meeting Paper (22 July 2019) • Email exchange dated 19/12/2019, Awoonga Dam Spillway Chute Upgrade – Review of project by the QCA Consultant, between R.Fowden, Chief Engineer, Dam Safety, DNRME and B.Van Blerk, Engineer, GAWB
Investment Driver	• Regulatory - To meet the Queensland Guidelines on Acceptable Flood Capacity
Intended Outcome	• To strengthen the existing spillway
Current Project Status	• Passed Gateway 2 – In early Concept phase of Options Design & Selection
Procurement and project delivery Process	• Investigations into anchoring of the spillway and spillway slabs • Isolate options and assess against flood capacity requirements • Seek design and cost estimate for spillway upgrade • Peer review of upgrade design and cost estimate

Options analysis

A file note from GAWB[38] to this capex review indicates that the AD Spillway Capacity Upgrade project has not yet progressed into the Concept phase of work, which leads to full options analysis and costings for a Business Case. While there are a number of reports informing the potential risks to be addressed by the design options, consensus on the design elements, their scope and potential costs have not yet been determined. Additionally, starting from the assumption that an upgrade is required, GAWB will need to undertake further preliminary work studies on this project to advance it through the Project Management Framework (PMF).

Given that the project has not yet reached Scoping phase, the absence of a full options analysis appears appropriate and in line with GAWB's internal PMF.

Guidelines on Acceptable Flood Capacity for Water Dams

The Guidelines relate to the ability of water dams to be able to safely discharge an acceptable flood capacity (AFC) and specify the minimum required AFC that all proposed and existing referable dams in Queensland must be able to safely pass. For dams which are not referable, the guidelines are advisory. According to Section 341 of the Water Supply (Safety and Reliability) Act 2008, a dam is a referable dam if a failure impact assessment states that the dam has a Category 1 or Category 2 failure impact

[38] Refer to: File Note - Concept stage projects.pdf (11 November 2019).

rating, and the Chief Executive of the relevant Department (being the Department of Environment and Resource Management at the time), accepts the assessment.

A failure impact assessment of the dam (i.e. a consequence or hazard assessment used to establish whether there are people whose safety will be at risk in the event of a dam failure)39. A study by Connell Wagner in May 200840 has provided justification that the Awoonga Dam has a Category 2 failure impact rating, and the Information Notice from the Dam Safety Regulator changing Safety Conditions for Awoonga Dam #021141 dated 3 December 2009 imposes the condition that the Awoonga Dam meets the Condition 16 AFC requirements.

Therefore the Awoonga Dam is accepted as meeting the criteria for a referable dam to which the Guidelines apply., and GAWB must seek to meet the conditions of Condition 16 relating to upgrades to meet minimum AFC requirements. These are discussed further in the section below.

While GHD's findings from its report on the Awoonga Dam Spillway Stability Assessment included that the proposed upgrade to install anchors at the spillway could be deferred until 2035. This resulted from its analysis of load case 4, which was the analysis for 65% of the AFC under the 2013 Guidelines, was shown to be stable. However, the Information Notice from the Dam Safety Regulator has made the 2025 time frame for compliance mandatory.

Upgrade Schedules

The Guidelines present three methods for assessing AFC for referable dams:

- Small dams standard;
- Fall-back option; and
- Risk assessment procedure, incorporating the 'as low as reasonably practicable' (ALARP) principle.

The small dams standard allows owners of small earth dams to quickly assess spillway adequacy and is essentially a simplified fall-back method.

The fall-back option is intended for larger dams where the cost of undertaking a full risk assessment is not warranted when weighed against the potential benefits.

The risk assessment procedure is based on the ANCOLD risk assessment process and is consistent with the framework of the national standard AS/NZS 4360:2004 Risk Management. This type of assessment should be adopted for major dams. The risk assessment procedure provides the owner with a review of the adequacy of the dam under all load conditions and failure scenarios, not just flood loadings.

In previous versions of the Guidelines, a single upgrade schedule is applied regardless of the method used to assess the adequacy of the spillway. Separate upgrade schedules or requirements are introduced into the current Guidelines for the different methods of assessing AFC for referable dams.

The programming of any necessary dam safety upgrade works is to take into account factors such as the time necessary to complete the work before the due date and the time of year available to undertake the work so as to minimise any additional risk to those living downstream.

The schedule for dam safety upgrades that applies to existing dams assessed using the small dams standard or the fall-back option is presented below:

---

[39] Guideline for failure impact assessment of water dams, Queensland Government (November 2018).
[40] Connell Wagner, Awoonga Dam Hazard and Consequence Assessment Report for GAWB, 30 May 2008.
[41] Director, Dam Safety, Water Supply, Delegate CEO of Office of Water Supply Regulator, DERM, Information Notice changing Safety Conditions for Awoonga Dam #0211, 3 Dec 2009.

Table 30 Dam safety upgrades schedule for existing dams assessed using the small dams standard or the fall-back option[42]

Tranche	Required minimum flood discharge capacity	Date by which the required minimum flood capacity is to be in place for the existing dams
1	25 per cent of the AFC or with at least 1:2,000 AEP for erod ble dam embankments (whichever is the bigger flood)	1 October 2015
2	65 per cent of AFC	1 October 2025
3	100 per cent of AFC	1 October 2035

By contrast, no definitive schedule is provided for dam upgrades based on risk assessment approaches, due to the amount of interpretation and assumptions required for risk assessment. However, the general aim of all dam upgrades based on the risk assessment approach is to ensure all required safety upgrades are complete by not later than 1 October 2035.

Recent correspondence between GAWB and the Dam Safety regulator at DNRME indicates that the "finding that CFD modelling has shown that the lower spillway slabs are inadequate to pass even 65% AFC and suggests that it is unlikely that a decision would be made by the Dam Safety Regulator to delay the upgrade post-2025."[43]

Proposed Capital Expenditure

The Spillway Upgrade Capacity project represents a complex design which has been prepared by GHD, costed by Water Treatment Plant (WTP) and peer reviewed by Entura, who are independent companies with the expertise to assist GAWB in the project options identification and design, and costing within the Concept phase of the PMF.

WTP estimates the cost of the project at $44.55million in July 2018 dollars[44], and without IDC or escalations. Additional data supplied by GAWB indicates that the project capitalisation amount will be $60.69 million including IDC and escalations.

Table 31: Estimated capex – AD Spillway Capacity Upgrade ($ million, nominal)

FY	2021	2022	2023	2024	2025	Total
GAWB capex	$0	$0	$0	$0	$48.20	$48.20
Capitalised *	$0	$0	$0	$0	$60.69	$60.69

** includes actual expenditure and interest during construction estimate*

Assessment

Prudency

Driver

The criteria for prudency requires GAWB to first assess if there is a valid cost driver that needs to be addressed by the capex investment. GAWB has indicated that the cost driver is regulatory and related to the Queensland Guidelines on Acceptable Flood Capacity (AFC) for Water Dams ("the Guidelines").

[42] Guidelines on Acceptable Flood Capacity for Water Dams, Queensland Department of Energy and Water Supply (July 2017).
[43] GAWB, DNRME email dated 12 December 2019.
[44] WTC Partnership, Awoonga Dam Upgrade and Strengthening, Cost Estimate Report, September 2018, page 1.

As discussed above, the Guidelines must be met by a dam owner of a referrable dam to which the Guidelines apply. GAWB has also provided that it should adopt a higher safety standard by assessing the damage seen on the Awoonga Dam from the 2013 cyclone event.

GHD was engaged by GAWB in 2015 to undertake an assessment of the hydraulic performance of the spillway during rare and extreme flood events. The assessment was triggered by the significant flooding and consequent erosion damage experienced in January 2013 at Awoonga Dam as a result of tropical cyclone Oswald. Key aims of the assessment were to:

- Review erosion in the spillway channel downstream of the spillway structure, particularly with reference to the erosion which occurred during the January 2013 event; and
- Review of the effectiveness of the spillway in dissipating energy, the performance of the hydraulic jump, the potential for generation of waves and consideration of downstream impacts.

GHD concluded, amongst other things, that relatively small flood events are likely to further erode sheared zones even up to distances in excess of 100 m downstream from the toe of the spillway structure during extreme flood events. It also found that further cavitation damage is likely on the apron slab immediately downstream of the dissipater teeth during flood events of a similar or greater magnitude than the 2013 event.

These concerns are seen by GAWB to highlight the need to comply with the time frames in Condition 16 of the Dam Safety Regulator's Information Notice and the safety standards under the Guidelines, and hence provide the regulatory driver for this project. GAWB has demonstrated that the risks of failure support the need to deliver this project.

KPMG believes GAWB has identified a prudency cost driver for this project.

Timing

In GAWB's Board Paper of 22 July 2019, GHD identified these potential deficiencies with the anchoring of the spillway. GAWB has used this concern to suggest the deadlines for voluntary minimum flood level capacity requirements should be applied to Awoonga Dam, and therefore the spillway slab upgrade is required to meet the 2025 and 2035 flood immunity requirements under the Guidelines.

GAWB has clearly demonstrated that the Awoonga Dam should be assessed using the small dams standard or the fall-back option, which would thereby make it subject to the 2025 due date. GAWB sought clarification from the Dam Safety Regulator on whether the 2025 time frame was fixed for Awoonga Dam. It is fixed unless a risk assessment acceptable to the Dam Safety Regulator suggests more time is reasonable, up to 2035. In its response to GAWB, the Dam Safety Regulator makes the following comments:

> "As the QCA consultant has identified, Section 4.2 of the AFC guidelines specifies that "*The general aim of all dam upgrades based on risk assessment approaches is to ensure all required dam safety upgrades are completed by not later than 1 October 2035*". Please note that this is the ultimate date for the dam to be updated to 100 percent of AFC, not the deadline. The actual date and any staging of upgrade would need to be negotiated with the regulator following completion and acceptance of the risk assessment. The finding that CFD modelling has shown that the lower spillway slabs are inadequate to pass even 65% AFC suggests that it is unlikely that a decision would be made to delay the upgrade post-2025. Additionally, since GAWB only owns one referable dam, as opposed to a portfolio of dams, there would be no option to justify delaying the upgrade on a prioritisation basis."[45]

Based on this information, KPMG considers the timing of the upgrades to meet the 2025 requirements is prudent.

[45] Email from the Queensland Dam Safety Regulator to GAWB, 19 December 2019.

Documentation

A failure impact assessment of the dam has been provided as part of the documentation supplied along with notification of regulatory conditions with which GAWB must comply, therefore it has been established that the Awoonga Dam is a referable dam to which the Guidelines apply.

GAWB has also supplied documentation that directly ties its findings of potential deficiencies of the anchoring with the relevant aspects of the Guidelines.

There are also a number of reports exploring the reasons for the need of an upgrade to the spillway of the Awoonga Dam, and while the analysis is in the early Concept phase of project development the documentation is sufficient to support prudency.

Conclusion on prudency

Noting the above, KPMG recommends the QCA consider that this project is prudent for the 2020-2025 regulatory period.

Efficiency

Scope of Works

The peer review raised concerns over the clarity of GHD's computational fluid dynamics (CFD) results, as well as insufficiency of information in the reports to be able to assess the validity of the design. It also found the slab anchoring design to be prima facie (in the absence of sufficient information) excessively conservative. The peer review identified concerns with over-design and that costs for the support of drilling across the top of the spillway were likely inadequate, recommending that flow-test modelling be undertaken to verify the CFD analysis.

As discussed above, at this stage GAWB has neither presented a clear options assessment nor developed a Business Case. This is in line with the early pre-Concept phase of the project development. The peer review conducted by Entura identified multiple concerns which will need to be addressed as the Concept phase progresses, including:

- Slab anchoring: A basis of design will be required so it will be possible to tell if design intent has been achieved. Additionally, Entura considers the design to be excessively conservative based on well-performing designs from elsewhere, and therefore the progression of spillway modelling (as accepted in the 22 July 2019 board paper) appears justified to find a least cost design option.
- Aerator slot: A basis of design will be required so it is will be possible to tell whether the design intent has been achieved. The cause of erosion damage (previously repaired) is also questioned and should be carefully reconsidered to ensure the correct problem is being addressed in this design element.
- Crest anchoring: Entura states that the decision to anchor the spillway crest needs to be challenged to ensure that the correct solution is being adopted. Entura notes that the spillway crest is only unstable in overturning for the extreme load case, principally due to the presence of high uplift pressures under the left abutment blocks. Further Entura suggests it is important to consider whether alternate means of stabilisation, for example drilling additional foundation drains to relieve the excess pressures, would be more cost effective.

Entura notes that it would be prudent to have an allowance for environmental management of the site as the concrete demolition, drilling, grouting and concreting operations all potentially generate waste that will need to be contained and prevented from entering the waterway.

As there are potential increases and reductions in cost estimates, there is added uncertainty to the accuracy of the cost estimates proposed. On this basis, the scope of works needs further development but at the present level of project development is considered provisionally efficient.

Standard of Works

Once the project develops to a point where a scope of work for tendering purposes has being developed, the relevant ANCOLD, Australian Standards that relate to dam design and construction, and GAWB's detailed works specifications will need to be referenced. Given the early stage of the project, these have been provided as generic documents which support a potentially efficient outcome.

Cost of Works

WT Partnership (WTP) was commissioned by GHD to provide a construction cost estimate for a proposed upgrade and strengthening of the Awoonga Dam Spillway. WTP responded with an estimate of $40.55million in June 2018 dollars excluding escalation and IDC for:

- Spillway crest anchoring with 14 No. 22 strand post tensioned anchors, installed to a depth of 53 m below the existing spillway.
- A new chute aerator slab anchored with 8 m passive rock bolts.
- A new lower chute concrete overlay and anchoring with passive rock bolts.

This cost estimate is based on the documentation on the early stage of concept design, which does not yet look at options to meet a stated basis of design. It is noted that the view formed by Entura is that the cost estimate contains the key elements to implement the design as shown in the sketches. However, a concern raised by Entura is that it does not allow enough for access to undertake the work on top of the spillway safely nor for environmental management.

No analysis of impact on the customer, including cost impacts, has been presented, albeit GAWB has indicated that the customer price impacts are best assessed collectively due to the combined nature of the capex costs into the single price uplift at the commencement of the 2020-25 regulatory period.

On this basis KPMG recommends that the cost analysis is at a reasonable accuracy level to support an efficient project outcome, given the early stage of the project development in the PMF process.

Summary findings

Based on the review of documentation provided by GAWB, the interview process, and the preceding analysis, KPMG recommends that:

- the AD Spillway Capacity Upgrade project be considered prudent by the QCA, as it has demonstrated a robust cost driver, the need for works to be completed prior to 2025, but recognising documentation of a robust options analysis which would settle a clear scope of work for efficiency analysis will be developed once a robust design basis has been established for the Concept phase analysis.
- the project cost as estimated is as efficient as is currently possible and likely on the low side, as:
    - The full scope of work identified in a robust design basis has not yet been identified; and
    - The outputs from the Entura review indicate the cost estimates completed by GHD may be missing some design and construction elements and the underlying scope of works adopted is not yet complete.

Table 31 shows that KPMG has recommended inclusion of all capex proposed by GAWB for this project. The rigorous implementation of the PMF process will ensure efficient cost outcomes as the scope of works is more clearly defined through the Planning phase of the PMF.

Table 32 : Recommended adjustment to forecast capex Awoonga Dam Spillway Upgrade ($ million, nominal)

FY	2021	2022	2023	2024	2025	Total
GAWB capex *	$0	$0	$0	$0	$60.69	$60.69
KPMG Proposed *	$0	$0	$0	$0	$60.69	$60.69
KPMG Proposed adjustment *	$0	$0	$0	$0	$0	$0

** includes actual expenditure and interest during construction estimate*

Project 5 - South Gladstone Reservoir Replacement

Overview

GAWB owns and operates the South Gladstone Reservoir, which is the sole supply to GRC reservoirs and residents in the South Gladstone area. The reservoir was constructed in 1946 with a storage capacity of 9 ML. The reservoir is a concrete post tensioned type reservoir with a steel framed sheeted roof and associated pipework. It has a defective floor joint, identified by Aqualift in 2007, thus a monitoring program was put in place for periodic inspections by external structural engineers with maintenance carried out to the accessible external components to maintain operational performance.

Due to operational constraints and the pipework configuration, the Reservoir cannot be isolated, fully drained and cleaned, restricting the ability to undertake internal inspections to assess the structural integrity of the internal components. Since 2007, six external inspections have been carried out and concrete damage has been identified.

In late 2018, GAWB commissioned GHD to update its existing 2015-2019 strategic network review report. The 2020-2024 report developed a strategic upgrade summary, including work priority lists and associated high-level cost estimates.

The report found that the South Gladstone Reservoir had adequate capacity for current water demands and operational requirements. The conclusions to the report was that the South Gladstone Reservoir needed "structural repairs (OPEX and CAPEX)" but also stated that "no reservoir replacements are recommended in the 2020-25 period"[46].

GAWB engaged GHD to undertake a scoping study to assess potential upgrades to the reservoir to meet future demand based on current growth rates. This study indicated "GAWB has restrictions regarding the shutdown of the South Gladstone Reservoir with the total offline time which is limited to 1 hour. The offline time determined by the demand generated by GRC reservoirs and the reticulation networks requiring the full volume of the South Gladstone Reservoir to act as a balance tank."[47]

GHD conducted a risk assessment of the reservoir and concluded that the reservoir could either remain online until the end of its design life in 2026 (with planning and construction commencing immediately to ensure delivery of replacement storage by 2026) or refurbishment of the reservoir, requiring it to be taken offline. Such a refurbishment could extend the life of the reservoir by 20 to 30 years.

The options were investigated, and a cost estimate was prepared for each. Each option was then assessed by MCA and it was concluded that the preferred option was to construct a new reservoir, "based on significant opex and asset longevity risk of remediation of the existing reservoir".

[46] GHD, Strategic Network Review 2020-2024, January 2019, Section 7.2, page 89.
[47] GHD, Scoping Study, September 2019, Section 3.1, page 15.

Key Assumptions and Status

Table 33 South Gladstone Reservoir Replacement project key assumptions and information

Information source	• Project Justification and Plan (July 2019) • South Gladstone Reservoir Scoping Study Report (GHD, September 2019) • Strategic Network Review 2020-2024 Treated and Raw Water Pipelines (GHD, 1 January 2019)
Investment Driver	• End of life replacement • Meet contractual supply arrangements with industrial and domestic customers • Reduce the risk profile of the South Gladstone storage and treated water network
Intended Outcome	• Continue to meet GAWB's potable water network design objectives e.g. max. 6 to 8-hour network interruptions • Continue to meet the requirement for supplying 24-hour demand in the South Gladstone treated water network • Provide redundancy in the South Gladstone treated water network for planned maintenance activities in the South Gladstone Reservoir
Current Project Status	• Passed Gateway 2 – In mid Concept phase post Options Study and now moving to Site Selection and Concept Design
Procurement and project delivery Process	• Detailed inspection and condition assessment; • Review of South Gladstone Reservoir capacity and pipework arrangement including future demand requirements; • Options study; • Cost estimate (+/-30%, capex & opex); • Methodology to address issues including options for supply to allow the reservoir to be taken offline.

Options analysis

GHD proposed two options for comparison for the potential upgrade of GAWB's South Gladstone Reservoir.

Option 1: Refurbishment

This option involved refurbishment of the existing 9.1ML reservoir whilst providing temporary storage of ML to allow for the refurbishment works to be undertaken without interruption to the dependent reservoirs and reticulation system. It was proposed to use 4.5ML galvanised tanks for temporary storage due to their well-understood construction methodology, construction time and reusability. It was noted that due to the inability to inspect the lower two metres and the floor of the reservoir, the exact scope of works for refurbishment of the reservoir is uncertain. In order for the reservoir to be rehabilitated, the reservoir would need to be taken offline for two to three months. The +/-50 per cent cost estimate for this option (including 20 per cent contingency) was $7.86 million (excluding IDC).

Option 2: Replacement

This option involved "like-for-like" replacement including all ancillaries and included consideration of site selection, extent of earthworks, new reservoir construction methods and connections to existing pipework. The +/-50 per cent cost estimate for this option (including 20 per cent contingency) was $9.40 million (excluding IDC).

Following a risk assessment and development of the two options, GHD performed an MCA and determined that the preferred option was to replace, rather than refurbish, the reservoir. While

refurbishment may extend the life of the reservoir by 20 to 30 years, this would incur significant additional opex and disruption during refurbishment. Furthermore, due to the inability to inspect the lower 2 metres, the extent of required remediation and the remaining design life of the reservoir cannot be fully assessed until temporary storage is constructed. Given the criticality of the reservoir, GAWB discounted the viability of refurbishing the old reservoir.

Proposed Capital Expenditure

GAWB has progressed an Options Study with GHD and their report dated September 2019 reviewed two primary options of a) reservoir refurbishment (est. $7.86million exc IDC) and b) reservoir replacement (est. $9.40million exc IDC). The Multi Criteria Analysis (MCA) analysis however, indicates that the replacement option is preferred primarily due to the additional life available from a new reservoir (for an incremental additional cost), and the risk of unknown degradation below the silting layer in the existing old reservoir, meaning the old tank may not be able to be refurbished to provide the required services, once the temporary reservoir is built and the existing old reservoir emptied for full inspection.

Table 34 : Estimated capex – South Gladstone Reservoir Replacement ($ million, nominal)

FY	2016	2017	2018	2019	2020	Total
GAWB capex	$0	$0	$0	$0	$10.57	$10.57
Capitalised*	$0	$0	$0	$0	$11.55	$11.55

** includes actual expenditure and interest during construction.*
Source: RFI0121A Attachment A IDC Response to KPMG's Working Draft Report (Full List of Projects).xlsx.

Assessment

Prudency

The documentation supports replacement as the primary cost driver because:

- The reservoir will reach the end of design life in 2026; and
- Six external investigations have been carried out identifying concrete damage in accessible areas which has been repaired.

The documentation identifies the risk of failure as the secondary cost driver because:

- The condition of the reservoir's lower 2 metres of inner wall and the floor cannot be accessed for condition based maintenance due to sediment build-up and turbidity during visual inspection attempts; and
- Independent MCA has identified that the prime concerns are service continuity through regular inspection and maintenance and the resulting uncertainty for asset longevity.

Therefore the project has been demonstrated to address the concerns over the condition of the reservoir as it meets the cost driver criteria for prudency. The timing of the project is determined by the concern that the reservoir is reaching the end of its serviceable life and a solution to continuance of the service delivery will be required by 2024. The documentation is reasonable and robust.

KPMG therefore recommends the project be included in the capex forecasts as prudent, as it meets the criteria for prudency.

Efficiency

Scope of Works

The options analysis developed by GHD examines the two most likely options for progression of the project. The scope of works for GAWB's preferred option for replacement of the reservoir is clearly laid out in the Project Justification and Plan dated July 2019, with a work schedule for the completing the Scoping phase and undertaking the Planning phase from July 2020 to June 2021 and is detailed below:

1. Detailed inspection and condition assessment (completed);
2. Review of South Gladstone Reservoir capacity and pipework arrangement including future demand requirements;
3. Options study (completed by GHD);
4. Cost estimate (+/-30%, capex & opex);
5. Methodology to address issues including options for supply to allow the reservoir to be taken offline.

KPMG recommends that the options analysis is reasonable and allows the inclusion of the project into the capex forecast.

The Concept phase of the project can now progress to detailed concept design, leading to a Business Case to proceed through the next gateway to fund the Planning phase including geotechnical studies; environmental, planning and heritage assessments; and development and drafting of the tender documentation.

Standard of Works

At this early point in the Scoping phase of project development design standards are not defined for the specific project option chosen. Matters of safety for construction and for end users is assessed in the MCA analysis. GAWB has works specifications which cite required Australian and international standards, and GAWB specifications for infrastructure, construction and operability. Following a request for additional information, GAWB has provided its specification documentations used in its normal tendering processes. These documents comprehensively defined the standard of works required.

KPMG recommends that the standard of works is adequately defined for the project.

Cost of Works

Cost estimates have been provided for the two options in the Scoping Study prepared by GHD. Appendices D and E of the report give a breakdown of the cost estimates which are stated to be typically developed on extrapolation of recent similar project pricing, budget quotes for some equipment items, industry unit rates and GHD experience.

The costings for these two options are (Sept 2019 $, accuracy +/-20%, excluding 20% contingency):

- Option 1 : refurbish the existing reservoir using two smaller temporary storage tanks to provide service continuity, and extend service life to between 20 to 30 years, albeit with a continuing opex requirement : $7.86 million (exc IDC)
- Option 2 : build a new reservoir and then demolish the old one, providing a 50 year service life and lower opex requirement : $9.40 million (exc IDC)

GAWB has identified the Option 2 as the preferred project to take into the Planning phase. While this is more expensive it is accepted based on risk reduction and service life, as seen in GHD's MCA analysis.

Summary findings

Based on the review of documentation provided by GAWB, the interview process, and the preceding analysis, KPMG recommends that the South Gladstone Reservoir Replacement project:

- be considered as prudent by the QCA; and
- be considered efficient, because:

- the lowest cost option has been selected;

- visibility of GAWB's IDC analysis has been provided; and

- The QCA adopt capex estimate provided by GAWB.

Table 36 shows the adjustment recommended to the capex proposed by GAWB for this project.

Table 35: Recommended adjustment to forecast capex – South Gladstone Reservoir Replacement ($ million, nominal)

FY	2021	2022	2023	2024	2025	Total
GAWB capex *	$0	$0	$0	$0	$11.55	$11.55
KPMG Proposed *	$0	$0	$0	$0	$11.55	$11.55
KPMG Proposed adjustment *	$0	$0	$0	$0	$0	$0

** includes actual expenditure and interest during construction estimate*

Project 6 – Connection to GRC/Kirkwood Reservoir

Overview

The South Gladstone Reservoir supplies treated water to the Calliope Booster Pump Station which boosts the flow to the GRC Mount Elizabeth Reservoir, which in turn feeds the GRC Silverdale Reservoir under gravity. The GRC Silverdale Reservoir can be supplied under gravity from South Gladstone Reservoir if the Calliope Booster Pump Station is bypassed. The pipeline from South Gladstone Reservoir to Calliope Booster Pump Station is a 375 Asbestos Cement (AC) pipeline.

GAWB states that the Booster Pump Station is approaching its end of life. The pipework around the pump is corroding and it is thought that this corrosion has been accelerated due to the chlorine injection system at the pump station and occasional chlorine spills. Due to the configuration of the pipework, it cannot be replaced without demolishing the pump station.

Additionally, in January 2017, GRC submitted a connection request for the new GRC 11 ML Kirkwood Reservoir, which was constructed in 2018. Due to the design level of the Kirkwood Reservoir, a booster pump station is required to boost the flow into the new reservoir from the line feeding Calliope Booster Pump Station from South Gladstone Reservoir. Gravity flow is not possible due to the elevations of the reservoirs and pipework arrangements.

Key Assumptions and Status

Table 36 Connection to GRC/Kirkwood Reservoir project key assumptions and information

Source	• RFI0043 Project Plan 2017 (GAWB, 7 February 2017) • RFI0043 Kirkwood Booster Pump Station Cost Estimate (GHD, 8 September 2017) • RFI0043 4220113 Var 3 Rev SoW Kirkwood (GHD, 9 December 2018) • RFI0043 IPD2017-030 Business Case Variation 001 Signed (GAWB, 30 November 2018) • RFI0043 Stg 3 Memo & EA (GAWB, 4 July 2018) • RFI0039-40 Proposed Capex 2020-25, file RFI 39-40 Capex Forecast 2020-2025.xlsx
Investment Driver	• Capacity – GRC requested connection to Kirkwood Reservoir
Intended Outcome	• To be able to connect to and successfully deliver potable water to both the new Kirkwood Reservoir and the Mt Elizabeth reservoir

Current Project Status	• Passed Gateway 2 – In later Concept phase post Options Study, Site Selection and Concept Design, moving to Detailed Design and Tender Documentation. Through access has been leased for the duration of the construction period.
Procurement and project delivery Process	• The project process was halted while GRC reviewed its supply forecasts and updated its connection inquiry details.

Options analysis

Four options were examined by GAWB[48] as follows:

1. Connect the new GRC Kirkwood reservoir with the existing infrastructure;
2. Upgrade the Calliope Booster Pump station and lay dedicated pipeline to Kirkwood reservoir;
3. Upgrade the Calliope Booster Pump station and construct a new smaller Kirkwood Booster Pump station; and
4. A new Booster Pump station at Kirkwood.

GAWB developed initial cost estimates on these options. Of these Option 1 will not work as the top water level of the new Kirkwood reservoir is above the bottom feed of the South Gladstone reservoir supply point, so the reservoir will not fill completely using gravity feed. Option 2 requires 10km of new pipe at total capex of $5.75 million ($2017, excluding IDC) and $5,000 per annum opex and limited future capacity available at Calliope Booster Pump station. Option 3 requires capex of $1.75 million ($2017, excluding IDC) and $60,000 per annum opex with upgrade to Calliope and new Kirkwood Booster Pumps. Option 4 requires capex of $1.2 million ($2017, excluding IDC) and net zero opex once existing Calliope Booster Pump station is decommissioned[49]. Note these capex costs are direct costs only and exclude the usual indirect costs such as procurement, engineering and project management costs, and project additions where applicable for growth allowance (5 per cent), contingency (30 per cent), and escalation (2.5 per cent per annum). However, Option 4 provides the lowest costs for the stated concept design basis.

GHD was asked to provide a detailed estimate of the direct and indirect costs plus 30 per cent contingency for Option 4. GHD's +/-50 per cent cost estimate was $5.88 million (at September 2017, excluding GST, three year's escalation to commissioning and IDC). Applying GAWB's escalation indicates a cost estimate of $6.36 million pre IDC. KPMG has identified GAWB has used $7.06million as its capitalised amount in 2020-2021[50].

GAWB is pursuing Option 4 and is in the process of updating its detailed design, cost estimates and tendering documentation prior to the implementation gateway. It has taken these early cost estimates into its detailed project costing spreadsheet under the PMF, as is applicable for the Planning phase.

Estimated costs have changed because:

- GRC has changed its forecast need for water supply volume (from a starting average flow of 43 litres/sec to an ultimate flow of 136 litres/sec);
- GRC's slow response to lock down this critical design element has introduced a time lag since the original estimates were made in early 2017;
- GHD has undertaken a more rigorous cost estimate in September 2019 than was possible by GAWB in February 2017; and

[48] GAWB, Project Plan, IPD2017-030 Connection to GRC / Kirkwood Reservoir, 07 February 2017.
[49] Refer to IPD2017-030 Project Plan - Fully Signed.PDF.
[50] Refer RFI0121A Attachment A IDC Response to KPMG's Working Draft Report (Full List of Projects).xlsx.

- GRC has better information on design constraints including the water hammer studies undertaken by GHD.

GHD has undertaken initial concept and preliminary design studies and GAWB was responsible for land lease negotiations. An updated options analysis on infrastructure sizing and hydraulic design matters is included in the detailed design contract awarded to GHD and updated in December 2018. Therefore efficient costs within the Option 4 solution should appear in the eventual Business Case for the implementation gateway.

GAWB has supplied its detailed capex estimation tool under the PMF. This cost estimate for all costs was $7.32 million (including 30 per cent contingency, but excluding IDC)[51]. KPMG has identified this estimation tool is more rigorous than has been available under prior governance arrangements, but as this number has not yet been embedded in the Business Case for the Implementation phase, this number will not be considered GAWB's preferred cost.

Proposed Capital Expenditure

The project is advancing through the Scoping phase and requires the following:

Table 37: Estimated capex – Connection of GRC Kirkwood Reservoir ($ million, nominal)

FY	2021	2022	2023	2024	2025	Total
GAWB capex	$6.36	$0	$0	$0	$0	$6.36
Capitalised*	$7.06	$0	$0	$0	$0	$7.06

** includes actual expenditure and interest during construction*
Source: 4220113 Kirkwood Booster Pump Station Cost Estimate.PDF, and RFI0121A Attachment A IDC Response to KPMG's Working Draft Report (Full List of Projects).xlsx.

Assessment

Prudency

The project has been justified by GAWB on the following basis:

- The Booster Pump Station is approaching its end of life;
- The pipework around the pump is corroding;
- In January 2017, GRC submitted a connection request for the new GRC 11 ML Kirkwood Reservoir. Due to the design level of the Kirkwood Reservoir, a booster pump station is required to boost the flow into the new reservoir from the line feeding Calliope Booster Pump Station from South Gladstone Reservoir.

The primary cost driver is capacity through GRC's request for a new connection, although end-of-life replacement is also an identified driver. The timing is considered reasonable given GRC's original request for commissioning was January 2018, but following delays on its own part the project is now moving through the Scoping phase, with commissioning projected for 2020-2021. The documentation is above average for the Scoping phase, and moving towards additional documentation for the Planning phase.

On the basis that all tests are met, KPMG recommend this project is prudent.

[51] Refer IPD2017-030 Budget File Rev A 180329.XLS.

Efficiency

Scope of Works

The selected option was the lowest capex option on a like-for-like basis at the options study. The solution had the advantage of not triggering additional net opex once the new Kirkwood Booster Pump has been installed and running and the Calliope Booster Pump has been withdrawn from service. The scope of work was therefore working towards the lowest cost option without excessive additional opex. The scope of works has been defined sufficiently for GHD to have quoted design services to progress the detailed design, so KPMG believe this efficiency criteria has been met.

Standard of Works

At this early Scoping phase in the project development design standards are usually not defined against the required Australian and international standards. Following a request for additional information, GAWB has provided its specification documentations used in its normal tendering processes. These documents comprehensively defined the standard of works required[52], so KPMG believe this efficiency criteria has been met.

Cost of Works

GAWB has sought external cost estimates from GHD, and commenced a more comprehensive analysis using its PMF estimation tool. This has identified an estimate of $7.05 million including IDC which is proposed by GAWB for the capex for this project. As this is based on a good understanding of a detailed design basis which once fully developed will be used as a tender reference design, KPMG consider this cost estimate is efficient.

Base on the above analysis, KPMG believe the proposed capex is efficient.

Summary findings

Based on the review of documentation provided by GAWB, the interview process, and the preceding analysis, KPMG recommends that:

- the Connection of GRC Kirkwood Reservoir project be considered as prudent by the QCA; and
- the project cost is efficient, because GAWB has:
  - Demonstrated that the scope of works is based on the lowest cost option and has been updated in detail;
  - Documented the appropriate standard of works for the estimated capex; and
  - Demonstrated that the detailed cost estimate proposed is on the lowest cost option and has been updated in detail.

As such, KPMG proposes that the QCA approve the estimate for Option 4, as summarised below.

Table 38: Recommended adjustment to forecast capex – Connection to GRC Kirkwood Reservoir ($ million nominal)

FY	2021	2022	2023	2024	2025	Total
GAWB capex *	$6.36	$0	$0	$0	$0	$6.36
KPMG Proposed *	$7.06	$0	$0	$0	$0	$7.06
KPMG Proposed adjustment *	$0	$0	$0	$0	$0	$0

** includes actual expenditure and interest during construction*

[52] Refer to RFI0094 supporting documents.

Project 7 – Expansion of Boat Creek Pumping Station

Overview

GAWB sources raw water from Awoonga Dam and distributes it to the network to supply various industrial customers. The raw water supply to the northern precinct including Yarwun Water Treatment Plant (YWTP) is via the DN 900 Mt Miller Pipeline. To ensure that supply to the northern precinct has suitable redundancy in case of failure of the DN900 supply, backup water supply for the northern precinct is provided by the Boat Creek Raw Water Reservoir and Pump Station. Furthermore, the Reservoir is an offline storage dam and can boost pressure in the system via the pumps in the case that the hydraulic grade is reduced from the supply from Mt Miller.

The objective of the project is to establish full redundancy in the northern precinct by increasing storage in the Boat Creek Raw Water Reservoir to full 24 hour storage. An effective capacity of 24 hours average day demand is desirable for planned maintenance works and as a contingent supply in the event of upstream infrastructure failure. The 24 hours target allows maintenance and repairs to be undertaken, including pipeline isolation/de-isolation, draining/re-filling tasks, in a controlled manner and without risk of supply failure.

The project drivers are to undertake risk reduction and provide improvements in capacity and general business functions and operations. The project will ensure the following:

- an acceptable standard of service is maintained for the northern supply area should there be any failures of the Awoonga supply from the south;
- maintaining corporate responsibility and the reputation of GAWB; and
- regulatory requirements (DNRME) for safety of the operations and the maintenance of the infrastructure.

In mid-2019 GAWB engaged AECOM to prepare a business case for the project identifying the need for the project, the options and their comparative advantages and disadvantages and the estimated costs to deliver.

A preferred option comprising new pumps and storage lagoon was recommended with a delivery timeframe of two years and an initial estimate of $6.63million including IDC.

Key Assumptions and Status

Table 39 Expansion of Boat Creek Pumping project key assumptions and information

Information source	• Business Case: Boat Creek Expansion (AECOM, September 2019) • Expenditure Authorisation Expansion of Boat Creek Raw Water Supply (August 2019) • QCA Project Estimates 2014/15 – Boat Creek Reservoir (Aurecon, January 2014)
Investment Driver	• Risk mitigation – primary • Capacity - secondary • Regulatory obligation – tertiary
Intended Outcome	To establish full redundancy in the northern precinct by increasing storage in the Boat Creek Raw Water Reservoir to full 24 hour storage
Current Project Status	Gate 2 – Scoping
Procurement and project delivery Process	Scoping of the project has been completed. It is proposed that the project is delivered in a traditional design-bid-build approach.

Options analysis

AECOM developed and assessed six options to address the identified project need in its September 2019 report[53]. The options could generally be categorised as:

- New storage with additional pump capacity in three alternative arrangements; or
- Expand existing storage with additional pump capacity in three alternative arrangements.

The options were as below:

- Option 1a – Additional Storage Lagoon, new Duty/Standby 470L/s - The option considers the land to the north of the existing pump station or south of the existing storage lagoon to be utilised for a new independent storage lagoon to supply new larger pumps together with the existing pumps. The maximum delivery flow rate would be the contracted average daily flow.
- Option 1b – Additional Storage Lagoon, new Duty/Duty/Duty/Standby 367L/s - The contracted average daily volume is achieved by two duty pumps. The third pump allows for any peak flow attenuation should flow requirements exceed 1000L/s.
- Option 1c – Additional Storage Lagoon, new Duty/Duty/Standby 595L/s - The contracted average daily volume is achieved by one duty pump. The second pump allows for any peak flow attenuation should flows exceed 1000L/s.
- Option 2a – Increase Volume of Existing Storage, new Duty/Standby 470L/s - This option has a similar pumping regime to Option 1a except that the existing storage lagoon would be extended to meet the required volume of 51.4ML.
- Option 2b – Increase Volume of Existing Storage, new Duty/Duty/Duty/Standby 367L/s - The same pump regime as Option 1b and the existing storage lagoon would be extended to meet the required volume of 51.4ML.
- Option 2c – Increase Volume of Existing Storage, new Duty/Duty/Standby 595L/s - The same pump regime as Option 1c and the existing storage lagoon would be extended to meet the required volume of 51.4ML.

The estimated capital and operating costs for each of the options are given in Table 41.

Table 40 Estimated Capital and Operating Costs: Project 7 – Boat Creek Pumping Station Expansion

Option	Capital Costs ($)*	Operating Costs ($pa)
1a	3,754,000	78,000
1b	5,068,000	106,000
1c	4,317,000	90,000
2a	4,926,000	103,000
2b	6,650,000	139,000
2c	5,665,000	118,000

**The capital cost figures do not include the contingency (30 per cent), procurement (3 per cent), engineering (8 per cent) and project management (5 per cent) costs, as proposed by AECOM.*

The option to construct a new lagoon storage is an added option from the initial work undertaken by Aurecon in 2014 which only considered expansion of the existing reservoir.

[53] AECOM, Business Case, Boat Creek Expansion, 27 September 2019.

An MCA was performed and determined that the preferred option was to construct a new storage rather than expand the existing storage. The MCA[54] considered:

- capital costs,
- operating costs,
- operational considerations – complexity, ease of maintenance, operator safety and environment,
- technical capability – redundancy, efficiency and expandability,
- constructability – ease of implementation, space requirements, installation timeframes.

The highest scoring option (and lowest cost option) from the MCA was Option 1a. The options were then further subjected to a risk assessment. The key risks identified and used for assessment are presented in Table 42[55].

Table 41 Key risks for the project options and the proposed strategies to manage them should they arise

Risk	Risk Area(s)	Strategy
Potential for supply failure to occur while pump station and raw water reservoir are being upgraded.	WH&S, Operations, Financial, Stakeholder	Limit shutdowns of the whole plant to short periods and outside of peak supply periods.
Availability of land for new infrastructure.	Financial, Environmental, Stakeholder	Engagement with DTMR to be conducted early in the design process to assess possible land access arrangements.
Capacity of the power network for the upgrade may require Ergon line upgrades and new transformer.	Financial Stakeholder	Early engagement with Ergon in the design process to understand timeframes.
The construction of the lagoon requires significant excavation of materials that will be spoil, costs of transporting the spoil to landfill are prohibitive. It has been assumed that the spoil can be spread on site.	Financial Stakeholder	If onsite spoil spreading is not possible or limited, then discussions with GRC are required to confirm rate for disposal at landfill can be reduced.

From the risk assessment, Option 1 was rated as low or medium for each of the categories and had the lowest risk profile, whereas Option 2 had higher risks. There was minimal difference between the sub-options a, b and c.

As Option 1a scored the highest in economic efficiency and had the lowest attributed risk score, it was recommended to take forward.

KPMG notes the MCA analysis was run with a capex weighting of 0%, "as directed by GAWB". This in effect lumps opex and capex together into the one cost basket, as indicated in AECOM's 2019 report, but does not distort the cost ranking identified. While the capex and opex suggest a lower overall project cost, a full NPV analysis on a like-for-like basis on the options analysis outcomes would be instructive.

Proposed Capital Expenditure

The business case developed for the project identified the capital cost of the project to be $5.5 million which compared with capitalisation submission of $6.63 million (including IDC). It has been advised by

[54] GAWB Business Case – Boat Creek Expansion – Draft Report.pdf
[55] GAWB Business Case – Boat Creek Expansion – Draft Report.pdf, Section 4.1. It is to be noted this source document, which was used to obtain the information in Table 18, contained many digital errors. Therefore, it is somewhat difficult to interpret the information contained in Table 18, and in other parts of the source document.

GAWB that the difference of approximately $1.1 million is due to escalations relating to time between the estimates and the commissioning date to capex of $6.21 million, excluding 7% IDC.

Table 42: Estimated capex – Expansion of Boat Creek Pumping ($ million, nominal)

FY	2021	2022	2023	2024	2025	Total
GAWB capex	$0	$0	$0	$0	$6.21	$6.21
Capitalised*	$0	$0	$0	$0	$6.63	$6.63

** includes actual expenditure and interest during construction*
Source : RFI0121A Attachment A IDC Response to KPMG's Working Draft Report (Full List of Projects).xlsx

Assessment

Prudency

GAWB have demonstrated through the business case and supporting documents the need and driver for the project, being necessary risk mitigation for the supply of water to customers in the event of a failure elsewhere in the system. The project provides 24-hours of water storage which is considered to be reasonable and appropriate to meet service commitments by GAWB given the customers do not have onsite storage. The options assessment is robust and demonstrates a sufficient justification for the project and the proposed approach.

The project schedule appears reasonable, with approximately 12 months from commencement of construction to completion.

However, KPMG considers the business case provides insufficient justification for having this project proceed in the 2020-2025 regulatory period, where both reservoir capacity and pump capacity are expanded. This finding is based on the following:

a) GAWB has not indicated whether the contracted demand has increased to the average 595L/s and peak at 1,100L/s between 2014 and 2019, or remains as was in 2014 where pump capacity of 250L/s was considered sufficient. Without this being identified, KPMG must assume the existing pump capacity was and remains sufficient and is BAU, and the full contracted amounts have not been covered by the offline Boat Creek Reservoir and its existing pumps to date.

b) GAWB has not provided reasons for why contracted amounts need to be fully covered now, if they were not covered fully previously. No information has been provided that demonstrate changes in relation to expected failure modes, time off-line or anything else that would necessitate the increase in capacity now.

c) As noted above, GAWB's objective for the project is "to establish full redundancy in northern precinct by increasing storage in the Boat Creek Raw Water Reservoir to full 24 hour storage of average day demand and increasing both the reservoir and pump capacity to be able to deliver the average demand back into the network". This means that, if there is a failure in the existing primary delivery pipelines and pumps, the Boat Creek Reservoir takes over fully for 24 hours. GAWB has not provided information on the likelihood of the failure such that Boat Creek must now cover the full water delivery for 24 hours at the average load expected. It is unclear if, or how, this has been handled to date and whether the options considered in the business case are the only solutions to such a catastrophic failure (or sequences of failures).

KPMG considers better justification is required on the timing of the project to proceed within the 2020-2025 period, and therefore recommends the project be considered as not prudent in coming regulatory period.

Efficiency

Scope of Works

The recommended option is estimated by AECOM to have the lowest capital and operating costs and least project risk in terms of technical, environmental, safety, and stakeholders.

The MCA weightings used to identify the preferred option have been developed specifically for this options evaluation. For this project, the MCA weighting for capital cost was 0%. Operating cost (derived from capital cost) was weighted, with a weighting of 18%. As a result the economic criteria received the equal lowest weighting (with constructability). On this project, this approach to the MCA doesn't alter the selection of the most efficient option, but a standardised approach to conducting MCA's using NPV analysis should be implemented to ensure consistent decision making and demonstration of economic efficiency in project selection.

The proposed scope of works if considered efficient

Standard of Works

There is limited detail provided on the technical solution at this early Scoping phase of project development, although the consideration of general construction issues identify the primary risks. The preliminary design information would indicate that the proposed option will meet the required standards and typical design and construction approaches for this infrastructure, but this will need to be fully developed during the latter scoping and later Planning phase.

Cost of Works

The cost estimates for the preferred option by AECOM look reasonable and work up as follows:

- Direct capex at $3.75 million;
- Plus contingency (30%), procurement (3%), engineering (8%) and project management (5%) costs;
- Plus escalation of 2.5% pa for 5 years;
- Equals $5.9 million;
- Plus IDC at approximately 7%;
- Equals $6.63 million as proposed by GAWB.

The proposed cost estimates for the work have been developed to the extent required for the Scoping phase of the project and further design and refinement will be required with progression to the Planning phase alongside detailed design. The estimates are current to 2019 and justification and breakdown of the costs has been provided with the business case which has been drafted to move to the Planning phase.

KPMG are satisfied the cost estimates are reasonable for the Scoping phase of project development.

Summary findings

Based on the preceding analysis, GAWB:

- Has demonstrated the need for the project through a risk mitigation, which also provides for additional system capacity to supply water in the event of a network outage;
- Has not justified the timing of the works and the requirement for this to occur in the schedule proposed;
- Has provided the design basis for the options listed including nomination of a preferred option which is demonstrated to be the most efficient;
- Has provided sufficient supporting justification for the project including business case, options development and preliminary design for the preferred option.

However, because GAWB has not justified the timing and need for the project to proceed in the 2020-2025 regulatory period, KPMG recommend this project be considered as not prudent, and propose to adjust the capital expenditure for this project to zero but allow early expenditure to further assess and develop documentation on the project.

Table 43: Recommended adjustment to forecast capex Boat Creek Expansion ($ million nominal)

FY	2021	2022	2023	2024	2025	Total
GAWB capex *	$0	$0	$0	$0	$6.63	$6.63
KPMG Proposed *	$0.1	$0	$0	$0	$0	$0.10
KPMG Proposed adjustment *	$0.1	$0	$0	$0	($6.53)	($6.53)

** includes actual expenditure and interest during construction*

Project 8 – Calliope River Bridge AC Main Replacement

Overview

GAWB supplies raw water to the industrial areas to the north of Gladstone via a DN375 Asbestos Cement (AC) pipeline which crosses the Calliope and Anabranch Bridges. The pipeline is approximately 38 years old and is currently being repurposed to supply potable water from Yarwun Water Treatment Plant (WTP) to Yarwun and surrounding areas. GAWB has raised concerns with the remaining design life of the existing AC pipes due to exposure to UV, coal dust, salt water and weather conditions as well as safety concerns with maintenance along the bridges. On inspection asbestos fibres are apparent on the outside of the pipe. A condition assessment was undertaken by Aurecon and in its January 2017 report it recommended replacement with cement-lined mild-steel pipe, with estimated cost of $1.70 million excluding IDC.

In February 2017, GAWB commissioned GHD to investigate options associated with extending the life of the existing pipe or replacement to continue a reliable water supply to Yarwun and the Northern area. GHD developed a number of options to increase the design life of the AC pipe considering painting, coating and wrapping as well as replacement options for the pipeline being a new mild steel pipe attached to the bridge or a new directional drilled HDPE pipeline. GHD also undertook a multicriteria analysis considering capital costs, maintenance, health safety and environment, and other non-price criteria.

A more detailed cost assessment of the installation of the mild steel pipeline was undertaken by Aurecon in January 2017.

[redacted]

Key Assumptions and Status

Table 44 Calliope River Bridge AC Main Replacement project key assumptions and information

Information source	• RFI0045 – Calliope Anabranch AC Pipe Replacement Options: Options Report (GHD, February 2017) • RFI0045 - Calliope River Bridge and Anabranch Bridge: AC pipe replacement (Aurecon, January 2017)
Investment Driver	Not specifically stated. Expected to be classed as Replacement
Intended Outcome	Replacement of existing AC pipe due to perceived poor condition

Current Project Status	Gate 1 – Concept
Procurement and project delivery Process	Not stated.

Options analysis

An options analysis has been undertaken by GHD in February 2017 considering the options for replacement of the AC pipe. The options considered include:

- External spray/paint coating of the pipe to extend its useful life ($1.02 million excluding IDC, GHD source);
- External wrapping of the pipe to extend its useful life ($1.06 million excluding IDC, GHD source);
- Replacement of the AC pipe with a directionally drilled HDPE pipeline (not attached to the bridge, $1.27million excluding IDC, GHD source February 2017, but detailed quote of $3.17 million excluding IDC, Prizm source September 2019); and
- In situ replacement of the AC pipe with a mild steel cement lined pipe ($1.49 million, GHD source).

The options analysis undertaken by GHD in 2017 was based on the assumption of providing a 70-year asset life, and considering the periodic maintenance and/or replacement of the various options over that time.

The options analysis assumes the pipe requires replacement in the short term and does not require additional capacity for growth. The GHD NPV analysis indicated that the directional drilling option provided the lowest life-cycle cost for replacement. However, the wrapping option provided a short-term solution within both the remaining expected life of the existing pipeline and allowing for certainty in design alignment [redacted].

A subsequent directional drilling estimate by Prizm suggested a doubling of the capex required for directional drilling.

An MCA has not been completed to date on the project.

Replacement of the AC pipe with a directionally drilled HDPE pipe has been nominated by GAWB as the preferred option on the basis of lowest NPV (including the assumptions as listed above). This approach also simplifies the construction risks related to the other options which require specialist scaffolding, working at heights and above water, and working in off-peak traffic periods to accommodate large traffic flows without detour options.

Proposed Capital Expenditure

GAWB have proposed a capital cost of $4.31 million with an initial contingency of 30%, and the project to be commissioned in 2022[56]. The capital cost has been estimated based on initial engineering estimates developed by GHD for the various options and the nominated preferred option of the HDPE pipeline.

[56] GAWB, RFI0094, Comments on Initial Draft Findings, Part1, Nov 2019.

Table 45: Estimated capex – Calliope River Bridge AC Main Replacement ($ million, nominal)

FY	2021	2022	2023	2024	2025	Total
GAWB capex	$0	$4.12	$0	$0	$0	$4.12
Capitalised*	$0	$4.31	$0	$0	$0	$4.31

** includes actual expenditure and interest during construction*
Source: RFI0121A Attachment A IDC Response to KPMG's Working Draft Report (Full List of Projects).xlsx

Assessment

Prudency

The project looked initially at both the Anabranch and Calliope Bridge pipeline crossings. The Anabranch Bridge crossing was forecast in 2019 to be completed in 2020 for forecast spend of $0.85 million including IDC. KPMG recommends the QCA request additional information on this initial replacement project, including project phase status, detailed design and tendering documentation and business case.

GAWB has provided the initial GHD 2017 conceptual and options analysis report which appear to be informed by an underlying assumption of poor condition of the existing pipeline. It is understood from GAWB that the replacement of the Anabranch section has already been installed due to poor condition of the pipe and water leaks. It does not appear however that GAWB has conducted detailed condition assessments on the Calliope pipeline, noting the GHD's 2017 report states the pipeline is currently in good condition and is only approximately 38 years old.

The needs and driver for the project have not been sufficiently demonstrated. Further, the reasoning for aiming to achieving a further 70-year life of the pipeline appears to be based on the HDPE replacement option and is not likely compatible with the analysis of options for works on the bridge supported existing pipeline. [redacted]

Given the lack of defined need, assessment of current condition and therefore a clearly defined project driver, this project is not considered prudent investment. In addition, the timing has not been adequately justified in the documentation presented for review, and is subject to change.

Efficiency

Scope of Works

The scope of works for each of the options has been developed for the Scoping phase level of analysis, with a preferred option being nominated for the Calliope Bridge. The scope of works is subject to change [redacted] post detailed condition assessment of the AC pipeline. Additional options analysis is required to progress a planning gateway decision business case.

Standard of Works

The Standard of Works cannot be assessed at this time given that design has not progressed beyond preliminary design and further development of the options and design will need to be undertaken to proceed with the project beyond the Scoping phase.

Cost of Works

The proposed expenditure is based on 2017 GHD estimates and updated to 2019 dollars with the Prizm estimate. The costs have been developed from preliminary designs however the latest forecast capex for the project at $3.9 million including IDC rising to $4.12 million with adjustment for time to

commissioning, being significantly in excess of the original estimates developed by GHD at $1.27 million excluding IDC, for the preferred HDPE pipeline replacement using directional drilling.

GAWB has not justified that the option identified as the lowest NPV.

Therefore, KPMG recommend the project be considered inefficient by the QCA until such time GAWB settles the option timing and cost estimates and re-does the options analysis with better information.

Summary findings

Based on the preceding analysis, GAWB:

- Has not established the prudency of the project: the need and driver of the project have not been sufficiently demonstrated or considered the interactions with anticipated future bridge works;
- Has not justified the forecast capex with options considered on a like-for-like basis, which would then demonstrate the preferred economically efficient option to include in a business case to move into the Planning phase.

Given this, KPMG recommend the majority of the capital expenditure be removed from this period by leaving an allowance of expenditure in 2020-2021 to undertake detailed condition assessment of the AC pipeline [redacted]

Table 46: Recommended adjustment to forecast capex - Calliope River Bridge AC Main Replacement ($ million nominal)

FY	2021	2022	2023	2024	2025	Total
GAWB capex *	$0	$4.31	$0	$0	$0	$4.31
KPMG Proposed *	$0.2	$0	$0	$0	$0	$0.2
KPMG Proposed adjustment *	$0.2	($4.31)	$0	$0	$0	($4.11)

** includes actual expenditure and interest during construction*

Project 9 – GWTP to South Gladstone Reservoir Stage 3

Overview

The GWTP to South Gladstone Pipeline is a trunk main carrying treated water from the Gladstone Water Treatment Plant (GWTP) high lift system. From the South Gladstone Reservoir, treated water is transported to reservoirs at Boyne Island, Goolegumma, and Mt Elizabeth. These reservoirs supply towns and localities of Awoonga, Benaraby, Beecher, Boyne Island, Calliope, Pikes Crossing Rd, Tannum Sands, and Wurdong. It is a critical pipeline asset distributing between 45% and 50% of all treated water produced by GAWB.

This pipeline has previously had a major failure in 2012 which prompted a range of investigations and inspections into the full length of the pipeline. The section of pipe which experienced the failure, approximately 800 metres, was replaced in 2012 (Stage 1). This include physical inspections in 2013 which indicated corrosion and deterioration across much of the remaining length of the original pipeline.

Following further strategic assessment undertaken by GHD in 2014, it was recommended that the pipeline be replaced due to its criticality to the system and the observed poor condition of the pipe. Stage 2 of the replacement was undertaken in 2017/18. The capital project being reviewed is Stage 3 and comprises the replacement of another approximately 850 metres. This project has previously been included in the GAWBs 2015 Price Monitoring Investigation, and the QCA accepted this Stage 3 project as prudent with an approved capex of $3.20 million with commissioning date in 2019.

Key Assumptions and Status

Table 47 GWTP to South Gladstone Reservoir Stage 3 project key assumptions and information

Information source	• RFI0046 – Business Case – South Gladstone Pipeline Stage 3 • RFI0046 – GHD, GAWB Strategic Network Review 2020-2024
Investment Driver	• End of life replacement – Primary driver • Risk mitigation – Secondary driver
Intended Outcome	The objective of the Project is to replace the remaining section of the DN 600 pipeline that has reached the end of its service life. The replacement pipeline will allow a reliable treated water supply to be maintained to a population of at least 16,000 people.
Current Project Status	Gateway 2 – Scoping Business Case
Procurement and project delivery Process	Detailed design and planning followed by construction managed by GAWB.

Options analysis

GAWB has developed a large number of options for the replacement of the pipeline over the period of investigation. It is noted the original options analysis and the NPVs were undertaken in 2012. These were considered for the design and construction of Stages 1 and 2. The list of options previously considered is listed and GAWB considered a new option (7) was developed for Stage 3:

- Option 1: Do nothing and repair as required;
- Option 2: Cathodic corrosion protection;
- Option 3: Continuous or regular monitoring (leak detection);
- Option 4: System pressure reduction;
- Option 5: Replace the pipeline in the current alignment;
- Option 6: Replace the pipeline in a parallel alignment;
- Option 7: Option 5 or 6 above but in split stages; and
- Option 8: New pipeline in a completely new alignment.

Options 2, 4, 5 & 8 were discounted and considered to be infeasible on technical evaluation. Options 1, 3, 6 and 7 were evaluated in detail, with Option 6 being nominated as the preferred option, which was implemented for the earlier stages of the project.

The NPV for each of the options was assessed, with the following results:

- Option 1: Do nothing (run to fail) – ($98,223)
- Option 3: Continuous or regular monitoring (leak detection) – ($401,261)
- Option 6: Replace the pipeline in a parallel arrangement – ($1,737,669)
- Option 7: Option above but in split stages (2 stages) – ($1,839,494).

This pipeline is a single point of failure which feeds "Gladstone's Southern region including Boyne Island, Tannum Sands, Calliope, Wurdong and Golegumma areas. The pipeline also back-feeds to Curtis Island and the Yarwun Interconnection. It is vital that the construction disturbance be reduced as much as possible. The duplication of the pipe allows the pipe to be trenched and the connection points to be commissioned within 8 hours "spanner time" shutdown period while maintaining a 2/3 full reservoir." [57] This highlights the criticality of the pipeline and the need to continue replacement of the remaining Stage 3, as the condition assessment indicates it is at end of life.

[57] GHD, Strategic Network Review 2020-2024, February 2019, page 8.

A risk assessment was also developed for the four shortlisted options. Option 1 & 2 were eliminated on a risk assessment in the business case as the repair downtime was unacceptable to GAWB on a customer service basis. These options were also not recommended in the GHD report due to adverse customer impact. It was noted that Option 6 provided the optimal solution against Option 7 through a lower cost, for the two options which reduced the risks associated with a major failure and outage of the pipeline.

The 2019 GHD report commissioned by GAWB also re-estimated the costs of replacement of Stage 3, using LMCP and PMF principles which were not in place or active use during the 2015 regulatory review and approval by the QCA. The GHD study estimate indicated a project capex of $2.85million, excluding the IDC.

Proposed Capital Expenditure

Cost estimates for the project were developed in 2019, with a detailed business case outlining the project having been developed in September 2019.

The estimated cost for the project is $2.85 million with a contingency of approximately 10 per cent. This compares closely to initial budget estimate for this phase of $3.12 million included in GAWBs 2015 Price Monitoring Investigation which was approved by the QCA. The costs have also been estimated based on the experience on Stages 1 and 2 which were both delivered on or under budget. Capex escalated to commissioning date are now $3.72 million.

Table 48: Estimated capex – GWTP to South Gladstone Reservoir Stage 3 ($ million, nominal)

FY	2021	2022	2023	2024	2025	Total
GAWB capex	$3.72	$0	$0	$0	$0	$3.72
Capitalised*	$4.02	$0	$0	$0	$0	$4.02

** includes actual expenditure and interest during construction*
Source: RFI0121A Attachment A IDC Response to KPMG's Working Draft Report (Full List of Projects).xlsx.

Assessment

Prudency

GAWB has demonstrated the prudency of this project, due to independent advice from GHD that the asset is in poor condition and requires replacing. The primary cost driver is replacement, with a secondary driver of risk reduction.

This project was also included in GAWB's 2015 Pricing Monitoring Investigation and was approved as part of the overall forecast capital expenditure for 2015-2020. The timing of Implementation phase is appropriate as the project has been spread in three stages across three regulatory periods, with commissioning forecast in 2020-2021.

The documentation is appropriate for the stage of the project development.

KPMG has assessed this Stage 3 investment as prudent, particularly with the updated business case and cost estimate.

Efficiency

Scope of Works

GAWB has completed a detailed business case for the project Planning phase, but the detailed design and tendering package are still under development. However, the preferred option is for the replacement with the same diameter pipeline as Stages 1 & 2, having assessed the future capacity needs of customers who are supplied from this water main.

Therefore, the scope of work is deemed efficient.

Standard of Works

The detailed design has not been assessed for the standards being applied. However, it is noted that this project will be constructed similar to Stages 1 and 2. Give Stage 3 follows Stages 1 & 2 it is expected that future design work would follow the normal water industry standard guidelines. Therefore development of tendering document incorporating these guidelines with GAWB construction standards is deemed to provide for an efficient outcome.

Cost of Works

The proposed cost estimates for this project have been developed to a high level of detail and have demonstrated a saving from the initial estimate of approximately $300,000. Further, GAWB has demonstrated delivery of the first two stages of this pipeline on or under budget, with learnings from these findings informing the Stage 3 business case. The cost of works are considered to be well justified for the Scoping phase and are considered efficient.

It is noted the $2.85 million including contingency, allowances and escalation without IDC has been escalated to $3.72 million capex, and to $4.02 million with 8% IDC in GAWB's forecast capex spreadsheet.

Therefore the current estimate of $4.02 million is justified and KPMG believe this estimate to be efficient.

Summary findings

Based on the preceding analysis, GAWB:

- Has demonstrated the prudency of the works, the need and project drivers, having considered a range of options and delivered the first two stages, and timing is appropriate;
- Is working towards the detailed scope of works and cost of works from tendering to follow and inform the detailed business case and completion of the detailed design, leading to an Implementation phase gateway decision; and
- Has demonstrated the capex is efficient.

We consider this project to be prudent and efficient and we recommend the QCA accept GAWB's proposed capex.

Table 49: Recommended adjustment to forecast capex - GWTP to South Gladstone Reservoir Stage 3 ($ million nominal)

FY	2021	2022	2023	2024	2025	Total
GAWB capex *	$4.02	$0	$0	$0	$0	$4.02
KPMG Proposed *	$4.02	$0	$0	$0	$0	$4.02
KPMG Proposed adjustment *	$0	$0	$0	$0	$0	$0

** includes actual expenditure and interest during construction*
Source: RFI0121A Attachment A IDC Response to KPMG's Working Draft Report (Full List of Projects).xlsx.

Project 10 – UV Disinfection

Overview

Gladstone Area Water Board operate two Water Treatment Plants (WTPs) which provide drinking water to their customers. These are Gladstone WTP producing approximately 50 ML/D, and Yarwun WTP producing approximately 5 ML/D of drinking water. These WTPs utilise typical water treatment

processes to treat raw water from Lake Awoonga and Boyne's River, including chlorination for disinfection.

It's been identified by GAWB that additional disinfection may be required to reduce the risk of protozoan pathogens, namely Cryptosporidium and Giardia. Chlorine is ineffective to remove or inactivate these pathogens and must be removed by filtration and/or other means.

There is currently no legislation or regulation on assessing or implementing risk-based approaches to Cryptosporidium removal, with the National Health and Medical Research Council (NHMRC), overseeing body of the Australian Drinking Water Guidelines, consulting on Health Based Targets for pathogen removal in 2016. The Water Services Association of Australia, the peak industry body representing the urban water industry, has developed a manual for the application of health-based targets for drinking water safety which provide a framework for a risk-based approach to Cryptosporidium removal.

GAWB engaged GHD to undertake a risk assessment and develop concept designs for the implementation of UV disinfection treatment at the Gladstone and Yarwun WTPs. The risk assessment was based on the framework from WSAA's Manual with GAWB's raw water supplies categorised as Category 4, or the highest risk source waters for microbial contamination. The categorisation the raw water sources was on the basis of activities in the catchment area.

Based on the categorisation, a target log reduction value (LRV) of 5.5 has been nominated comprising at least two treatment barriers. The existing treatment processes at Gladstone and Yarwun provide partial achievement of the required LRVs, but have been identified to fall short of the 5.5 LRV target by 2.5 units.

Subsequently, GAWB has proposed to install UV treatment, achieving 3.0-log reduction at the Gladstone and Yarwun WTPs to achieve a total of 5.5-log reduction of Cryptosporidium.

Key Assumptions and Status

Table 50 UV Disinfection project key assumptions and information

Information source	• RFI0047 – UV Disinfection at Gladstone and Yarwun WTPs: Scoping Study Report (GHD, September 2016) • Manual for the application of HEALTH-BASED TARGETS FOR DRINKING WATER SAFETY (WSAA, September 2015)
Investment Driver	Not stated
Intended Outcome	To achieve nominated target log removals for Cryptosporidium at Gladstone and Yarwun Water Treatment Plants
Current Project Status	Not stated. No business case has been provided by GAWB. Concept designs have been developed for each site.
Procurement and project delivery Process	Not stated by GAWB. GHD report nominates D&C as delivery process.

Options analysis

An options analysis for the implementation of UV at Gladstone and Yarwun WTPs has been undertaken by GHD, considering alternative arrangements for the installation of the units at each site. This includes consideration of single or multiple units to provide a balance between operations and maintenance and redundancy.

GAWB has not provided any documentation showing alternative treatment options to the implementation of UV disinfection which might be expected to have been considered such as improvements to filter capacity or upstream activities to reduce contaminants.

Proposed Capital Expenditure

The capital expenditure forecast has been based on the engineering estimate developed by GHD in 2016 at $2.36 million, based on the implementation of UV disinfection at each of the sites and the preferred infrastructure arrangement. The project is planned for completion in 2024, with the capital forecast being adjusted for the year of commissioning to 3.54 million including 4% IDC.

As the estimate is based on the engineering estimated developed by GHD, it is anticipated that the final costs may be different following further design development and with the nomination of a preferred procurement process.

Table 51: Estimated capex – UV Disinfection ($ million, nominal)

FY	2021	2022	2023	2024	2025	Total
GAWB capex	$0	$0	$0	$3.54	$0	$3.54
Capitalised*	$0	$0	$0	$3.70	$0	$3.70

** includes actual expenditure and interest during construction*
Source: RFI0121A Attachment A IDC Response to KPMG's Working Draft Report (Full List of Projects).xlsx.

Assessment

Prudency

The drivers for this project are not well defined nor justified in the documentation provided. GAWB cannot rely on a justification of a regulatory based need for the project when the health-based targets are not yet mandatory. Justification of the use of these LRV targets based on the catchment area contamination risks, backed up by sampled pathogen levels, has not been provided, so a risk driver cannot be relied upon.

A detailed business case has not been developed by GAWB as the project is still in the early Scoping phase, and little evidence has been provided to establish the need for the works, being based primarily on a brief risk assessment documented by GHD in the scoping study. GAWB has not established the timing or procurement approach for the works, nor justified these in the documentation provided.

Additionally, GAWB has not demonstrated a robust options assessment giving consideration to the possible options to meet the targeted LRVs through operational changes or projects other than UV treatment.

Further definition and documentation is required, including a detailed risk assessment of the raw water sources and development of options including operational and non-treatment related. Moreover, the obligation for the timing of these works is not documented. The current regulations do not currently provide an obligation for GAWB to conduct these works in the nominated timing (i.e. either to bring forward or delay).

For the reasons outlined above, this project is not considered prudent investment.

Efficiency

Scope of Works

The project is in the concept design stage with the scope of works being reasonably well defined with preferred arrangements at each of the site and nominated specifications for detailed design. The works

have been based on WSAA's Manual for Application of Health Based Targets for Drinking Water Safety which are appropriate for consideration when identifying the risks for pathogen removal.

Standard of Works

A preliminary review of the concept design has been undertaken. The standard of works appears consistent with the progress of the project. It is expected that future design work would follow the normal water industry standard guidelines, and adopt GAWB's comprehensive construction standards and requirements, which strongly support efficient tendering processes.

Cost of Works

The cost estimates reflect the current preferred option noting that a full options assessment has not been completed (considering works that could be done apart from UV disinfection to achieve the log reduction values). KPMG notes configuration options for UV disinfection are presented, but options other than UV disinfection are not explored or presented.

The GHD cost estimates for Gladstone WTP (low pressure option) are $1,474,200, and for Yarwun WTP $889,200 (both excluding IDC), for a total of $2,363,400 (estimated dated September 2016). These are provided as $3.54 million at current prices. The cost estimates for the preferred option are reasonable at this level of project development.

It is recommended that GAWB implement the PMF Concept phase more rigorously so that additional options be developed, and therefore there is a high likelihood that the final cost estimate could be different to the estimates included in the current submission.

For the following reasons this project is not considered efficient:

- The scope of works is not based on a rigorous and complete options analysis;
- The cost of the works cannot therefore be assessed as the most efficient delivery to address the risk identified.

Summary findings

Based on the preceding analysis, GAWB:

- Has not demonstrated the prudency of the works, specifically the project need, lacking a regulatory driver, sufficient documentation from a risk assessment and risk driver, nor having a robust analysis of options;
- Has not demonstrated that the proposed approach is the most efficient, even though there is a developed scope of works and cost estimate for the current preferred option, noting that this may change with additional options analysis and development of a robust business case to be undertaken by GAWB.

In the absence of further information and detailed business case, we recommend that this project be deferred beyond the 2020-25 regulatory period, with allowances in the next regulatory period for funding to undertake a full options analysis and provide acceptable justification for the detailed work proposed on the best option identified.

Table 52: Recommended adjustment to forecast capex - UV Disinfection ($ million nominal)

FY	2021	2022	2023	2024	2025	Total
GAWB capex *	$0	$0	$0	$3.70	$0	$3.70
KPMG Proposed *	$0	$0	$0	$0.3	$0	$0.3
KPMG Proposed adjustment *	$0	$0	$0	($3.40)	$0	($3.40)

** includes actual expenditure and interest during construction*
Source: RFI0121A Attachment A IDC Response to KPMG's Working Draft Report (Full List of Projects).xlsx.

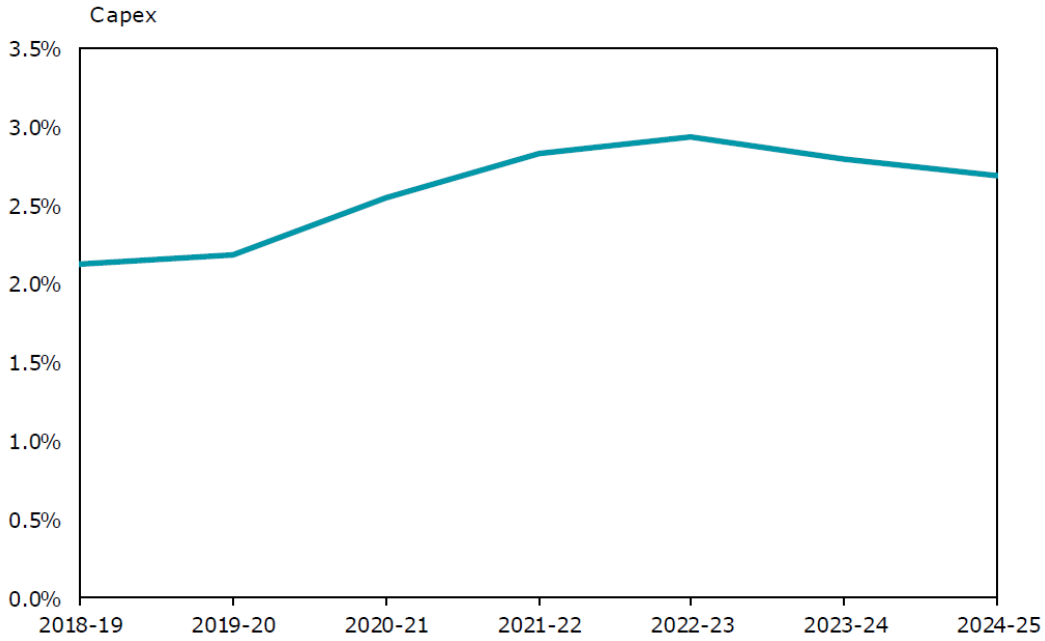
6.5 Assessment of escalation rates

GAWB engaged Deloitte Access Economics (DAE) to provide a forecast escalation to apply to capital expenditure. To do this, DAE determined:

- In 2017-19, the labour income share for the construction industry was 70 per cent, with the capital income share 30 per cent[58];
- Forecast labour costs will increase in accordance with forecasts of the Queensland Wage Price Index (WPI); and
- Forecast capital costs will increase in accordance with forecasts of the Brisbane CPI.

This results in a forecast average escalation rate of 2.82 per cent per annum across the next regulatory period.

Figure 14: DAE forecast capex escalation[59]



Source: Deloitte (2019) Cost escalation factors (2020-21 to 2024-25), prepared for Gladstone Area Water Board.

KPMG has a number of concerns with the forecast rate of capex escalation:

- It is not clear why GAWB is using ABS data to split the labour and capital components of its capex, as opposed to using GAWB's own recent historical data;
- It is not clear why GAWB has used the construction data to determine the labour and capital split, but then not applied a forecast of the WPI for the construction industry. As a point of reference,

[58] Australian Bureau of Statistics, *Estimates of Industry Multifactor Productivity 2017-18*, Cat No 5260.0.55.002 (28 May 2019)
[59] Deloitte Access Economics, Cost escalation factors (2020-21 to 2024-25) prepared for Gladstone Area Water Board, 15 August 2019, p. 25

the WPI for construction has grown by (on average) 1.83 per cent[60] for the last five years ,as compared to the Queensland WPI, which has grown by (on average) 2.13 per cent[61];

- Wages in the construction industry have grown much slower (1.83 per cent) than the Queensland average WPI (2.13 per cent), which is impacted by (for example) health care (averages wages growth of 2.65 per cent), education and training (2.61 per cent), information media and telecommunications (2.38 per cent), accommodation and food services (2.32 per cent) etc.;
- The Producer Price Index (PPI) for heavy and civil engineering construction has achieved average growth of 1.80 per cent[62] for the last five years, consistent with the construction WPI (1.83 per cent).
- The WPI for construction is more closely aligned with the Brisbane CPI, which has achieved average growth of 1.64%[63] per annum over the last five years (year on year growth using September quarterly data);
- Based on KPMG's assessment of public and non-public sources for CPI forecasts, we recommend an average annual CPI escalation factor of 2.0% to convert $2018-19 forecasts to $nominal. GAWB has not provided adequate justification as to why capex escalation should be (on average) 0.82 per cent higher.

What all of this means is that there are concerns with the appropriate calculation of escalation for capex, such that GAWB may be overstating the necessary escalation that should be applied. GAWB has used rates for labour and capital share that are based on construction sector averages, without correlating to its own data. It has therefore not justified use of this data as a basis for forecasting.

Similarly, wages in the construction sector have grown slower than the Queensland WPI over the last five years, providing evidence that use of the Queensland WPI may overstate wages growth related to capex.

The PPI for Heavy and civil engineering construction has also seen moderate growth of 1.8 per cent over the last five years, and the CPI for Queensland of 1.64 per cent.

Noting this series of conflicting evidence, we recommend that the QCA adopt an average annual escalation for capex of 2.0% per annum for the 2020-25 regulatory period, based on KPMG's assessment of the best available forecasts for CPI growth. This is 0.82 per cent per annum lower than the rate of escalation proposed by GAWB.

6.6 Assessment of interest during construction

In proposing the forecast amount to be capitalised, GAWB has forecast the associated interest during construction (IDC). IDC is an allowance provided by the QCA, to account for the interest on expenditure incurred, prior to commissioning.

[60] Australian Bureau of Statistics, 6345.0 Wage Price Index, *Table 9a. Ordinary Hourly Rates of Pay Excluding Bonuses: Sector by Industry, Original (Financial Year Index Numbers for year ended June quarter)*, Series ID A2712372L
[61] Australian Bureau of Statistics, 6345.0 Wage Price Index, *Table 2a Total Hourly Rates of Pay Excluding Bonuses: All Sectors by State, Original (Financial Year Index Numbers for year ended June quarter)*, Series ID A2704662K
[62] Australian Bureau of Statistics, 6427.0 Producer Price Indexes, *Table 17. Output of the Construction industries, subdivision and class index numbers*, Series ID A85219099L
[63] Australian Bureau of Statistics, 6401.0 Consumer Price Index, *TABLES 1 and 2. CPI: All Groups, Index Numbers and Percentage Changes*, Series ID A232586R

To forecast an appropriate amount of IDC, GAWB has applied a post-tax real vanilla weighted average cost of capital (WACC)[64], to nominal expenditure. To do this, GAWB has determined an equivalent monthly real WACC, and applied this to the duration of months between construction commencement and commissioning. This approach is robust.

The QCA has confirmed that it does not require KPMG to review the WACC or its underlying assumptions, and that it will update the WACC value ahead of its Final Report in May 2020.

6.7 Assessment of capex-opex trade-offs

One of the fundamental questions that a regulated utility needs to address is whether the volume, quality and reliability of the services it provides to its customers are provided at lowest sustainable economic cost. A second order question that arises for the utility is whether or not the service volume, quality and reliability are best maintained through application of investment via opex or via capex.

In order to answer these questions and identify lowest efficient economic cost service provision a capex opex trade-off analysis is undertaken. It is usually performed either as part of the capex options analysis during project development (for GAWB the Concept phase in the PMF), or as an output of the asset management system which feeds the ongoing program development.

In the first instance, a broad range of solutions are identified in the options analysis which include capex, opex and mixed solutions to the problem identified.

In the second instance, data on the network and asset performance needs to be obtained and analysed. This is usually undertaken by a mature asset management function within the utility, and is heavily dependent on data acquisition, data accuracy and a robust and modern IT system, used efficiently.

Asset management systems gather information on the asset condition, and the types and frequency of failures of particular assets and asset types. The objective of the analysis is to understand where there is a financial incentive to cease paying for repairs as failures arise and instead undertake a complete replacement of the asset as capex to bring down the failure rate and reduce the opex. Where replacement is the economically efficient cost, consideration is also made as to whether a capacity upgrade is likely over the life of the new asset, and this is factored into the design.

The analysis of capex opex trade-off is undertaken using discounted cash flow (DCF) techniques. As a minimum it is effectively a two-project decision tree, in that the net present value (NPV) of the continuing opex path is compared to the NPV of asset replacement through capex, to identify when investment in a replacement asset will be financially beneficial for an organisation. Mixed expenditure projects are examined on the same NPV basis. Leaving aside discussion of the regulated incentive mechanisms applied to a regulated entity, financial benefit is usually maximised through cost reduction without reduction in volume, quality or reliability of service provision to the customer.

An example of the capex opex trade-off analysis might include the analysis of pipeline leaks or bursts which usually become more frequent as the pipeline ages. Initially the pipe failures are addressed by isolating the pipeline, excavating around the leak, and patching the pipe to allow its return to service. However, where a pipeline experiences multiple bursts over a number of years, a point will be reached where the opex solution becomes more expensive than the replacement of the pipeline itself.

Such a situation arose with the South Gladstone Pipeline and in particular the Stage 3 project for implementation in 2020 and commissioning in 2021. The Business Case for this project was approved

[64] We note that GAWB's submission on page 123 states that it is a post-tax 'nominal' vanilla WACC, but our calculations confirm this is a typo.

for implementation in September 2019 and uses an NPV analysis to examine the options and decide on a way forward which had been identified. KPMG notes the analysis would be enhanced if the externality costs could be included in the business-as-usual options identified (both do nothing and leak monitoring), but with repair and customer impact costs included.

In reviewing the information on the requested sample capex projects, KPMG identified this example of formal application of an NPV analysis of the capex opex trade-off analysis by GAWB in the Planning phase documentation. GAWB has been implementing a simplified approach similar capex versus opex cost analysis (without time value of money discounting) within its strategic planning activities, as evidenced by the GHD Strategic Network Review report[65].

KPMG has identified a model template which GAWB has used to develop the cost estimates needed for the Concept phase[66] of the PMF. Detailed cost estimates are developed as part of the later Planning phase leading to the Business Case for a particular project. While this template is very useful from a project budgeting point of view it does not allow high level NPV analysis of project options. Development of a standard cost and NPV tool would provide stronger justification for proceeding to the economically efficient option.

Conclusion on Capex Opex Trade-offs

KPMG has identified that GAWB is implementing capex opex trade-off techniques within the PMF process. Because of the project sample basis used for this regulatory review, it is unclear whether this is undertaken in all new Business Cases and is a central element of the PMF decision-making process.

KPMG would encourage GAWB to develop an NPV template to assist with early options analysis in the Concept phase of the PMF, whereby there is stronger justification for the selected option to carry forward into the Planning phase, and ultimately the project Business Case. More detailed NPV analysis is likely to be available as the costs for the selected option improve in accuracy, and be a feature of the Business Case itself, as was seen for the GWTP to South Gladstone Reservoir Stage 3 project.

6.8 Assessment of Systemic Issues

For this section we undertook an analysis of our major project assessment to determine if any systemic issues could be identified, that is, issues that are likely transferrable from the major projects reviewed to the broader capital program. These systemic issues may then give cause to apply a broader expenditure adjustment across the remaining capital program. Our analysis also relied on the results of the corporate governance review and the capital planning and asset management review sections of this report.

Systemic issues are most commonly identified in ongoing programs of work such as renewals and in specific components of the processes used to develop and deliver major projects. Our assessment of all historical capital expenditure to date has identified that GAWB have on many instances had actual capex exceed the originally forecast capex. However, as not all actual projects were above the forecast, the outcome could not necessarily be deemed systemic.

The latter issues around delivery of capital expenditure might include issues such as the incorrect application of contingency measures or in the use of incorrect or inefficient unit cost rates. Further issues assessed as systemic would also include unsatisfactory performance in the delivery of

[65] Refer RFI0046, "GHD, 4220713-REP-0 GAWB Strategic Network Review 2020-2024.pdf".
[66] Refer file "IPD2017-055 GWTP to Sth Gladstone Res Stage 3.xlsx", within RFI0076, which is an example of a template to estimate project costs. Also the weekly and monthly Project Estimating Tool under RFI0072, for example "RFI 0072 Project Estimating Tool – Monthly.xlsx".

expenditure such as consistent delays in project delivery or in the underestimation of time required for key project stages (often around planning approvals or specialist works such as environmental studies or community engagement).

The following issues were evident in the documentation to the more complex capex projects and in the spreadsheet summaries of all originally forecast and actual capex for 2015-2020:

- A number of variations were agreed with contractors during the project delivery, leading to cost outcomes higher than originally forecast;
- While some of these were outside the control of GAWB, others might have been avoided from a stronger focus on more detailed reference design and documentation; and
- GAWB has in many instances underestimated the capex required for projects at the beginning of the regulatory period and on delivery ended up with higher costs at commissioning (above the IDC escalation anticipated).

However, the apparent preponderance of overspend in the current period needs to be corrected by GAWB in the next regulatory period, and KPMG suggests a stronger adherence by GAWB to the application of the corporate governance, asset management and capital planning process as outlined in its capex documentation. In particular the Project Management Framework, needs to be rigorously applied to avoid a repeat of project cost overruns in the 2020-2025 regulatory period.

Of the sample forecast projects assessed, KPMG has also noted the following issues with GAWB's forecast capex:

- The standard of works has commonly not been detailed. While this can be put down to the early stage of the planning process, it also indicates a lack of clear understanding of what technical requirements the solution will need to deliver, and hence a number of variations may be required to support successful delivery;
- When deciding between refurbishing or maintaining an asset (to extend its useful like) or replacing it, GAWB commonly determines that replacement is appropriate, on the basis of risk reduction. While reducing risk of service reliability/compliance issues is a reasonable bases for investment, it should be supporting by (for example) declining asset condition, service performance or customer preferences learned through robust engagement. GAWB has not provided adequate evidence (in many cases) that there are asset performance or condition issues (now or in the near term) that warrant investment.
- GAWB commonly identified that a driver for investment was to maintain high reliability standards, driven by customer needs. For example, a common basis for investment was that customers were not willing to accept any risk of supply interruption, given the large commercial impacts. Noting these assertions, it did not provide adequate evidence that documented:
    - Discussions with affected customers and/or presentation of customer feedback that articulated these servicing needs; and
    - Options and customer impacts were presented to customers that would allow them to present their willingness to pay for improved service levels.
- Application of the project management framework (separately discussed below).

Noting these concerns, these do not justify a systemic adjustment to GAWB's forecast.

KPMG recommends that in the future, GAWB more clearly articulates the driver for investment, by more carefully considering the need and timing requirement. Further, as GAWB only has a small number of large customers, it has a greater ability to directly engage with these customers on the level

of service they require, and their willingness to pay given the potential trade-offs between price, the quality and reliability of service.

As a result, the only systemic adjustment that KPMG is proposing is to account for lower capital escalation.

Project Management Framework

The Project Management Framework (PMF) defines capex using an approval flowchart for each of 4 levels of project risk and 5 phase of activities following agreement to a New Idea or Project. Level 1 has the lowest risk, and therefore is likely to have a smaller project expenditure and there are fewer gateway decision points and less documentation required. Level 4 is the highest risk profile with the highest expenditure levels and for delivery over longer periods, and has the highest documentation requirement.

Table below displays the primary activities in each phase and for each risk level, with time progressing from left to right across the diagram. The decision gateways are shown and the primary decision gateway occurs just prior to the Implementation Phase when the majority of the capex is finally committed.

Table 53: Summary of Project Phases, Activities and Risk Levels

Risk Level	New Idea	G	Concept Phase	G	Scoping Phase	G	Planning Phase	G	Implementation Phase	G	Close-out Phase
4	Form		Business Justification		Options Development		Detailed Design		Contract Award		Procurement Conclusion
			Next Phase Planning		Concept Design		Tendering		Construction Management		Project Close Out
					Options Selection		Project Scope Approval - Final		Commission		
					Next Phase Planning		Project Execution Planning				
3	Form		Business Justification		Options Development & Selection		Tendering		Contract Award		Procurement Conclusion
			Next Phase Planning		Concept Design		Project Scope Approval - Final		Construction Management		Project Close Out
					Detailed Design		Project Execution Planning		Commission		
2	Form		Business Justification		Options Development & Selection		Tendering		Contract Award		Procurement Conclusion
			Next Phase Planning		Concept Design		Project Execution Planning		Construction Management		Project Close Out
					Detailed Design				Commission		
1	Form		Business Justification				Quotations		Contract Award		Procurement Conclusion
							Project Execution Planning		Construction Management		Project Close Out

Source: RFI0009 & 0074, Project Management Framework & Templates
Note : G = Gateway Decision =

Source: KPMG analysis.

Table 56 provides the error band which is provided in the PMF flowcharts and templates. The percentage error in each phase is the level required at the prior decision gateway before the additional phase activities can proceed. Once again higher risk projects have a more graded reduction in error bands as the cost estimates are successively tightened as additional work is undertaken in each phase.

Table 54: Cost Estimate Error Bands at each Phase

Risk Level	New Idea	G	Concept Phase	G	Scoping Phase	G	Planning Phase	G	Implementation Phase	G	Close Out Phase
Level 4	+/-100%		+/-50%		+/-30%		+/-10%		+/-5%		0%
Level 3	+/-100%		+/-50%		+/-10%				+/-5%		0%
Level 2	+/-100%		+/-50%		+/-10%				+/-5%		0%
Level 1	+/-100%		+/-10%						+/-5%		

Source: RFI0009 & 0074, Project Management Framework & Templates
Note : G = Gateway Decision =

Source: KPMG analysis.

Table 57 shows the additional cost factors which are proposed in the PMF, above the direct costs associated with the design, engineering, plant & equipment and internal labour costs. They are applied to the total direct costs.

Table 55 : Additional Cost Factors Applied

Added Cost	Concept Phase	Scoping Phase	Planning Phase	Implementation Phase	Close Out Phase
Growth Allowance	5.0%	5.0%	5.0%	5.0%	5.0%
Contingency	10.0%	10.0%	10.0%	10.0%	10.0%
Escalation	2.5%	2.5%	2.5%	2.5%	2.5%

Source: RFI 0072 Project Estimating Tool - Monthly.xlsx, Worksheet Estimate

The GAWB Monthly and Weekly PET spreadsheets both lock in these values for all Project Phases, but unclear if different by Risk Level.

Source: KPMG analysis.

In a GHD strategic network review report[67] on capex for the 2020-2024 years, GHD applied the following escalations to its direct cost estimates for the pipeline and reservoir projects it had identified as likely to be required. These escalations were:

- Preliminaries (including engineering) at 20%;
- Testing and disinfection (if needed) at 1%; and
- Overall contingency at 30%.

The level of analysis suggests this capex analysis was used to inform decisions likely to occur at the scoping phase in the PMF. One of the areas in application of its PMF which GAWB needs to be improving is the consistency between the direct cost estimates it seeks form external parties, and escalations and allowances it applies to these. The primary objective must be to ensure there is no double counting occurring between the application of contingency.

[67] GHD, Strategic Network Review, 2020-2024, Pipelines & Reservoirs, page 69.

7 Operating expenditure

7.1 Introduction

A major component of the regulatory framework applied to GAWB is quantification of forecast operating expenditure and a review of the prudency and the efficiency of historical and proposed operating expenditure. This review is an essential input upon which the QCA will form an opinion of GAWB's revenue requirement (or maximum allowable revenue). The QCA considers operating expenditure to be:

- Prudent if it can be justified by reference to a need or cost driver; and
- Efficient if it minimises GAWB's long run costs of providing services.

The QCA's approach to prudency and efficiency forms the basis of our assessment.

The assessment of prudence requires KPMG to investigate the rationale and drivers behind the levels of expenditure proposed and to determine whether the reasoning underlying GAWB's forecast operating expenditure is appropriate. This entails assessing whether the expenditure is consistent with and clearly linked to GAWB's obligations, be these legislative, driven by corporate vision or mission statements, or by customers' willingness to pay.

Efficiency refers to whether the forecast expenditure is reasonable given time and resource constraints and in some cases whether the forecast expenditure represents the least cost option for providing the associated service. Evidence of efficiency can include feasibility and options studies, independent peer review of costs, and market based contracting.

This assessment is undertaken by reviewing documentation supporting the expenditure under review ranging from statements of corporate intent to planning and strategy studies, life cycle management plans or more specifically to design investigations. In the case of operating expenditure, supporting documentation may include operating budgets and plans, evidence of regulatory obligations, levels of service requirements or simply evidence of capital assets requiring ongoing operating expenditure.

The types of evidence that KPMG considered in assessment of GAWB's proposal include:

- evidence of prudency;
- evidence of an appropriate and robust decision making process;
- surveys and consultations undertaken with customers;
- evidence of efficiency;
- feasibility studies;
- options analysis;
- independent peer reviews of costs; and
- supporting documentation for the determination of contingencies, allowances and escalation factors.

The following tables summarise GAWB's proposed operating expenditure and KPMG's recommended expenditure profile.

Table 56: GAWB proposed opex ($ nominal)

$ million	2021	2022	2023	2024	2025
Operations	2,136,168	2,228,024	2,293,658	2,379,314	2,434,641
Maintenance	4,011,609	4,310,804	3,791,468	4,202,996	4,132,407
Electricity	3,035,681	3,098,216	3,162,039	3,315,764	3,384,069
Chemicals	715,463	737,142	782,014	805,709	830,122
Employment costs	13,036,958	13,419,393	13,886,803	14,206,418	14,742,123
Rates	512,406	526,855	541,713	556,989	572,696
Insurance	1,545,562	1,515,566	1,605,074	1,795,518	1,796,754
Information systems	3,288,676	2,862,491	2,997,086	3,180,862	3,089,544
Professional services[a]	4,504,161	2,552,886	2,415,614	3,328,532	4,791,729
Administration	1,730,688	2,191,774	1,777,372	1,881,645	1,917,460
Total proposed opex before efficiencies	**34,517,372**	**33,443,150**	**33,252,841**	**35,653,744**	**37,691,544**
Efficiency savings[b]	(228,568)	(255,217)	(235,135)	(242,181)	(246,374)
GAWB proposed opex (including efficiency)[b]	**34,288,804**	**33,187,933**	**33,017,707**	**35,411,563**	**37,445,170**

a *The professional services spend in the data supplied by GAWB does not align with the amounts in GAWB's written submission to the QCA. GAWB explains this is because the written submission excluded the QCA levy and other QCA related costs. For further detail, see section 7.5.9.*

b *Efficiency savings are KPMG estimates based on the opex forecast data provided by GAWB, and GAWB's proposed efficiency target. The saving are slightly overstated as we did not have the level of data granularity necessary to identify uncontrollable expenses associated with water treatment plant operators. This also means that our estimated proposed opex is slightly lower than GAWB's actual proposal.*

Table 57: KPMG recommended opex ($ nominal)

$ million	2020-21	2021-22	2022-23	2023-24	2024-25
Operations	2,106,435	2,172,159	2,228,396	2,289,901	2,340,656
Maintenance	3,151,713	3,265,592	3,367,051	3,539,023	3,554,335
Electricity	2,473,668	2,400,634	2,400,634	2,400,634	2,400,634
Chemicals	695,467	709,306	725,691	741,584	757,825
Employment costs	12,940,634	13,319,204	13,822,598	14,144,939	14,676,887
Rates	506,321	519,538	534,788	549,385	564,328
Insurance	1,436,574	1,403,298	1,483,426	1,652,588	1,653,909
Information systems	3,242,546	2,813,787	2,946,380	3,123,684	3,030,746
Professional services	3,092,443	2,612,226	2,675,332	3,066,495	4,485,461
Administration	1,579,812	1,561,161	1,602,010	1,669,905	1,668,922
Total recommended opex before efficiencies	**31,225,613**	**30,776,906**	**31,786,306**	**33,178,139**	**35,133,703**
Efficiency adjustment	*(441,898)*	*(875,842)*	*(1,301,975)*	*(1,720,437)*	*(2,131,367)*
KPMG recommended opex (including efficiency)	**30,783,715**	**29,901,064**	**30,484,331**	**31,457,702**	**33,002,335**

Table 58: Difference between proposed expenditure and KPMG recommendations ($ nominal)

	2020-21	2021-22	2022-23	2023-24	2024-25
GAWB proposed (including efficiency)[a]	**34,288,804**	**33,187,933**	**33,017,707**	**35,411,563**	**37,445,170**
KPMG functional adjustments	*(3,291,759)*	*(2,666,244)*	*(1,466,536)*	*(2,475,605)*	*(2,557,841)*
KPMG additional efficiency adjustments	*(213,330)*	*(620,625)*	*(1,066,840)*	*(1,478,257)*	*(1,884,994)*
KPMG recommended opex (including efficiency)	**30,783,715**	**29,901,064**	**30,484,331**	**31,457,702**	**33,002,335**
Annual difference	*(3,505,089)*	*(3,286,869)*	*(2,533,376)*	*(3,953,861)*	*(4,442,835)*
NPV of difference	**($14,810,834)**				

a *The efficiency savings included in GAWB's proposed opex figures are KPMG estimates based on the opex forecast data provided by GAWB, and GAWB's proposed efficiency target. The saving are slightly overstated as we did not have the level of data granularity necessary to identify uncontrollable expenses associated with water treatment plant operators. This also means that our estimated proposed opex is slightly lower than GAWB's actual proposal.*
Note: *NPV calculations based on a 6% discount rate*

7.2 KPMG's analytical approach

We have tested GAWB's expenditure against the QCA's definition of prudency and efficiency through the following criteria:

For prudency:

- Any material change in expenditure trends is explained by a clear and justified reason.
- Substitution between operating and capital expenditure possibilities have been identified and evaluated

For efficiency:

- Demonstration of a robust expenditure forecasting technique
- Procedures and governance consistent with good industry practice
- Appropriate consideration of customer values and needs
- Consistency of forecast expenditure with historical trends
- Application of reasonable and consistent assumption for input unit costs and growth estimates

As the data and information provided by GAWB did not support a BST approach, we have adapted our approach to address the QCA's scope.

There are three key steps to our assessment of GAWB's operating expenditure:

1. **Review of the previous expenditure review:** KPMG commenced its assessment by first reviewing the QCA's past bulk water price investigations with particular reference to the last operating expenditure review undertaken by Jacobs. The purpose of this review was to identify any issues or actions recommended by Jacobs and the QCA, which GAWB have subsequently sought to address over the course of the current regulatory period.
2. **Assessment of historical and forecast expenditure and forecasting method:** The next step was for KPMG to review historical and forecast expenditure, seeking to understand drivers of deviations from previous forecasts and historic trends. Specifically, this involved:

- Review of historical expenditure trends and how GAWB's actual expenditure tracked against previous forecasts.
- Review of GAWB' forecasts against historical trends and assessment of rationale for deviations from trend, including assessment of forecasting method.

3. **Further investigation of particular cost categories:** Based on findings in steps 1 and 2, KPMG carried out further evaluation of specific and material cost items to provide more detailed assessments of whether forecasts are prudent and efficient. This included a detailed review of forecasting methods (where provided) and supporting documentation to assess whether these are reflective of good industry practice and provides robust justifications for proposed expenditure.

To date our assessment has been informed by:

- Meetings with GAWB staff
- Data and documentation provided from GAWB
- Responses to further questions raised by KPMG.
- Comments and further information provided by GAWB in response to KPMG's preliminary findings.

GAWB's proposed operating expenditure forecast is an aggregation of constituent forecasts for individual operating expenditure categorised by function:

- Operations
- Maintenance
- Electricity
- Chemicals
- Employment costs
- Rates
- Insurance
- Information Systems
- Professional Services
- Administration

For each of the above functions this chapter sets out our findings and recommendations in relation to the prudency and efficiency of the forecasts.

7.3 GAWB's 2015-20 price review

GAWB's operating expenditure forecasts were last reviewed as part of the GAWB Water Price Monitoring 2015-20. The QCA engaged Jacobs to undertake the independent review of operating expenditure.[68]

The Jacobs review found GAWB's forecasts for the period to be largely both efficient and prudent. Jacobs identified three relatively minor issues:

[68] Jacobs 2014, https://www.qca.org.au/wp-content/uploads/2019/05/26893_Jacobs-GAWB-Prudency-and-Efficiency-Review-Feb-2015-1.pdf

- Staff costs – Jacobs adjusted FTE forecasts from 35.5 to 34.5. Jacobs recommend a resolution of the misclassification of a water treatment plant operator position and did not accept submitted additional non-routine item for an additional 0.5FTE for a portion of Curtis Island labour.
- Motor vehicles – Jacobs noted the acquisition of a Toyota Camry was unnecessary, however they also acknowledged that the associated savings are minor due to the need to source alternative transport (taxis) when there is a co-incident requirement for two vehicles.
- Electricity – Jacobs assessed electricity expenditure as partially efficient. They considered the escalators applied by GAWB to be inconsistent with recent AER draft determinations and Ergon Energy's pricing submission to the AER. Jacobs expected GAWB to realise savings over the regulatory period due to the implementation of risk management measures to limit adverse electricity market price movements and the realisation of efficiencies in the use and cost of electricity once operating constraints are relaxed by various capital works initiatives e.g. installation of VSDs limiting peak demand charges and installation of higher pumping capacity at GWTP allowing greater off-peak pumping.

The variance between the QCA's final proposed expenditure and that proposed by GAWB in its submission are outlined in the table below. The variance over the period is relatively minor with the QCA proposing a total reduction over the regulatory period of 4% or approximately $4.7 million.

Table 59: Recommended adjustments to operating expenditure 2015-20 ($m)

$ per ML	2015-16	2016-17	2017-18	2018-19	2019-20	Total
GAWB submission on draft report	21.72	22.09	22.79	23.37	24.96	114.92
Total QCA proposed	20.11	21.14	21.74	22.29	24.96	110.23
Variance	1.61	0.95	1.05	1.08	0	4.69

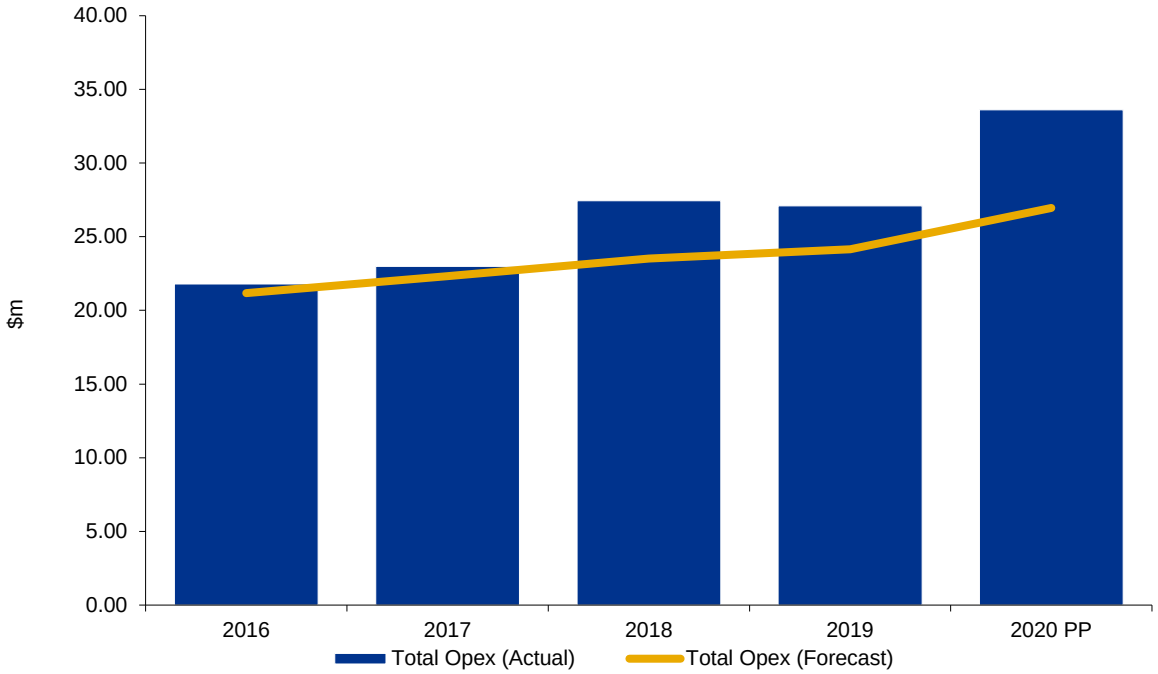
Source: https://www.qca.org.au/wp-content/uploads/2019/05/28038_QCA-Final-Report-May-2015-1.pdf

7.3.1 Comparisons of actual outcomes against historical forecasts

Figure 15 shows the relative difference between actual opex and that recommended by the QCA as efficient for the last regulatory period. Recommended opex is represented in the figure by the orange trend line. As can be observed, for each year of the current regulatory period from 2017-18 GAWB has delivered services at a cost materially higher than that approved as efficient in the previous price investigation.

Actual expenditure in 2015-16 and 2016-17 was consistent with that approved and allowed for by the QCA in the previous decision. Actual expenditure in 2017-18 and 2018-19 exceeded approved expenditure by approximately 17% and 12% respectively. The budgeted year for 2019-20 is also greater (25%) than the level of operating expenditure approved by the QCA in the previous price determination.

Figure 15: Total QCA allowed opex versus actual opex over current period



GAWB have ascribed this increase in costs to:

- Unanticipated increases in professional services costs related to a number of internal reviews of process and practices, including best practice reviews of:
    - Procurement practices and project management framework.
    - Governance practices.
    - Environmental policies and catchment management against obligations and best practice.
- Unanticipated increases in information system costs, including:
    - The development and implementation of the ICT Strategic Plan 2019-24 that transitions GAWB to cloud based computer services.
    - The implementation of GAWB's Enterprise Resource Planning (ERP) and the development of enterprise asset management modules to support GAWB's strategic asset management capability.
- Unanticipated increases in staffing costs associated with the implementation of the current LCMP framework.

An ex-post prudency and efficiency review of GAWB's operating expenditure over the 2015-20 regulatory period is outside of the scope of KPMG's assessment. However, for a number of cost items assessed as part of our review of GAWB's forecast operating expenditure, we needed to establish a reasonable baseline, particularly where forecasts were based on extrapolations of actual expenditure. In these cases, we formed a view based on historical expenditure and trends, and any additional information provided by GAWB to explain deviations from trends or significant cost increases. We also attempted benchmarking comparisons, but in most cases we did not find data that could be used for these purposes.

7.3.2 Comparisons of historical actuals with other utilities

Drawing useful comparisons in relation to efficiency or productivity with comparable utilities is problematic and requires access to adequate data. Detailed frontier based statistical analysis is outside the scope of our current review of GAWB's expenditure, however there is value in comparing GAWB's operating expenditure per unit of output against those levels experienced by other water utilities. The cost per ML of water supplied by GAWB as implied by its proposed base year is outlined in the table below.

Table 60: Total opex per ML GAWB ($nominal)

$ per ML	2015-16	2016-17	2017-18	2018-19	2019-20
GAWB	884.55	950.83	1,145.94	1,131.76	N/A

Source: BOM National Performance Report 2018-19 data used for ML of water delivered

The degree to which such analysis can inform our decision is heavily qualified and is dictated by the quality of the available data. We have sourced public data from the National performance report 2017–18: urban water utilities published by the Bureau of Meteorology and from opex forecasts approved by the ESC in the 2017 Urban Water Price Review. In making comparisons we are aware that individual utilities are engaged in a number of activities and provide a number of services that differ from those provided by GAWB. These utilities may also differ in their size and networks density along, the nature or composition of their customer base and the regulatory environments in which they operate. Nevertheless, broad comparisons across a multitude of utilities does provide a broader context to GAWB's proposal. The following table outlines the opex per ML of water delivered by water utilities. In relation to large water utilities (see following table), GAWB's opex per ML is lower than most large utilities for the period 2015-16 to 2018-19.

Table 61: Opex per ML of water delivered, large water utilities ($nominal)

$ per ML	2015-16	2016-17	2017-18	2018-19	2019-20
Barwon Water	1,523.91	1,860.12	1,857.31	1,582.44	N/A
City West Water	2,926.18	2,985.75	3,121.71	3,134.17	N/A
Gold Coast City Council	3,562.77	3,442.67	3,224.85	3,585.72	N/A
Hunter Water Corporation	1,057.69	1,032.95	1,041.59	1,000.98	N/A
ICON Water	2,249.61	2,463.88	2,055.30	2,083.79	N/A
Logan City Council	4,247.76	4,009.94	4,450.10	4,496.79	N/A
Queensland Urban Utilities	3,965.77	4,046.63	3,605.66	4,008.94	N/A
SA Water - Corporation	1,810.78	1,930.82	1,512.94	1,543.75	N/A
South East Water Ltd	3,196.87	3,051.16	2,822.12	2,911.00	N/A
Sydney Water Corporation	1,640.66	1,513.00	1,395.10	1,403.39	N/A
Tasmanian Water and Sewerage Corporation	1,789.41	1,553.21	1,443.04	1,543.69	N/A
Unitywater	4,032.36	4,033.00	4,162.90	4,273.41	N/A
Water Corporation - Perth	1,393.66	1,481.10	1,469.68	1,245.13	N/A
Yarra Valley Water	3,257.84	3,337.60	3,092.55	3,150.72	N/A

Source: BOM National Performance Report 2018-19

Note Opex per ML is calculated as 'operating cost – water' divided by 'volume of water supplied' – across all user groups

7.4 GAWB's forecasting approach

Based on our review of GAWB's proposed forecasts, we believe GAWB's method can be characterised as a hybrid method that incorporates elements of both a bottom up approach and a base-step-trend approach. When the data is examined at the GL descriptor level it becomes apparent that there are a number of forecasts that are steady state extrapolations of a base year (consistent with a base-step-trend approach) and a number that have profiles that vary over time consistent with a bottom up approach. Such a hybrid approach is appropriate where individual expenditure streams would be expected to vary significantly over time.

An overview of GAWB's approach to forecasting is provided in figure 16. Opex forecasts are based on a method that leverages the annual review process associated with LCMPs. LCMP data is reviewed and fed into GAWB's resource planning system to generate a forward opex program or schedule of activities. These activities are then considered on an individual business unit basis to generate individual five year forecast for each business unit.

While GAWB has provided an overview of its approach to forecasting it has not provided any detail regarding the actual method adopted to forecast. Based on our assessment of the forecasts provided it appears that GAWB use a number of different methods, from steady state extrapolations, and escalated extrapolations through to bottom up year on year forecasts.

Specifically, we found that GAWB:

1) Developed base line forecasts in real $2018-19 terms, based either on a bottom-up approach or extrapolation of a base year.

2) Applied Deloitte Access Economics (DAE) nominal escalators to convert the forecasts from $2018-19 to nominal values.

Once the forecasts have been developed for each businesses unit they are reviewed from a holistic or whole of business level to account for potential economies of scale and scope. During this process GAWB undertakes independent reviews of specific cost forecasts. GAWB also uses this stage to apply a productivity factor to the controllable portion of its opex forecasts.

Figure 16: Overview of GAWB forecasting approach

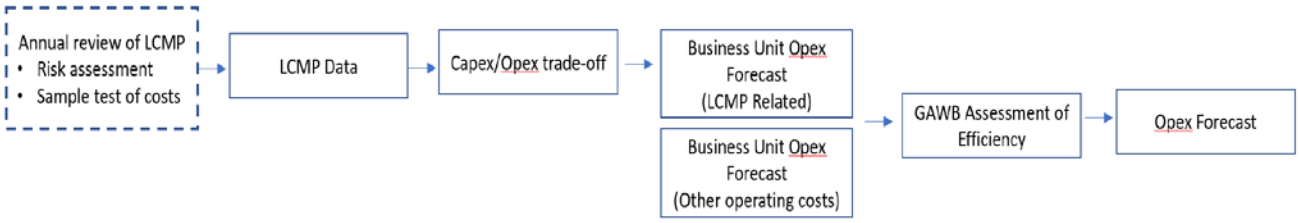


Table 62: GAWB opex forecasting method

Opex function	Method
Operations	Hybrid bottom up and BST forecast in real $2018-19, escalated by relevant DAE escalator(s). Some GL level forecasts have been escalated based on specific DAE escalators (such as the escalation of Trade Waste based on the DAE rates escalator).
Maintenance	Extrapolation of LCMP data. Appears that GAWB have generated bottom up forecasts for operations and maintenance in real terms. Then escalated to nominal based on DAE CPI (2.3% from 2021) applied to 2018-19 onwards.
Electricity	GAWB has forecast electricity costs by identifying step changes in costs in 2020-21 as well as in 2023-24, and then applying an escalation factor to these base level expenditures.

Chemicals	Bottom up forecast in real $2018-19, escalated by relevant DAE escalator.
Employment costs	Hybrid bottom up and BST forecast in real $2018-19, escalated by relevant DAE escalator(s).
Rates	Bottom up forecast in real $2018-19, escalated by relevant DAE escalator.
Insurance	Bottom up forecast in real $2018-19, escalated by relevant DAE escalator.
Information Systems	Bottom up cost forecast based on ICT strategy. Escalated to nominal based on the DAE CPI (2.3% from 2021) applied to 2018-19 onwards.
Professional Services	Hybrid bottom up and BST forecast in real $2018-19, escalated by relevant DAE escalator(s).
Administration	Hybrid bottom up and BST forecast in real $2018-19, escalated by relevant DAE escalator(s).

Source: GAWB and KPMG analysis

7.4.1 Cost escalators

The approach adopted by GAWB differs from a typical base trend and step approach in that the business has chosen to apply a relatively large number of input cost escalation factors. GAWB have used separate input cost escalation factors for different opex cost categories ranging from electricity to chemicals and insurance as shown in Table 68. These escalation factors have been applied to forecast opex GL cost item level.

The cost escalation factors presented by GAWB were prepared by Deloitte and draw on Deloitte Access Economics (DAE) macroeconomic forecasts for the Queensland economy, in particular the forecasts for the Consumer Price Index and Wage Price Index. The DAE model (DAEM) is a dynamic model of the whole Australian economy. It has a theoretically consistent long term open economy growth path, together with sort-term dynamics derived from Australia's economic experience over the past 30 years. The model provides forecasts for key economic variables – including gross domestic product, and its components at the national and state levels employment exchange rates price inflation wages and interest rates.

The application of the escalators is discussed in more detail in our functional analysis in section 7.5.

Table 63: GAWB's proposed escalation factors (CAGR 2020-21 to 2024-25)

Cost category	CAGR Real (excl CPI)	CAGR Nominal (incl CPI)	Method
CPI	n.a.	2.30%	Deloitte Access Economics Macroeconomic Model (DAEM)
Employee costs	0.89%	3.22%	QLD WPI & public sector premium
Contract labour costs	0.72%	3.04%	QLD WPI
Contractors (service delivery)	0.72%	3.04%	QLD WPI
Electricity	-0.23%	2.06%	Component forecast (CPI based)
Chemicals	0.71%	3.03%	DAEM crude oil price
Other materials and services	0.54%	2.82%	Weighted average based on 75% QLD WPI + 25%Brisbane CPI
Professional services (engineering)	0.72%	3.04%	QLD WPI
Rates (Gladstone Regional Council)	0.50%	2.82%	Weighted average based 2017-18 council cost proportions: • 41% Materials & Services (75% QLD WPI & 25% Brisbane CPI) • 31% Employee costs (QLD WPI & public sector premium) • 24% Depreciation & amortisation (QLD CPI) • 4% Finance (QLD CPI)
Insurance	3.33%	5.70%	Brisbane CPI + historical premium

Source: Deloitte (2019) Cost escalation factors (2020-21 to 2024-25), prepared for Gladstone Area Water Board.

As seen in Table 65, forecasts of the WPI and CPI for QLD are key aspects of DAE's proposed escalators. We discuss these forecasts below.

QLD WPI

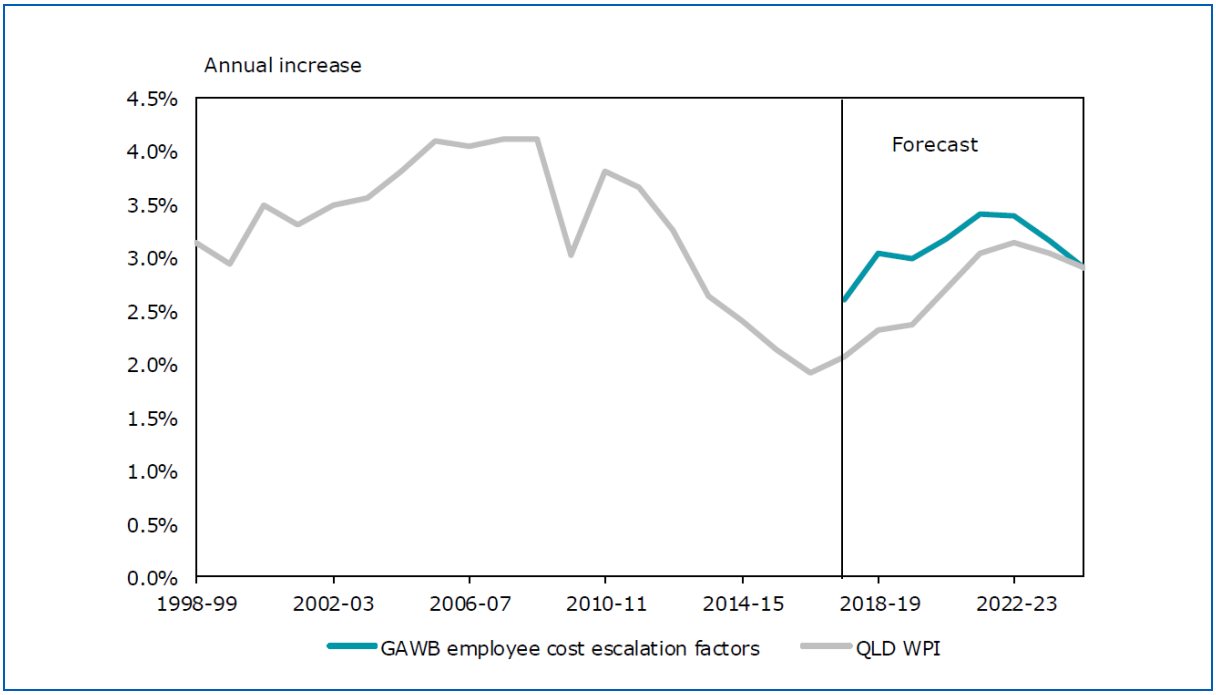
The DAE forecasts of Qld WPI are extrapolations of the WPI maintained by the ABS (6345.0 - Wage Price Index, Australia, Sep 2019).

The WPI measures changes over time in the price of wages and salaries unaffected by changes in the quality or quantity of work performed. The methodology used to construct the WPIs is similar to that used for other price indexes such as the Consumer Price Index. In the WPI, index numbers are compiled using information collected from a representative sample of employee jobs within a sample of employing organisations. Individual indexes are compiled for various combinations of state/territory, sector (private/public) and industry division.[69]

The year on year profile of WPI forecasts increases from 2018 through to 2022-23, followed by a decrease in 2023-24. The DAE forecasts are based on the assumption that in the long run, wage increases will correlate with those seen in the broader Queensland economy. In its advice to GAWB, DAE recommended a WPI average growth forecast over the period 2021-25 of 3.04%.

[69] Industry is classified according to the Australian and New Zealand Standard Industrial Classification (ANZSIC) 2006 (cat. no. 1292.0) (https://www.rba.gov.au/publications/smp/2019/feb/forecasts.html).

Figure 17: Deloitte WPI forecasts



Source: Deloitte (2019) Cost Escalation Factors (2020-21 to 2024-25)

An alternative approach to adopting Qld WPI forecasts would be to consider the ABS average weekly ordinary time earnings data as a basis for forecasts. However, the QCA in its Aurizon Network 2013-14 to 2016-17 review considered the ABS WPI index to be a better estimate of wage cost inflation because it is designed to measure pure prices changes in wages independent of workforce composition factors.

While both the WPI and Average Weekly Ordinary Time Earnings (AWOTE) are measures of the value of labour they are different. The WPI measures changes in the wages and salaries paid by employers for a unit (i.e. hour) of labour where the quality and quantity of labour are held constant. It has the dual purpose of monitoring wages and salaries inflation in the economy and supporting the compilation of the Australian System of National Accounts. To achieve this, the WPI is designed to produce a measure of pure price change in wages and salaries independent of compositional factors (i.e. the quantity and quality of labour are held constant).[70]

We consider the rationale for using the WPI is valid and that using DAE's forecast of WPI is an appropriate indicator changes to wages in the relevant escalation factors.

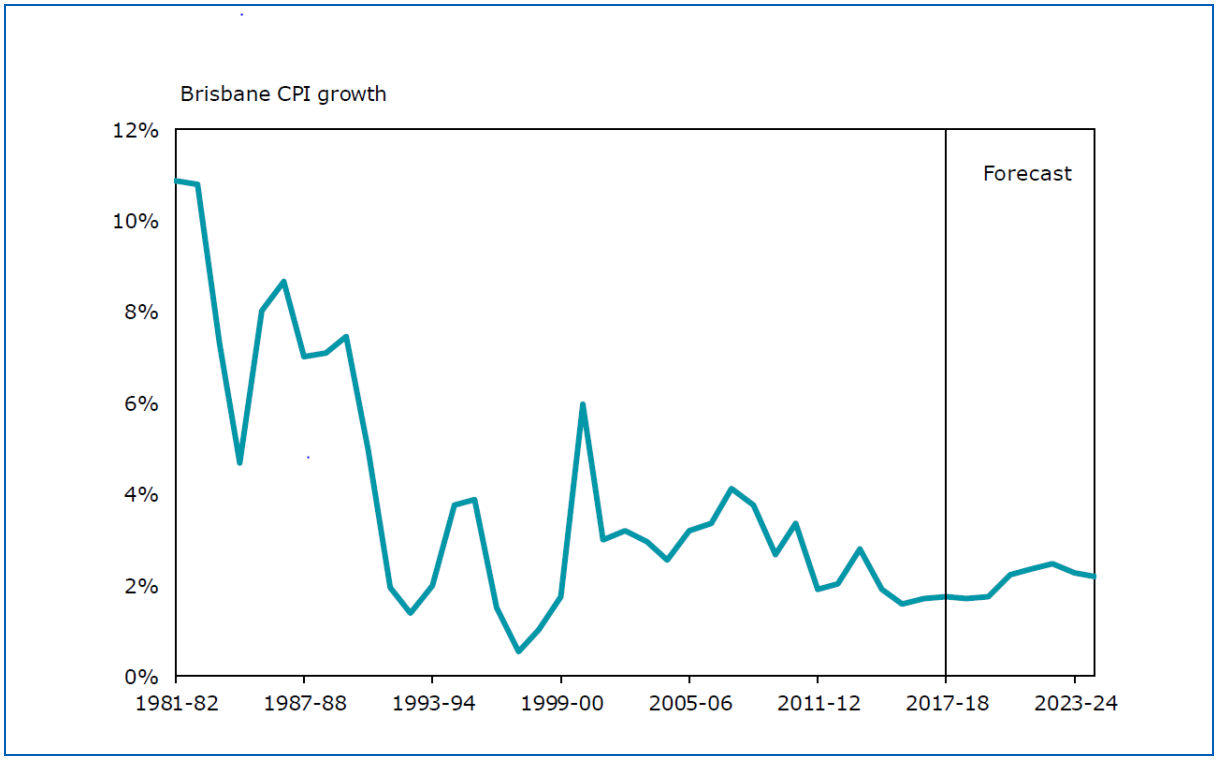
QLD CPI

The GAWB CPI based escalators are centred on Brisbane all groups CPI is forecast by DAE.

DAE notes that inflation growth in Brisbane has been relatively low in recent years, with annual inflation slightly below 2% since 2014-15. DAE assume that this trend reflects global disinflationary pressures and the drag associated with the recent downturn in mining investment activity in Queensland, which was exacerbated by a sharp correction in commodity prices in 2014-15 and into 2015-16. Since then, commodity prices have recovered, as have prospects for the Queensland economy more broadly. Combined with recent renewed stimulus by the Reserve Bank of Australia (RBA), DAE forecast Brisbane CPI growth to increase to be over 2% by 2020-21. In its advice to GAWB, DAE recommend a CPI CAGR of 2.3% for the period 2021-25.

[70]ABS (2015) feature article: average weekly earnings and wage price index – what do they measure? Last accessed 24/09/2017<http://www.abs.gov.au/ausstats/abs@.nsf/Lookup/6302.0main+features9May%202014>

Figure 18: Deloitte CPI forecasts



Source: Deloitte (2019) Cost Escalation Factors (2020-21 to 2024-25)

KPMG recommended adjustments to escalators

In reviewing GAWB's application of DAE's proposed escalators, we found that GAWB had applied the escalators incorrectly. For example, while DAE's escalation factors were calculated from 2020-21 onward, GAWB used them to convert values from $2018-19 as opposed to from $2019-20. We found that DAE's escalators were generally above the equivalent escalation factors that would apply to convert $2018-19 to $2019-20, and therefore GAWB's nominal forecasts in all years have been artificially inflated.

Based on our review of DAE's escalators and GAWB's application of these escalators, we have made the following adjustments which underpin our recommended opex forecast:

1) Supplanted some of DAE's proposed escalators with our view of more suitable escalators. Our recommend changes are set out in Table 66.

2) Updated the forecast CPI and WPI figures used in calculating the escalators to reflect our assessment of the best available forecasts.[71]

3) On the basis of the updated CPI and WPI figures, calculated and applied annual cost escalators for escalating costs from $2018-19 to nominal values. This solves GAWB's incorrect application of DAE's escalators, and ensures escalation in each year uses the best available information for that year, rather than a 4-5-year average.

[71] We considered a range of public and non-public sources for CPI and WPI forecasts, including: KPMG (January 2020) *Quarterly Economic Outlook – Global and Australian Forecasts*; RBA (November 2019) *Statement on Monetary Policy – Forecast Table*; DAE (September 2019) *Business Outlook – Oz muddles through global uncertainty*; DAE (June 2019) *Labour Price Growth Forecasts – Prepared for the Australian Energy Regulator*; QLD Treasury (June 2019) *State Budget 2019-20 – Budget Strategy and Outlook*; Australian Energy Regulator (October 2019) *Energex 2020-25 – Draft Decision – Fee-based and quoted services mode*l.

The resulting average compound escalators for converting forecasts in $2018-19 to $nominal are presented in Table 67.

Table 64: KPMG recommended changes to escalation methods (CAGR 2020-21 to 2024-25)

Cost category	DAE Method	KPMG recommended method	Reason for change
Electricity	Component forecast (CPI based)	No escalator used	Recommended forecast in nominal dollars
Chemicals	DAEM crude oil price	QLD CPI	DAE's proposed escalator is well above CPI growth, while historically growth in PPI for chemicals has been well below CPI.
Rates (Gladstone Regional Council)	Weighted average based **2017-18** council cost proportions: • 41% Materials & Services (75% QLD WPI & 25% Brisbane CPI) • 31% Employee costs (QLD WPI & public sector premium) • 24% Depreciation & amortisation (QLD CPI) • 4% Finance (QLD CPI)	Weighted average based **2018-19** council cost proportions: • 43% Materials & Services (75% QLD WPI & 25% Brisbane CPI) • 31% Employee costs (QLD WPI & public sector premium) • 23% Depreciation & amortisation (QLD CPI) • 3% Finance (QLD CPI)	GRC released its latest annual report with updated cost shares.

Source: Deloitte (2019) Cost escalation factors (2020-21 to 2024-25), prepared for Gladstone Area Water Board; and KPMG analysis.

Table 65: KPMG average compound escalators from $2018-19 to $nominal

Cost category	2018-19 to 2024-25
CPI	2.0%
Employee costs	2.9%
Contract labour costs	2.9%
Contractors (service delivery)	2.9%
Electricity	N/A[a]
Chemicals	2.0%
Other materials and services	2.6%
Professional services (engineering)	2.9%
Rates (Gladstone Regional Council)	2.6%
Insurance	5.4%

Source: KPMG analysis

[a] *KPMG's recommended electricity forecasts is in nominal terms, and does not require escalation.*

7.4.2 Efficiency factor

GAWB has proposed a static efficiency adjustment of 1% to its controllable operating and maintenance expenditure. GAWB's proposed efficiency factor is not compounding in nature. GAWB applies the target separately to its forecasts on a per annum basis, consequently the target and its associated efficiency is only netted off the base expenditure for the year in which it is applied meaning that the

efficiency saving for any one year reflects the target for that year and does not include the impact of the preceding years target.

This proposed application approach is not common. In other jurisdictions (such as Victoria) compounding efficiency targets is established practice. This means that the efficiency saving in any one year will reflect both the savings for that year and the ongoing savings resulting from efficiencies achieved in previous years. Compounding efficiency rates are analogous to the manner in which financial institutions apply compounding interest earnings to savings. Compounding rates allow for non-linear positive escalations of cost (for costs to increase at an increasing rate over time) and for non-linear negative escalations of costs (for costs to decrease at a decreasing rate over time). Effectively efficiency improvements achieved in any year are lock in for the future.

Compounding rates for efficiency gains are more consistent with the concept of ongoing or continuing efficiency than the static approach adopted by GAWB.

We note that GAWB's proposed static 1% per annum efficiency gain is:

a) inconsistent with the compounding application used by other regulators; and

b) towards the lower end of those factors both set by other regulators and proposed by the Victorian water businesses in the recent PREMO review.

Our advice is that a higher efficiency factor should be applied to GAWB and for that factor to be applied on a compounding basis. This will further help to ensure that the proposed expenditure reflect efficient and prudent costs over the next five years. Our reasons are:

- A significant proportion of the actual opex incurred during the current period by GAWB and proposed for the period is aimed at systems improvement and new initiatives. The objective of such expenditure is to improve the quality and efficiency of GAWB delivery of its services, rather than as a response to new obligations or growth. A higher efficiency factor will provide a strong incentive on GAWB to ensure that such expenditure meets its objectives and delivers additional value for its customers.
- Any efficiency factor applied to GAWB could reflect an element of both catch up and continuous efficiency.[72]
- A higher compounding factor is consistent with practices of other regulators and what has been both proposed and achieved by water business in similar circumstances to GAWB.

Under these circumstances we believe there is a strong case for the adoption of a higher efficiency target for this next period. We recommend the QCA adopt an efficiency factor of 1.8% compounded annually, consistent with the average proposed in the 2018 PREMO review and also within the range applied by regulators for water businesses in the past.

Appendix A discusses in greater detail the merits of compounding efficiency factors. In the section below, we discuss the application of efficiency factors to controllable expenditure and other considerations.

Application of the efficiency factor

GAWB has applied a static 1% annual efficiency factor to the controllable proportion of its total opex forecasts. GAWB has defined "controllable costs" operating costs that GAWB has direct influence over, "Uncontrollable costs" are operating cost that GAWB does not have direct influence over.

[72] Catch-up efficiency refers to the efficiency improvement needed for the business to catch-up to the production frontier, and is often applied to the first year of the regulatory period. Continuous efficiency refers to the expectation that the frontier itself will be continually moving as a result of ongoing innovations and cost savings due to technological change. Continuous efficiency is typically applied on a per annum basis, meaning it is compounding in nature. Efficiency factors are discussed in more detail in Appendix A.

GAWB's definition of uncontrollable costs references:

- GAWB's regulatory and compliance obligations.
- Costs imposed by a third party - a portion of GAWB's operating expenses subject to the countervailing market power of other parties. For example, due to a lack of scale and/or lack of competition in suppliers GAWB considers itself a price taker in relation to such costs as electricity and chemicals.

Those activities identified by GAWB as uncontrollable are listed in table 68.

As with the 2018 expenditure review undertaken by KPMG for QCA of Seqwater's proposed operating expenditure, we have adopted a definition of controllable and uncontrollable opex that is consistent with that adopted previously both by the QCA and by the ESC in Victoria. Uncontrollable costs are defined strictly as costs that the business has no control over and include such items as licence fees and environmental levies set by government. All other opex costs should be subject to the efficiency factor.

Table 66: GAWB proposed uncontrollable opex

Opex function	Uncontrollable costs
Operations Maintenance	• Environmental compliance costs • Handling of trade waste (six monthly and annual charges levied by the Gladstone Regional Council); • Water quality testing and management; • Land lease payments.
Electricity	• Fixed charge portion of its electricity costs are uncontrollable in nature, with the remainder of its costs defined as controllable.
Chemicals	• All chemical costs have been defined as an uncontrollable cost.
Employment costs	• Water treatment plant operators have been considered an uncontrollable cost.
Rates	• All rate costs have been defined as an uncontrollable cost.
Insurance	• All Insurance costs have been defined as uncontrollable in nature
Professional Services	• External audit fees – QAO is required to undertake GAWB's annual audits; • QCA fees – subject to the terms of the applicable referral notice, the QCA is required to undertake periodic reviews of GAWB's pricing arrangements.

Source: GAWB proposal https://www.qca.org.au/wp-content/uploads/2019/05/28038_QCA-Final-Report-May-2015-1.pdf

In general, we consider that GAWB has applied a too tight interpretation on what costs are within the control of the business. While GAWB has no control over some costs, it has significant influence over a portion of most cost items. In table 69 we outline reasons why we consider most of the costs identified by GAWB as uncontrollable are in fact controllable to a non-trivial degree.

Table 67: KPMG's view on GAWB's proposed uncontrollable cost items

Cost item	KPMG's reasons why these are controllable to a non-trivial degree
• Environmental compliance costs • Handling of trade waste • Water quality testing and management	These costs are to a significant degree affected by the processes, tools and resources GAWB chooses to utilise in meeting its obligations.

Land lease payments	GAWB has a non-trivial degree of control over its total land lease payments (in particular before building an asset) through for example: • its capital planning and design processes • its ability to negotiate and manage contracts • its decisions on whether to rent or own land.
Electricity fixed charges	While in the short-run, GAWB may have limited control over the fixed electricity charges it incurs, overt time GAWB has considerable influence over where and how it connects to the energy grid. For example, it can invest in both energy savings measures and local generation (eg, solar power hydro-power, co-generation, waste-to-energy).
Chemicals	GAWB has significant control over the manner in which it utilises these inputs through its technological choices and service supply solutions and therefore has control over the quantity and manner in which these inputs are utilised.
Water treatment plant operators (employment costs)	GAWB has control over employment costs associated with water treatment plant operators through its recruitment processes and wage negotiations, the potential use of contractors or third-party operators, the implementation of various automation technologies etc.
Insurance	GAWB has direct control over the timing and manner in which it goes to market and the manner in which it chooses to manage the risk profile associated with its assets.

Source: GAWB proposal https://www.qca.org.au/wp-content/uploads/2019/05/28038_QCA-Final-Report-May-2015-1.pdf

Based on our views set out above, we recommend applying the efficiency factor to most of GAWB's costs. We consider that the broad application of our proposed efficiency target to the majority of our recommended opex forecast compares favourably to other bulk water service providers and more appropriately reflects the impact of GAWB's recent and forecast investment in project/program management and IT. In fact, the application of the efficiency factor is a key aspect of our recommended forecast for many functions. We do not recommend adopting our forecasts without also our recommended efficiency factor.

Note that we do not recommend applying the efficiency factor to our forecasts of maintenance and electricity costs, for reasons set out below.

7.5 Opex forecasts by function

7.5.1 Operations

Operations expenditure forecasts and historical trends

In the current pricing period, GAWB has incurred operations expenditure during 2016-19 below the 2016 expenditure forecast on which GAWB based its prices. GAWB expects to spend more in 2019-20 than in previous years, resulting in a CAGR in actual operations expenditure of 3.2%, 1.5 percentage points above expected average inflation in the current period.[73]

The most significant increases in operations expenditure during the current period was in Environmental Compliance, which increased by $272,000 or 544% between 2015-16 and 2018-19 (nominal CAGR of 86%). GAWB explains this was due an increased level of attention on its environmental obligations in 2018 and 2019, and that following completion of the relevant work, expenditure is forecast to return to steady-state levels.

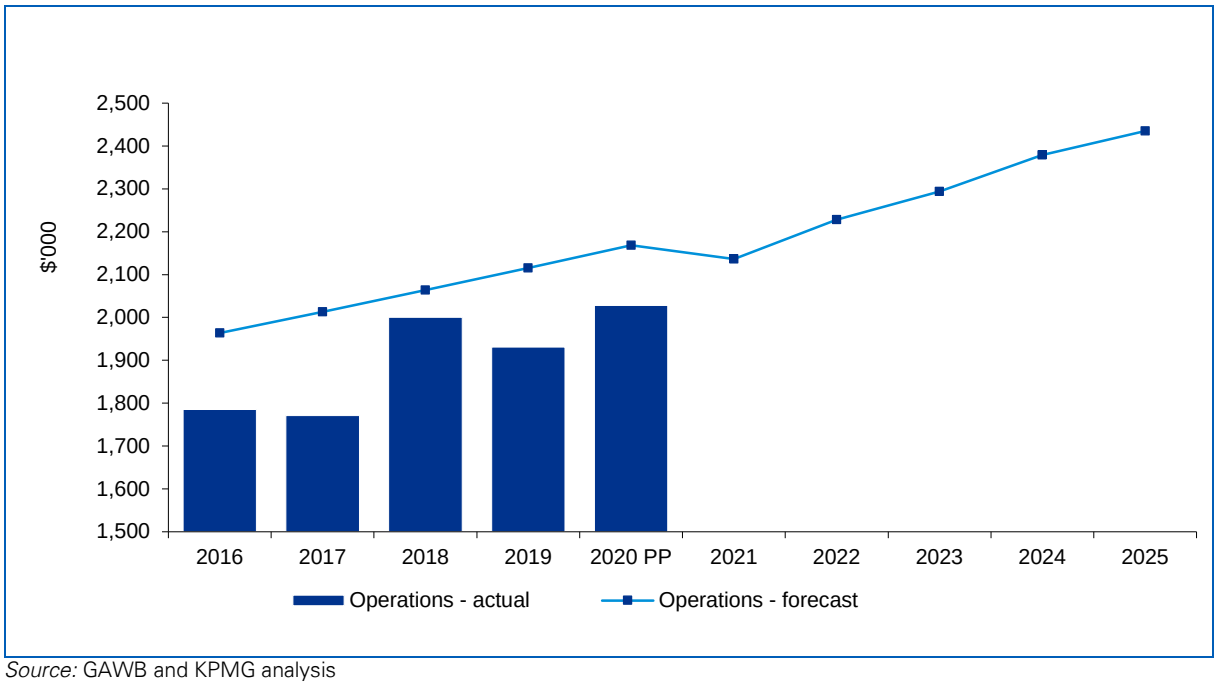
Land lease payments also increased rapidly in the current period, up $84k or 130% from $65k in 2015-16 to $149k in 2018-19 (nominal CAGR of 32%). These lease payments are forecast to continue to increase, and GAWB explains that this is due to new leases entered into to support the delivery of its capital expenditure program.

[73] Based on DAE forecast of QLD CPI in March 2020. DAE (Sept 2019), *Business Outlook - Oz muddles through global uncertainty*.

Trade waste charges also saw a significant increase over the current period, up $32k or 46% from $70k in 2015-16 to $102k in 2018-19. Trade waste charges are levied by the Gladstone Regional Council.

For the 2021-25 period, GAWB has forecast a step increase in operations expenditure in 2020-21, up by $108k pa or 5.6% relative to budgeted expenditure in 2019-20, and up $205k or 10.6% relative to expenditure in the 2018-19 base year. From 2020-21 through to 2024-25, GAWB's proposed operations expenditure would grow at an average annual rate of 3.3%, 1.3 percentage points higher than our recommended average inflation forecast for the period. GAWB's annual operations expenditure is forecast to grow from $1.9M in 2018-19 to $2.4M in 2024-25, an increase of $0.5M or 26% until 2024-25.

Figure 19: Operations forecasts and actuals



Source: GAWB and KPMG analysis

Operations forecasting approach

GAWB did not provide further detail on its forecasting approach for operations expenditure specifically. As noted above, forecasts appear to be a combination of a bottom-up and a BST approach.

Assessment of baseline costs

We consider GAWB's actual expenditure in 2018-19 excluding the temporary peak in environmental compliance cost is a reasonable baseline for forecasting operations expenditure. This view is based on expenditure trends during the current period and the fact that GAWB's actual expenditure in 2018-19 was well below the 2016 forecast.

Forecast drivers and assumptions

At the GL level, GAWB has forecast a number of cost items to see significant step increases in 2020-21 when compared with the 2018-19 base year. In particular:

- Fleet lease payments are forecast to increase by 23.4% from $521k in 2018-19 to $643k in 2020-21. GAWB explains that the increase is due to the acquisition of a truck as part of the new hatchery project. We also make the observation that while fleet leasing costs are forecast to be higher due to the acquisition of the truck for the hatchery project, the forecasts of fleet fuel and maintenance cost see a significant step decrease between 2018-19 and 2020-21. The combined decrease is $81k or 49%. GAWB explains that part of the observed variation in costs associated with fleet is changes in how costs have been recorded. However, due to the late timing of this information, we

have not been able to assess this for our draft report. We will consider this further in the final report.

- Water quality costs are forecast to increase by 32.9% from $320k in 2018-19 to $426k in 2020-21. In response to our working draft findings, GAWB refers to the approach it has used to forecast chemical costs. Given the link between water quality and the need for chemical use and quality management, we consider it appropriate that changes in water quality and chemical costs should align.
- Land lease payments are forecast to increase by 65.1% from $149k in 2018-19 to $246k in 2020-21. As noted above, GAWB explains that this is due to new leases entered into to support the delivery of its capital expenditure program. Based on GAWB's proposed capital program, we consider the forecast increase in land lease payments is reasonable.
- Hatchery food costs are forecast to increase by 87.2% from $50k in 2018-19 to $94k in 2020-21. GAWB explains this is due to the resumption of hatchery operations in 2020-21, with the new hatchery being designed to produce a significantly larger number of fingerlings.

From 2020-21 onward, GAWB forecasts the majority of operations costs to remain constant in $2018-19 terms. Key exceptions are costs associated with:

- Environmental compliance, forecast to increase by 22% or $40k over the period to 2024-25, at a CAGR of 5.2%. This growth follows a temporary peak in costs in 2018 and 2019 as GAWB carried out specific works, as outlined above. However, we note the forecast is above costs incurred in 2016 and 2017, prior to the one-off costs incurred in 2018 and 2019. GAWB explains that the higher forecast is due to a number of changes to its environmental reporting obligations, and the need to develop new processes and systems to assist in meeting its obligations.
- Water quality, forecast to increase by 21% or $90k over the period to 2024-25, at a CAGR of 4.9%. This is on top of the significant step increase between 2018-19 and 2020-21, outlined above. As noted above, GAWB links its forecast of water quality costs to its forecast of chemical costs.
- Hatchery food, forecast to increase by a further step change in 2021-22 of 14% or $13k, then kept constant in $2018-19 terms. GAWB explains this reflects the time it will take for the hatchery to reach full capacity.
- Safety, forecast to increase by 20% or $17k over the period to 2024-25, at a CAGR of 4.8%. GAWB explains this is due to increases in a number of consumables and other minor cost items, and that the increase aligns with the progression of key organisational initiatives, including initiatives focused on improving staff well-being.

Assessment of the application of escalators

In its proposal, GAWB applied DAE's recommended CPI escalator to produce its nominal forecast for all operations cost items, except for trade waste charges, where it has applied DAE's council rate escalator. As trade waste services are provided by the Council, we consider this to be reasonable. Our recommended forecast of operations costs applies our revised escalators for inflation and for council rate costs.

Summary findings

As noted above, we consider the 2018-19 baseline operations costs are reasonably efficient. We also consider the proposed increases are prudent, and the magnitude of the increases appear reasonable. We therefore recommend accepting GAWB's proposed forecasts in $2018-19, except for water quality costs, which we recommend keeping constant at 2020-21 levels ($2018-19). This reflects our recommendation on forecast chemical costs, and GAWB's submission that changes in these two cost categories should align.

As noted above, the application of our recommended efficiency factor on an annual compound basis is an essential aspect of our recommended opex forecast.

We also disagree with GAWB's proposal to deem as uncontrollable costs associated with environmental compliance, trade waste, water quality testing and management, and land lease payments. These costs are to a significant degree affected by the processes, tools and resources GAWB chooses to utilise in meeting its obligations, or its ability to negotiate (eg, land lease payments), and GAWB therefore has considerable control over these costs. As a result, we recommend applying the efficiency factor to all of GAWBs operations costs.

Table 68: GAWB proposed operations opex and KPMG recommendation ($nominal)

	2021	2022	2023	2024	2025
GAWB proposal	2,136,168	2,228,024	2,293,658	2,379,314	2,434,641
KPMG recommendation **(not including efficiency adjustment)**	2,106,435	2,172,159	2,228,396	2,289,901	2,340,656
Difference	(29,734)	(55,865)	(65,262)	(89,412)	(93,985)

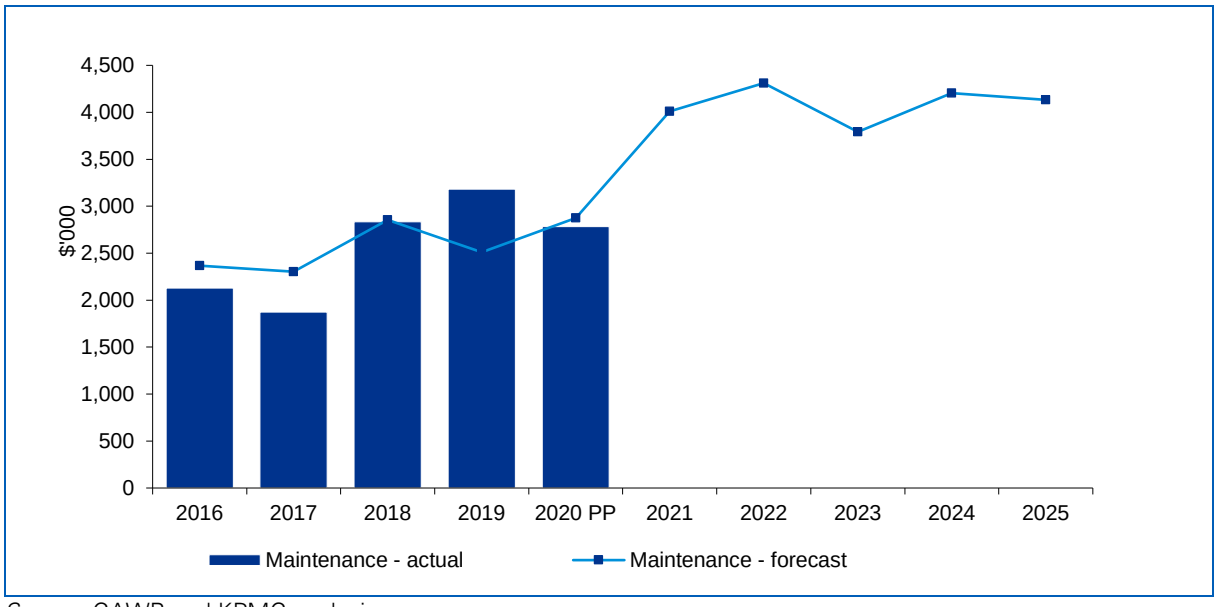
7.5.2 Maintenance

Maintenance expenditure forecasts and historical trends

At the start of the current period, maintenance costs fell and remained below forecast in 2015-16 and 2016-17. This was followed by an increase in maintenance spend in the two subsequent years, exceeding the forecast in 2018-19 by 26.7%. The CAGR for maintenance spend from 2015-16 through 2018-19 was 14.4%, well above inflation in the period. The primary driver for the increase was substantial increases in spend on general materials, stock adjustments and maintenance and renewals of electrical assets.

In the forward period, GAWB has forecast a significant increase maintenance spend. Relative to the 2018-19 base year, GAWB has forecast a step increase in 2020-21 of $829k or 26.1%. This higher level of maintenance spend is forecast to remain with moderate fluctuations over the remainder of the period.

Figure 20: Maintenance forecasts and actuals



Source: GAWB and KPMG analysis

Maintenance forecasting approach

GAWB's Asset Management Plan details the maintenance strategies adopted by the organisation, these are:

- Reliability centred maintenance (RCM)
- Preventative maintenance (PM) optimisation
- Run to failure
- Original equipment manufacturer (OEM) recommendations

In 2013 GAWB engaged a consultant to assess criticality across all asset classes to inform the prioritised development of maintenance strategies. The consultant's report included:

- An approach to identifying asset criticality
- Decision-making criteria for the application of maintenance strategies based on asset criticality and an assessment of existing equipment knowledge
- The outcomes of the criticality assessment including the nominated maintenance strategy for each asset class.

Figure 21: Matrix for the determination of maintenance strategies, – Criticality Analysis

		Equipment Knowledge	
		None	Existing PM program available
Criticality	Severe	Team-based RCM	PM Optimisation
	Significant	Analyst-driven RCM	PM Optimisation
	Moderate	Run to Failure or Use Manufacturer recommendations	Run to Failure or Use Manufacturer recommendations
	Low	Run to Failure or Use Manufacturer recommendations	Run to Failure or Use Manufacturer recommendations

Source: GAWB

Maintenance forecasts are developed with consideration for ground up LCMP funding models based on OPEX interventions and estimated intervention costs. The following LCMPs and associated funding models were reviewed in this assessment:

- LCMP0001 AADPS HV Electrical System
- LCMP006 Awoonga Storage Structures
- LCMP0009 SCADA
- LCMP0012 GWTP filters
- LCMP0028 High Lift Pump Station
- LCMP0031 Common Systems Cranes
- LCMP0035 YWTP Recovery Systems
- LCMP0039 Reservoir Boyne Island
- LCMP0046 Reservoir Mt Miller Potable Water
- LCMP0053 Catchment Buildings
- LCMP0075 OLS High Voltage
- LCMP0076 ICT

RFI documentation and interviews with GAWB indicated that the development of maintenance forecasts is based on data extracts from GAWB's CMMS (Computerised Maintenance Management System). Maintenance tasks definition, task frequency and cost estimates are supported by LCMP funding models. The process described by GAWB is detailed below:

- An initial ground up forecast is developed based on maintenance activities and estimated unit costs, the associated LCMP funding table is then updated.
- The forecast is updated based on the outcomes of consultant reports on any key focus areas
- Business unit managers develop a final forecast which considers factors including:
  - The initial forecast
  - Historical costs
  - Organisational objectives
  - Demand analysis
  - New compliance obligations
  - Directions from the board

Lifecycle Management Plans (LCMPs) include an extract of the scheduled preventative maintenance tasks allocated to assets in the CMMS. Funding spreadsheets have been developed to support each LCMP, spreadsheets detail CAPEX and OPEX interventions over the period 2019/20 until 2039/40. Interventions are costed with a cost justification provided. Costing methodologies include historical work order analysis, vendor estimates and rough order of magnitude estimates. Interventions are informed by LCMP maintenance schedules. GAWB indicated that they continuously improve schedules within CMMS resulting in slight differences between the LCMP funding models and maintenance forecast (which is based on an extraction from CMMS).

Assessment of baseline costs

Based on the data provided by GAWB, we consider actual maintenance spend in 2019-20 is a reasonable baseline, as it is lower than the 2016 forecast for that year. However, as noted above, GAWB has submitted that it has used a bottom up approach based on its LCMPs.

Forecast drivers and assumptions

In general, we would expect to see an increase in maintenance costs if:

- There is a change in standards or industry practice which leads to increase in maintenance
- That the volume of works remains the same but the input costs increases due to escalation
- That a sampling exercise identified a material and structural problem with an asset class which triggers the need for more maintenance.
- Increases in maintenance will lead to savings in other costs categories such as capex

The forecast provided by GAWB demonstrates a step increase in future maintenance costs. GAWB explains that the increase is a result of condition assessments finding assets in poorer conditions than previously known. Our observations are:

- The Asset Management Plan and consultant's criticality report define GAWB's approach for defining maintenance strategies and identifying end of life failure modes. GAWB were unable to provide evidence that the maintenance strategies have been developed and/or implemented. As a result it is unclear if OPEX interventions detailed in the Lifecycle Management Plans, entered into the CMMS and associated funding models have been developed based on the application of GAWB's proposed approach for defining maintenance strategies and are aligned with a robust, risk-based methodology.

- It is not clear how GAWB's criticality assessment approach relates to asset management objectives and customer service delivery outcomes. GAWB should consider updating the approach to detail alignment between risk categories, asset management objectives and customer outcomes.

- GAWB has provided KPMG with forecasting data to demonstrate the link between LCMP funding models and the final maintenance forecast for two business units which comprise the majority of the maintenance forecast. Due to timing of provision of this data, KPMG has been unable to test alignment between LCMP funding models and the maintenance forecast data.

Overall, without having considered in detail the recent data submitted by GAWB, we found there were no strong justifications for the proposed increase in maintenance spend. We also note that GAWB has proposed significant costs in professional services for applying and improving its LCMP framework. GAWB has note demonstrated how these investments will deliver benefits to customers.

Assessment of the application of escalators

In escalating its maintenance forecast from $2018-19, GAWB first specified a portion of maintenance spend as services (70%) and the remainder as materials (30%). It then applied DAE's recommended escalator for "contractors (service delivery)" to the services portion, and for "other materials and services" to the materials portion.

DAE's escalator for "contractors (service delivery)" is based on its forecast of the QLD WPI. We consider using forecast WPI as the basis for escalating the services portion of maintenance is reasonable. However, we note that DAE's escalator for "other materials and services" is already a composite escalator reflecting a split of 75% labour (WPI based) and 25% materials (CPI based). GAWB's application therefore double-counts the higher labour cost escalator. We do not support this approach. Instead, to escalate our recommended maintenance forecast to nominal values, we apply an escalator based on 70% of our revised labour cost escalator (WPI-based), and 30% based on the CPI.

Summary findings

Based on our assessment outlined above, our draft recommendation is to adopt GAWB's budgeted maintenance spend in 2019-20 as the baseline, plus a 10% buffer to allow for any legitimate need to increase maintenance spend over the forward period. As noted above, we consider actual maintenance spend in 2019-20 is a reasonable baseline, as it is below what was forecast in 2016.

We recognise that maintenance spend can be lumpy, and that our recommended expenditure profile is flat in $2018-19. However, the baseline we have adopted is well above the average maintenance spend in the prior years, and with the added 10%, we consider there is sufficient room for GAWB to re-priorities and shift expenditure around as needed during the period. Furthermore, we have not applied our recommended efficiency factor to the maintenance forecast, to ensure that the 10% buffer remains intact. The forecast maintenance spend has been escalated to nominal values as described above.

GAWB's GL data for maintenance also include two smaller cost items – 'weed & pest animal management' and 'materials – general'. We recommend accepting these forecasts in $2018-19 as they consist of relatively small amounts with minimal variation over the period. We recommend applying the CPI-based escalator to these cost items, and we recommend applying the efficiency factor.

Table 69: GAWB proposed maintenance opex and KPMG recommendation ($nominal)

	2021	2022	2023	2024	2025
GAWB proposal	4,011,609	4,310,804	3,791,468	4,202,996	4,132,407
KPMG recommendation	3,151,713	3,265,592	3,367,051	3,539,023	3,554,335
Difference	(859,896)	(1,045,211)	(424,417)	(663,973)	(578,072)

7.5.3 Electricity

Electricity expenditure forecasts and historical trends

GAWB's actual electricity spend in the current regulatory period was slightly lower than forecast through 2018/19. The annual growth rate of the actual cost of electricity incurred by GAWB was 7.55%

from 2015/16 to 2018/19, in nominal terms. This is estimated to be 5.79% in real terms, based on observed inflation in the same period.

The relatively significant increase in electricity costs over the period is consistent with the outcomes in Queensland energy sector. A number of factors contributed to the increasing level of wholesale electricity prices including the closure of coal plants[74], uncertainty around renewable energy policy and regulation of gas exploration.

In late 2017, the Queensland Government announced both its Powering Queensland Plan and its Affordable Energy Plan. These plans included a number of initiatives to put downward pressure on electricity prices and also to promote the transition to renewable sources of generation.

Consideration on current period electricity

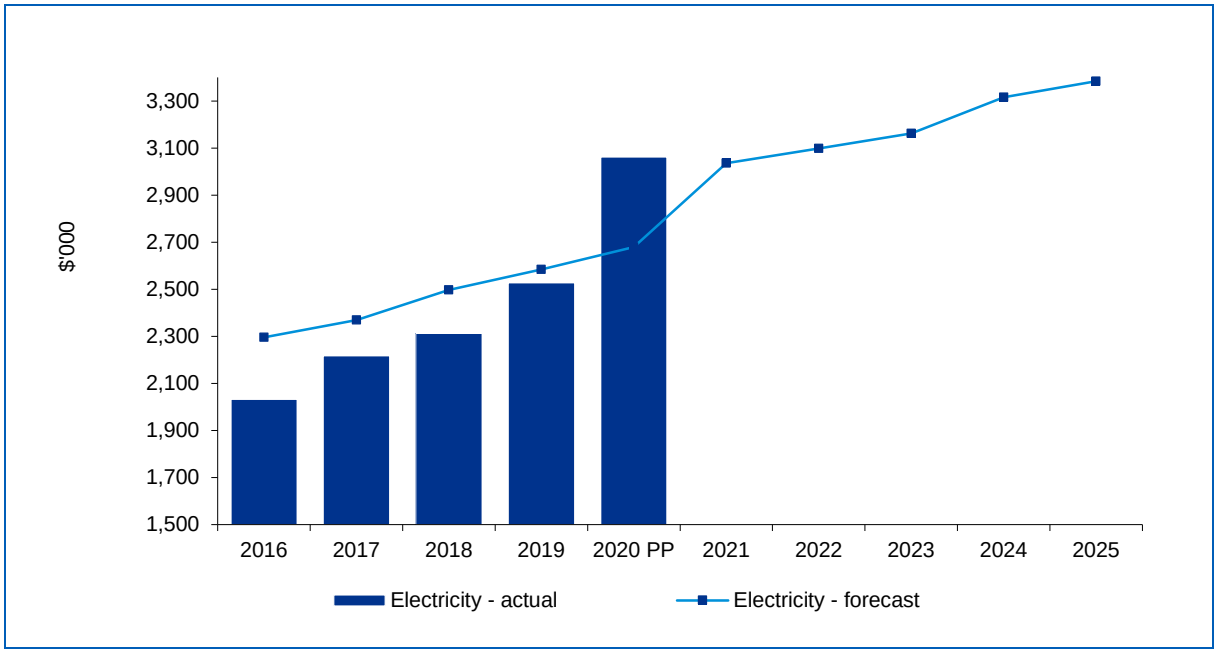
GAWB is estimating a 50% increase in total electricity costs from $2m to $3m over the five year regulatory period from 2016 to 2020. GAWB notes that this is largely due to increases in the cost of electricity. We understand that the expected 20% increase in 2019/20 is due to the commissioning of the Offline Storage Facility.

There are a number of concerns we have regarding this:

- Over the period from 2015/16 to 2019/20, the AEMC in its residential price trends considered that market offers have not grown. The estimated market offer for 2019/20 is $25.52 c/Kwh compared to $25.69 c/kwh (nominal).[75] Netting off the separate increase for the offline storage facility, GAWB is seeking an 25% increase over the same period
- There is not a corresponding increase in water volumes over this period to suggest that an increase in electricity consumption is behind the increase over the period
- GAWB notes that the extent to which electricity consumption can be optimised by GAWB to minimise total electricity costs over the period is limited. As noted in section 5.3, Jacobs expected GAWB to realise savings in electricity over this period due to risk management measures to limit adverse electricity market price movements and transfer of electricity consumption from peak times to off-peak. While the data provided by GAWB identifies a shift in electricity expenditure from peak to off-peak, the forecast also includes an 80% jump in peak expenditure in 2020.

[74] Swanbank E (385 MW) in Queensland was mothballed but has not actually return to service.
[75] See Figure A.3 AEMC Residential Price Trends 2016 Report, https://www.aemc.gov.au/sites/default/files/content/be91ba47-45df-48ee-9dde-e67d68d2e4d4/FINAL-REPORT%C2%A02016-RESIDENTIAL-ELECTRICITY-PRICE-TRENDS.pdf and Figure 2.2 AEMC Residential Price Trends 2020 Report, https://www.aemc.gov.au/sites/default/files/2019-12/2019%20Residential%20Electricity%20Price%20Trends%20final%20report%20FINAL.pdf

Table 70: Electricity forecasts and actuals



Source: GAWB 2019

Assessment of baseline costs

Setting the 2020 base at a reasonable level is important as forecast electricity costs have been derived using assumed escalators from that year.

We note GAWB's comments that it has taken measures to reduce its electricity costs by installing solar panels and replacing assets to improve operational performance. Despite this we consider that the 2020 forecast for electricity expenditure could be reduced by 15%. While the AEMC forecasts may not be a prefect indicator of GAWB costs due to the GAWB contracting strategy and the presence of separate Ergon network tariffs applicable to a number of GAWB connection points, the AEMC numbers are reflective of the cost trends in the Queensland energy sector. A prudent operator should be able to manage its electricity costs consistent with those trends. The suggested 15% reduction is conservative and provides an allowance for any specific drivers affecting GAWB.

Electricity costs forecasting approach

[redacted].

GAWB does not have a specific policy for the procurement of electricity. Retail agreements for GAWB's contestable sites are required to be sourced and executed in accordance with GAWB's procurement, authority and delegation policies. GAWB uses a broker to purchase electricity for its contestable sites. The broker obtains multiple proposals from vendors and presents at least five to GAWB to consider. Based on information provided we consider this process to be appropriate as it would allow GAWB to obtain electricity at competitive market rates.

GAWB has forecast electricity costs by identifying step changes in costs in 2020-21 as well as in 2023-24, and then applying an escalation factor to these base level expenditures.

Forecast drivers and assumptions

Total electricity costs are forecast to increase from $2,527,329 in 2018-19 (in nominal terms) to $2,914,372 in 2020-21 (in real $2018/19). This represents a CAGR of 7.38% in real terms. Based on the information provided it is not clear how the amount for 2020/21 has been derived, or if it reflects the expected fall in electricity prices forecast by for example EY and Acil Allen (see below under wholesale costs). The AEMC is forecasting a 6% reduction in residential electricity prices over next year.

The fixed portion of the costs are then forecast to remain constant in real terms between 2020-21 and 2024-25. The variable portion is forecast to increase by 0.93% in real terms, with a step change between 2022-23 and 2023-24. GAWB notes that an increase is anticipated in the years 2023-24 and 2024-25 to take account of the anticipated completion/operational date for UV at the water treatment plants. We note that this project has been deemed not prudent in the capex review by KPMG and that it be excluded from the capex forecasts.

Despite this, there is limited information on the drivers of the forecast real electricity costs. It is not clear if, or how, any expected changes in demand for electricity (e.g. total volume or timing of volume) affect the forecast real electricity cost, for example due to energy efficiency initiatives or operational changes.

The nominal price escalation factor applied to electricity is 2.06% from 2020-21 to 2024-25, based on analysis conducted by DAE. The electricity price escalation factor is -0.23% in real terms, relative to a CPI escalation factor of 2.30% provided by DAE.

Electricity costs have been escalated with reference to the following components:

- Wholesale costs
- Network costs
- Retail costs
- Green schemes
- Metering costs

DAE has taken the relative proportions for each category based on the AEMC 2018 Residential Electricity Price Trends report as indicative for the shares for GAWB. This is a reasonable approach, although, as noted by DAE, large users may have a large share of the costs in the wholesale component.

The AEMC has now just released its 2019 Residential Electricity Price Trends Report and therefore the escalator factors need to be updated. A key development is the draft determination by the AER of Ergon and Energex's network tariffs over the 2020 to 2025 period.

Market offers C/Kwh	2018/19	2019/20	2020/21	2021/22
AEMC 2018 Price trends	27.20	24.71	24.80	
AEMC 2019 Price Trends	27.20	25.52	22.25	21.90

Wholesale costs

- DAE has relied on modelling undertaken by EY for the AEMC to estimate wholesale costs, which forecasts a drop in wholesale prices from 2017/18 to 2019/20 and then prices remaining flat in 2020/21. DAE notes modelling undertaken by Acil Allen by the QCA, but it does not reflect this in its analysis.
- The AEMC is now expecting an 11.6% fall in generation prices in QLD between this year to 2021/22, with all this increase to incur over the first two years of GAWB's next regulatory period. This is driven by the influx of committed renewable generation including 595 MW of solar and 496 MW of wind. New renewable generation mean that prices of electricity are lower during peak renewable production periods, which may lead to lower wholesale electricity purchase costs depending on the hedging profiles of retailers.

Network costs

- Distribution costs are currently set to July 2020, with the next regulatory period from 1 July 2020 until 30 June 2025. Ergon Energy has proposed significant reductions in distribution prices for the next regulatory period, with network charges forecast to fall 4.5% in real terms from 2019/20 to 2020/21. DAE has incorporated this information to adjust the broader distribution cost forecast

provided by the AEMC, and assumes that distribution costs will fall from 9.79 c/kWh in 2018/19 to 9.31 c/kWh in 2021/22, a decline of 4.9%, and then remain constant in real terms. It is not clear exactly how DAE has derived the 4.9% decline.

- We note that since the DAE report, the AER has released its draft determination with regard to Ergon Energy which provides for a lower revenue allowance than that proposed by Ergon Energy. AEMC has estimated that this will result in reduction for .79 c/kWh in 2018/19 to 8.08 c/kWh in 2021/22. This represents a further 1.23 c/kwh or a further 12.5% reduction on top of the 4.9% estimated used by DAE
- Transmission costs are currently set until 30 June 2022, with allowable revenues to change by CPI – 0.15% on 1 July 2018, 2019, 2020 and 2021. However, the cost of debt, which affects the allowable revenues, has fallen since the decision with the actual change on 1 July 2018 being CPI – 0.47% and on 1 July 2019 CPI – 0.36%. DAE has assumed that a reasonable forecast is for the allowable change in revenue to be around CPI – 0.50% in 2020 and 2021. However, given that a change in allowable revenue is broader than a change in prices, DAE considers it reasonable that prices will not change in nominal terms until July 2022, after which they remain constant in real terms. We consider this approach to be reasonable given that there is no new information available about Powerlink charges over the period.

Retail costs

- Retail costs are forecast to increase from 6.79c/kWh in 2018-19 to 7.14c/kWh in 2020-21, based on information from the AEMC from the 2018 Price Trends Report on South East Queensland. Beyond 2020-21, DAE has assumed that retail costs remain constant in real terms. While this was a reasonable approach given the relatively competitive nature of the retail electricity market, the AEMC is now expecting an over 50% reduction in the current year under reforms introduced by the COAG Energy Council to introduce a default market offer.[76]

Green schemes

- Green scheme costs are forecast to fall from 1.62c/kWh in 2018-19 to 1.48c/kWh in 2020-21, based on information from the AEMC's 2018 Price Trends Report. DAE have assumed that green scheme costs remain constant in real terms beyond 2020-21. We note that the underlying LGC prices in the AEMC's report, estimated by EY, are directly linked to their wholesale price forecasts, as it is estimated as the fair value of the subsidy required for a new entrant renewable generator entering into a PPA to recover its fixed and variable costs. This value could deviate notably from the market price of LGCs going forward, as the LRET is met and supply exceeds demand. There is of course however also significant uncertainty as to the future of environmental policies in Australia going forward, and new green or environmental policies may counteract this impact.

Metering

- Metering costs are forecast to increase from 0.86c/kWh in 2018-19 to 0.89c/kWh in 2020-21, based on information from the AEMC's 2018 Price Trends Report. Beyond 2020-21, DAE have assumed that the metering costs are constant in real terms. While this was reasonable approach at the time of submission, the AEMC is now estimating a reduction to 0.58 c/kwh from 2020 onwards.

Assessment of the application of escalators

Since the GAWB pricing submission, two key developments have provided evidence to point to lower electricity costs over the period. The AER has made a draft determination on QLD distribution network

[76] https://www.aer.gov.au/retail-markets/retail-guidelines-reviews/retail-electricity-prices-review-determination-of-default-market-offer-prices

tariffs, and modelling by the AEMC is forecasting lower wholesale prices due to increase entry of renewables. These two cost categories account for over 75% of the retail prices.

Based on analysis conducted by DAE, GAWB forecasts include:

- A 2.06% nominal price escalation factor applied to fixed charge proportion of electricity expenditure. Fixed charges account for 27% of GAWB total forecast
- A 3% nominal price escalation factor applied to variable charge proportion of electricity expenditure. Variable charges account for 73% of GAEB total forecast

It has been impossible for us to replicate and update the DAE methodology for determining these escalation factors. However it is clear that there should be decreases in both these costs components based on the available evidence. We also recognise that there is a lot of uncertainty on future electricity prices and that the AER is still to make its final determination on network tariffs which could deviate from the draft determination.

At this stage, we are recommending the following escalation factors to be used instead.

- A 7.5% reduction in fixed charges over the 2020/21 and to remain flat in nominal terms for the rest of the period. Fixed charges are mainly network charges and the AER is approximately estimating the small business customers will see at least a 15% nominal reduction in bills over the next five years (3.5% in real terms[77]). We consider it is reasonable that 50% of this expected savings is pass through to GAWB
- An annual 4% decrease in nominal variable over the first two years of the next period. Costs to be remain constant in nominal terms for the rest of the period. This is a conservative assumption given the expected falls in network and wholesale prices.

Summary findings

Based on limited information provided by GAWB, it is not clear what drives the step increases in electricity costs between 2018-19 and 2020-21, and again in 2023-24. In lieu of more detailed information, our opinion is that the forecasts are overly conservative and need to reflect new evidence which shows likely reductions in wholesale and network costs over the next period.

We are proposing two reductions:

- A 15% reduction in 2020 base year
- Applying revised escalation factors for fixed and variables electricity costs to reflect recent AER and AEMC reports
- No allowance for the 2023/24 step change as there is no information provided to support this

The QCA could review the overall pricing monitoring arrangements to ensure that GAWB has sufficient incentives to manage and optimise its electricity consumption and expenditure. There may be some merit in exploring technologies to become more energy efficient or distributed generation to have greater control over their costs.

The AER will make its final determination on Queensland by 30 April 2020. If time permits, the QCA should consider making any adjustments to GAWB forecast electricity allowance to account for differences between the AER draft and final determinations.

[77] https://www.aer.gov.au/system/files/AER%20-%20Energex%202020-25%20-%20Draft%20decision%20-%20Overview%20-%20October%202019_0.pdf p.9 AER Draft Decision Overview

Table 71: GAWB proposed electricity opex and KPMG recommendation ($nominal)

	2020	2021	2022	2023	2024	2025
GAWB proposal	3,061,495	3,035,681	3,098,216	3,162,039	3,315,764	3,384,069
KPMG recommendation	2,602,270	2,473,668	2,400,634	2,400,634	2,400,634	2,400,634
Difference	**(459,224)**	**(562,013)**	**(697,582)**	**(761,406)**	**(915,130)**	**(983,435)**

7.5.4 Chemicals

Chemical expenditure forecasts and historical trends

Chemicals are required for treating water and constitute a key part of the operating costs. A range of chemicals are used in different parts of the supply chain to disinfect and to remove particles, other chemical odours and tastes. The demand of chemicals is largely related to the total volume of water supplied, operational requirements and other factors such as regulatory requirements. Chemical prices can fluctuate due to local and global market forces. The common chemicals that are utilized by GAWB include[78]:

- Magnafloc LT
- Dense Soda Ash
- Liquid Alum TIF
- Sodium Hypochlorite 13%

GAWB's chemical costs in the current period were substantially lower than what was forecast in the 2015 regulatory review. Actual expenditure from 2016-19 shows a strong decline in trend with a CAGR of -4.56%.

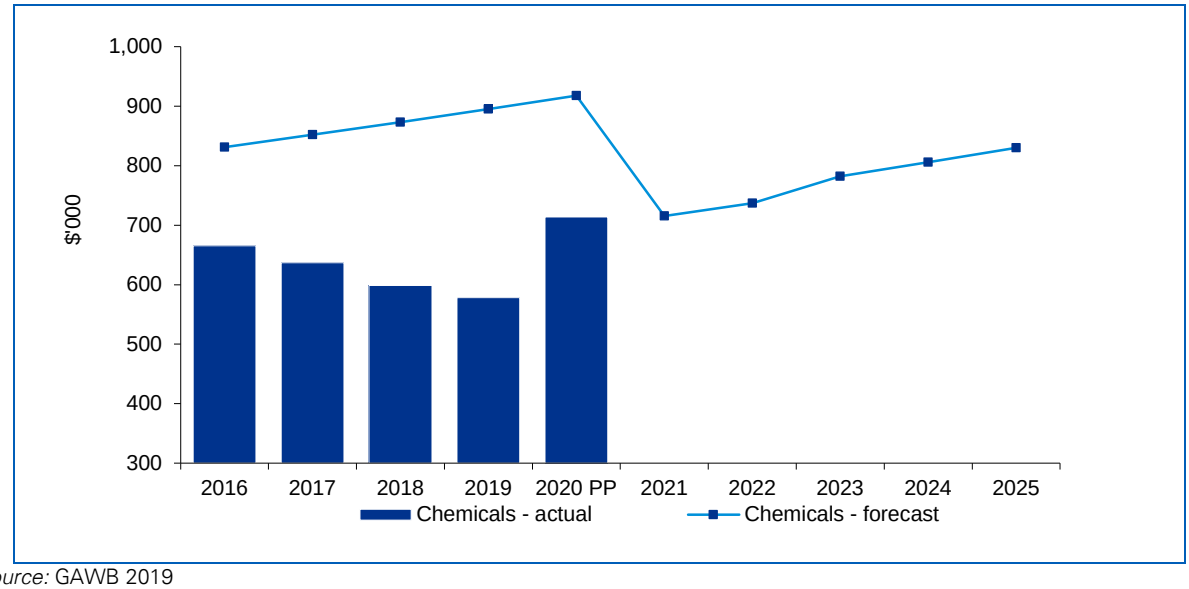
Table 72: Actual chemicals ($m, nominal)

	2015-16	2016-17	2017-18	2018-19	2019-20
Chemicals Forecast	0.83	0.85	0.87	0.89	0.91
Chemicals Actual	0.66	0.63	0.59	0.57	0.71
Variation %	-20%	-25%	-31%	-35%	-22%

GAWB noted that the lower chemical costs compared to the forecast at the time is due to one or more of the following factors - low level of inflows, limited severity of weather events (i.e. cyclones or significant weather depressions can result in high levels of turbidity) and limited presence of blue green algae.

[78] Deloitte Access Economics, Cost escalation factors (2020-21 to 2024-25) Prepared for Gladstone Area Water Board August 2019

Figure 22: Chemicals forecasts and actuals



Source: GAWB 2019

Chemicals forecasting approach

GAWB did not provide details on its forecasting methodology in response to our request. GAWB however noted that its forecast chemical costs are derived on the same basis as in the previous reviews when there was a more normal distribution of weather events. Based on our understanding of the information provided for the previous reviews, GAWB develops its forecast using a bottom-up build of chemical quantities based on historical usage and the expected cost of purchasing these chemicals.

Assessment of baseline costs

In determining the reasonableness of the base year costs we compared the forecast that GAWB proposed for the 2018/19 year in the previous review against the actual chemical costs. Based on the information provided it is noted that the chemical costs are much lower than what was forecasted previously. GAWB notes that this is due to unusual weather conditions resulting in lower demand for chemicals.

Given this and based on the limited information provided, we consider that the base year costs of 2018/19 are not unreasonable.

Forecast drivers and assumptions

GAWB forecast that its chemical expenditure costs will increase to $0.71m in 2020-21 to $0.83m by the end of the regulatory period. GAWB submits that actual consumption in the current regulatory period is not an appropriate basis for forecasting chemical costs given the inherent variability in weather condition which is outside GAWB's control.

Table 73: Forecast chemicals ($m, nominal)

	2020-21	2021-22	2022-23	2023-24	2024-25
Chemicals Forecast	0.71	0.73	0.78	0.80	0.83
YoY % change		3.03%	6.09%	3.03%	3.03%

With regard to determining the prudency we note that given the criticality of chemicals in the supply chain process we find this expenditure to be prudent.

With regard to efficiency we note that GAWB has not provided a detailed breakdown of historic actuals and forecasts by prices and volumes that would allow KPMG to determine whether the assumed

forecast costs are efficient. While GAWB notes that the chemical costs proposed are in line with previous reviews on the assumption that weather conditions will be normal, GAWB has not provided the basis for this assertion.

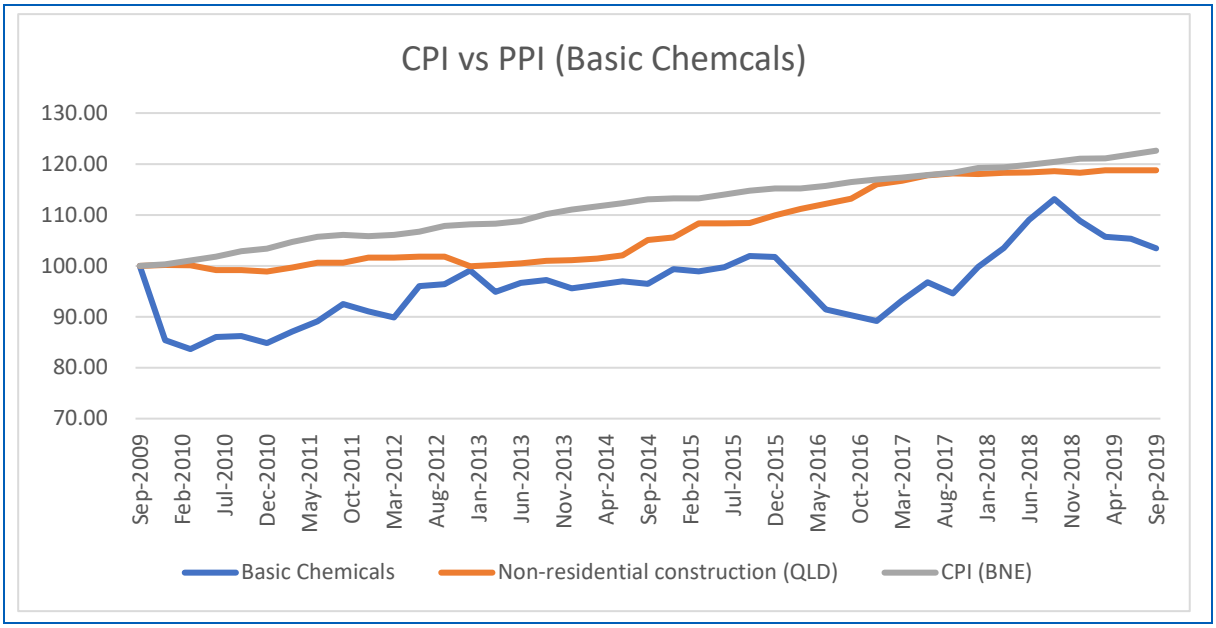
Further we note that in determining its forecast for chemical costs GAWB states that it applied a price escalation index of 3.03%, in line with DAE's recommended escalation factor. When examining the forecast, we found the growth in three of the years to be consistent with the DAE escalation factor. The higher growth rate between 2018-19 and 2020-21 is likely to reflect increased volumes, in line with GAWB's submission. However, there appears to be another step change in 2022-23, which is not explained. We note that the increase does not correspond to an increase in metered volumes.

Assessment of the application of escalators

For the 2015-20 Regulatory review, the QCA used an escalation factor—based on the 10–year average of the Producer Price Index (PPI) for Output of the Manufacturing Industries (Basic Chemicals). DAE noted that the PPI for basic chemicals and chemical products, while volatile, has been positively correlated with movements in crude oil prices (with crude oil prices leading by one year). DAE forecasts crude oil prices as a part of its regular modelling processes, and therefore changes in crude oil prices (lagged by one year) are forecast to drive cost escalation factors for chemicals from 2019-20 onwards.

Current commentary views the Australian Inorganic Chemical Manufacturing industry to grow at a weak rate over the next five years (based on the chemicals used by GAWB we consider the inorganic chemical manufacturing outlook most applicable to GAWB). IBIS (2019)[79] notes that the growth in this sector is hampered by ongoing structural changes in Australia's wider chemical sector and subdued demand from its consumer base. Competition from imports is anticipated to increase over the period, adding to the industry's pressures. Industry revenue is projected to grow at an annualised 0.9% over the five years through 2023-24, to reach $2.5 billion.

Figure 23: CPI (Brisbane), PPI (Basic Chemicals and Non Residential Construction (QLD)



Source: KPMG Analysis

Figure 23 shows that the PPI (chemicals) has been much lower than CPI over the past decade, in line with the commentary by IBIS. Given this and the outlook for the Inorganic Chemical Manufacturing industry we are concerned that the cost escalator proposed DAE and applied by GAWB is high. We

[79] https://www.ibisworld.com.au/industry-trends/market-research-reports/manufacturing/basic-chemical-product/basic-inorganic-chemical-manufacturing.html

consider GAWB should provide further justification if it is to escalate chemical costs by more than forecast changes in the CPI.

We have also analysed the forecast chemical cost relative to demand (metered volumes). Considering the % change in cost per ML, as shown in the table below, we see that the increase in chemical costs is generally not fully proportionate to growth in metered volumes (since the growth rate is less than 3.03% in most years). Again we observe a step increase in costs in 2022-23, which is unexplained.

Table 74: GAWB proposed chemical costs by volume ($nominal)

	2020-21	2021-22	2022-23	2023-24	2024-25
Chemicals Forecast ($m)	0.71	0.73	0.78	0.80	0.83
Metered volumes (ML)	50,359	50,604	50,690	50,777	50,865
$/ML	14.21	14.57	15.43	15.87	16.32
% change/ML		2.5%	5.9%	2.9%	2.9%

We sought data on chemical costs from other water businesses in Australia in order to benchmark GAWB's proposed costs. We obtained data on forecast chemical costs and actual volumes delivered by Hunter Water over the 2016-2019 period, shown in Table 86 below ($2018-19). The table shows that relative to Hunter Water, GAWB's proposed chemical costs per ML delivered is nearly double that of Hunter Water. While there are important differences in the operating environments and in the services delivered by GAWB and Hunter Water, the substantial cost differences may warrant further investigation.

Table 75: Chemicals by volume ($2018-19)

	2016-17	2017-18	2018-19	2020-21	2021-22	2022-23	2023-24	2024-25
Hunter Water chemical costs ($m)	0.50	0.49	0.56					
Hunter Water volumes delivered (ML)	73,237	67,034	72,291					
Hunter Water $/ML	6.85	7.27	7.75					
GAWB $/ML				13.38	13.32	13.69	13.67	13.64

Summary findings

The proposed expenditure by GAWB for chemicals is assessed as being prudent as chemicals are required in the treatment of water and the quantity used is dependent on demand and the quality of the raw water.

With regard to the efficiency of costs, GAWB has not provided a detail breakdown of chemicals historic actuals and forecast by prices and volumes or on what basis it is assuming the return of normal weather conditions to determine the forecasts for chemical costs. However, we note that the forecast costs are lower than the costs accepted by Jacobs in the previous review, also after accounting for price increases and higher forecast of water volumes to be supplied in the upcoming period.

Nevertheless, given the current outlook for the chemicals market, we consider the cost escalation factor provide by DAE and used by GAWB is likely to be high. Furthermore, GAWB has not provided any explanation of the step increase in chemical costs in 2022-23. Our draft recommendation is

therefore to maintain GAWB's chemical costs at 2020-21 levels in $2018-19 terms, and that costs be escalated by forecast CPI only. Given the historical price trend and chemicals market outlook, we consider applying the CPI will provide a sufficient margin for GAWB to absorb any unforeseen chemical price increases.

Table 76: GAWB proposed chemicals opex and KPMG recommendation ($nominal)

	2021	2022	2023	2024	2025
GAWB proposal	715,463	737,142	782,014	805,709	830,122
KPMG recommendation	695,467	709,306	725,691	741,584	757,825
Difference	(19,996)	(27,836)	(56,323)	(64,125)	(72,297)

7.5.5 Employment costs

Employment expenditure forecasts and historical trends

Employment costs are one of the most significant contributors to total operating expenditure proposed by GAWB. For example, in 2020-21, employment costs comprised 38% of GAWB's forecast opex. These costs include such things as salaries, wages, superannuation, leave, penalty and overtime payments.

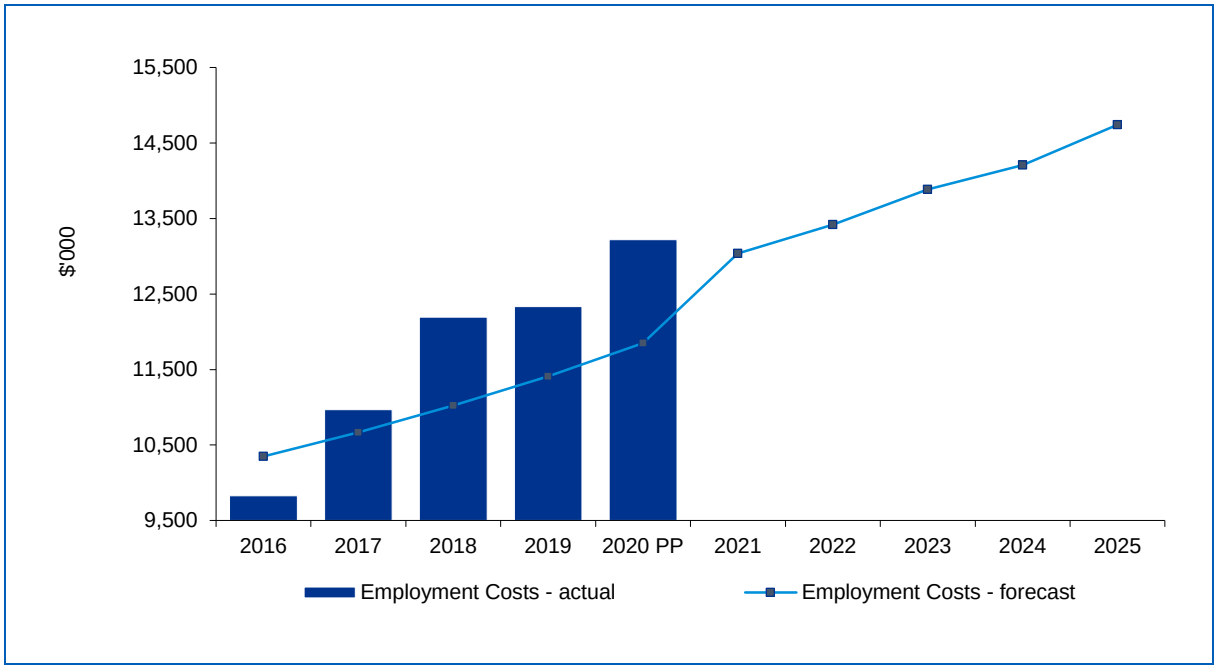
Employment costs incurred in the current period materially exceeded the 2016 forecast. CAGR between 2015-16 and 2018-19 was 7.9%, with the high growth in employment costs driven primarily by significant increases in net payroll costs[80] by $2.0m or 21.2% from $9.3m in 2015-16 to $11.2m in 2018-19. Labour hire costs and training costs also saw significant increases over the period, with CAGRs of 28.1% and 8.1% respectively, for a total increase in annual costs of $302k by 2018-19. In its submission, GAWB stated that:

> "…staffing numbers increased over the 2016-20 period in response to the embedding of the LCMP process and the increased size of the capital program. The delay in the recovery of efficiencies associated with the identified business process improvement investments also contributed to the increase in staffing costs."[81]

For the forward period, GAWB is forecasting a step increase in employment costs between 2018-19 and 2020-21 by $701k or 5.7%, from $12.3m to $13.0m. Employment costs are then forecast to continue to increase with a CAGR of 3.1% between 2020-21 and 2024-25. Key drivers of the forward increase in employment costs include net payroll costs continuing to grow with a CAGR of 3.22%, and recruitment costs which increases with a CAGR of 10.67% over the period.

[80] We define 'Net payroll costs' as total payroll expenses less capitalised payroll expenses.
[81] GAWB, Price submission to the QCA – 2021-25 period, p 93.

Figure 24: Employment forecasts and actuals



Source: GAWB and KPMG analysis

Employment forecasting approach

GAWB have indicated that forecasts are based on the following:

- Forecast to reflect approved roles with 100% of roles filled
- Limited if any time period between resignation and recruitment
- Any roles currently filled via a labour hire arrangement will be replaced by a GAWB employee
- Reflective of contractual obligations – GAWB does not have an EBA. Permanent employees (excluding Executive Team Leaders) are required to enter in GAWB's standard employment contract. See Employee Remuneration & Reward Policy for full details.
- Reflective of contractual terms (i.e. if a short term hire then the role is only forecast for the applicable period, it is not assumed to be rolled over for another period).

GAWB appears to be basing forecasts on combination of bottom up and extrapolation of current costs, and using the escalation factors estimated by DAE.

Assessment of baseline costs

As shown above, GAWB's actual employment costs in the current period were above the 2016 forecast, which GAWB explains was largely due to increased staffing numbers associated with the LCMP process and the greater capital program, along with a delay in recovery of expected efficiencies.

While using 2018-19 levels as the baseline would therefore be higher than efficient levels, we consider it a reasonable starting point when adopted in conjunction with our recommended efficiency factor. Applying the efficiency factor to the employment forecast is appropriate given the expected efficiencies in employment costs that have not yet been realised. By the end of the period, GAWB's total employment costs would effectively be reduced back down to 2016-17 levels in real terms.

We note that in $2018-19 terms, GAWB's forecast for the period remains within 1% of total employment cost in both 2017-18 and 2018-19. Our recommendation is therefore to accept GAWB's forecast and apply the efficiency factor to GAWB's own forecast.

Forecast drivers and assumptions

Employment cost forecasts are dominated by forecasts of net payroll costs. We note that GAWB forecasts labour hire costs to decrease from 2018-19 levels, down $373k or 78% over the period, from $479k in 2018-19 to $105k in 2024-25, in line with GAWB's intent to fill current labour hire roles with GAWB staff.

GAWB has forecast training costs to be significantly higher in 2020-21 relative to the 2018-19 base year. However, training costs are forecast to decline over the period, and while it will remain higher than in 2018-19, average training costs in the forward period is approximately the same as during 2016-19, when ignoring price effects.

Number of employees (FTEs)

Employment costs (specifically net payroll costs) are a function of both wage levels and the number of employees (typically measured as full time equivalents (FTEs)). GAWB is forecasting FTE numbers to decline over the period from approximately 105 in 2018-19 to 100 in 2024-25.

The general forecast decline in FTEs from 2018-19 levels is consistent with the modest proposed CAGR of 2.9% for combined net payroll and labour hire costs from 2018-19 through to 2024-25, below DAE's proposed escalation factor of 3.22% for labour costs over the 2021-25 period.

Table 77: GAWB FTE forecasts

	2019	2021	2022	2023	2024	2025
Total FTEs	105.80	101.00	101.00	101.00	100.00	100.00

Assessment of the application of escalators

GAWB does not have an enterprise bargaining agreement and as such does not impose negotiated wage growth on its forecasts. GAWB has applied DAE's recommended escalation factor for labour costs, which is the sum of forecast Qld WPI and a premium based on recent differences between the QLD WPI for the public and private sector. DAE forecasts that the premium will gradually disappear over the forecasting period.

Other cost items included in employment costs have been escalated on the basis of forecast CPI, except for labour hire which is escalating using DAE's proposed escalator for contract labour costs (based on QLD WPI forecast).

We consider these approaches reasonable, and have reflected this in our recommended updated escalation factors.

Summary findings

As explained above, our draft recommendation is to adopt GAWB's forecast employment costs, but apply our recommended efficiency factor to employment costs. Our full recommended efficiency adjustment for opex is shown in Table 59 in section 7.1.

Table 78: GAWB proposed employment opex and KPMG recommendation ($nominal)

	2021	2022	2023	2024	2025
GAWB proposal	13,036,958	13,419,393	13,886,803	14,206,418	14,742,123
KPMG recommendation (not including efficiency adjustment)	12,940,634	13,319,204	13,822,598	14,144,939	14,676,887
Difference	(96,324)	(100,189)	(64,206)	(61,479)	(65,236)

7.5.6 Rates

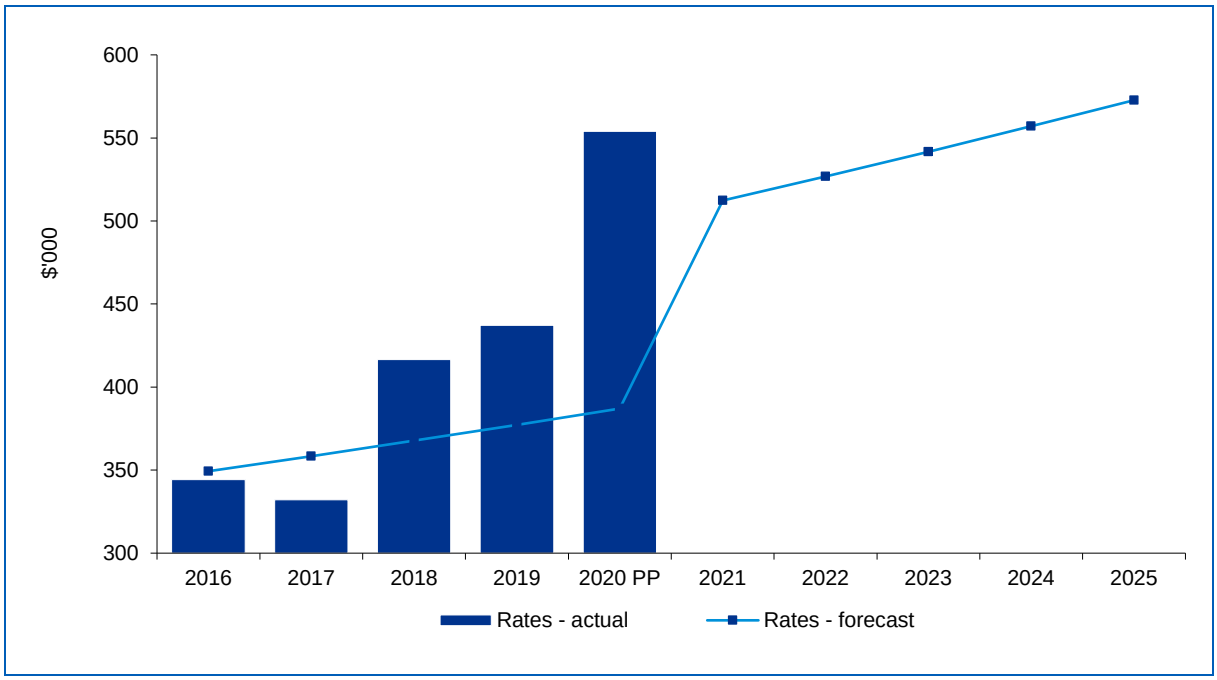
Rates expenditure forecasts and historical trends

GAWB's actual rates paid to the GRC were materially above the forecast for the previous period. This is because the GRC's actual rates were higher than forecast. The CAGR actuals for 2016-2020 is 12.63% which is a significant increase over the period. The largest divergences between the forecast and actuals is in the budgeted spend for 2019-20 as the Council's current rates are much higher than anticipated at the time of the previous price review.

Table 79: Actual Council Rates ($nominal)

	2015-16	2016-17	2017-18	2018-19	2019-20
Rates Forecast	349,323	358,405	367,724	377,285	387,094
Rates Actual	344,204	332,166	416,481	437,153	553,888

Figure 25: Rates forecasts and actuals



Source: GAWB 2019

Rates forecasting approach

GAWB pays rates to the Gladstone Regional Council (GRC). Rate paid to Councils help council to fund community services, sporting and recreational services and facilities for the community.

For the upcoming regulatory period GAWB is proposing to use DAE's proposed escalator of 2.82%. We agree with DAE's approach to calculating the escalation factor, and used this approach in calculating the revised escalation factor using up-to-date inputs.

Assessment of baseline costs

Council rates paid by GAWB are considered uncontrollable and GAWB has forecasted the rates it pays to the Council to continue to increase between the two regulatory periods. GAWB is forecasting the base year costs to be less than the current costs incurred by GAWB. Given this we consider the base year forecast cost of 2020/21 to not be unreasonable.

Forecast drivers and assumptions

In forecasting cost escalation factors for council rates, Deloitte Access Economics has taken into account the four cost categories of GRC and the weights from the 2017-18 GRC Annual Report:

- Materials and services: materials and services comprises both the use of labour and material inputs. DAE has assumed that the 75% weight for labour and 25% for materials is similarly appropriate for the GRC, with Queensland WPI and CPI relevant to future cost increases respectively.
- Employee costs: DAE has assumed future cost escalation factors for GAWB are reasonable in forecasting future changes in GRC's employee costs. That implies wage increases exceed Queensland WPI in the short-term, before converging in the mid-2020s.
- Depreciation & amortisation: depreciation and amortisation costs reflect the value of the asset and its useful life. The nominal value of assets will increase over time with broader inflation. DAE has therefore forecast changes in this component to increase with Queensland CPI.
- Finance: finance costs are forecast to increase over time, with more debt taken on and with rising prices, which over time will necessitate larger nominal loans. Finance costs are forecast to increase over time with Queensland CPI.

An alternative escalator is the Council Cost Index (CCI) produced by the Local Government Association of Queensland (LGAQ). The CCI is a weighted index of the WPI (50%), road and bridge construction index (30%) and CPI for Brisbane (20%). We consider that the CCI is not an appropriate escalator for GAWBs council rates as the Local Government Cost Index provides an aggregated picture of cost movements at the State level. The mix of construction and non-construction activity varies from council to council. Similarly, there are parts of the State where construction costs have been increasing faster than the State average. Such factors will all be of relevance at the local level when determining the level of rate increase necessary to provide the desired level of service.

Summary findings

KPMG recommends that GAWB's proposed forecasts for rates be accepted, with the application of an updated escalator. We have updated the escalator for rates to reflect more up to date data on the proportion of costs in each cost category as presented in the GRC 2018-19 Annual Report.

Table 80: GAWB proposed rates opex and KPMG recommendation ($nominal)

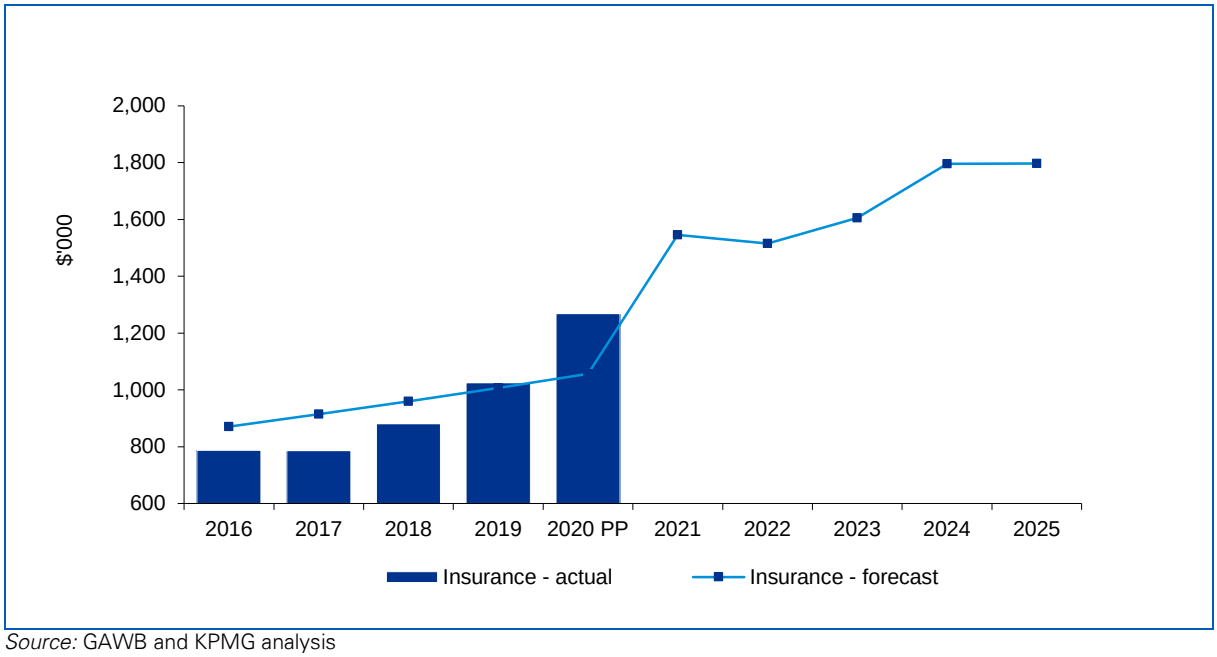
	2021	2022	2023	2024	2025
GAWB proposal	512,406	526,855	541,713	556,989	572,696
KPMG recommendation	506,321	519,538	534,788	549,385	564,328
Difference	(6,085)	(7,317)	(6,925)	(7,604)	(8,368)

7.5.7 Insurance

Insurance expenditure forecasts and historical trends

GAWB's insurance costs in the current period started below forecast in 2015-16, but grew rapidly between 2015-16 and 2018-19 with a CAGR of 9.2%, well above inflation for the period. GAWB's forecast sees a considerable step increase between 2018-19 and 2020-21, up $520k from $1.0m in 2018-19 to $1.5m in 2020-21. This follows GAWB recent negotiation of insurance, which saw a dramatic increase in the insurance price. From 2020-21 onwards, insurance costs is forecast to increase a further $251k to $1.8m, reflecting a CAGR of 3.8%.

Figure 26: Insurance forecasts and actuals



Source: GAWB and KPMG analysis

Insurance forecasting approach

GAWB states that it has applied the DAE escalation factor to its most recent negotiated insurance outcome to develop its insurance cost forecast, along with inclusion of cost of periodic asset valuation. GAWB also submitted late in our review process that there is a step change in costs between 2019-20 to 2020-21 to take account of the requirement to have cyber insurance. The late timing of this information prevented us from making an informed assessment at this stage of the prudency and efficiency of this claim.

Assessment of baseline costs

As the budgeted insurance spend in 2019-20 is based on GAWB's actual cost of insurance following recent procurement through a broker, we consider this is a reasonably efficient baseline for forecast insurance costs.

Forecast drivers and assumptions

Due to the specialist nature of this service and to ensure GAWB gets the most efficient price, a broker is used to source quotes from appropriate insurance providers on an annual basis. Based on information provided we consider this process to be appropriate as it would allow GAWB to obtain insurance at competitive market rates.

As noted above, GAWB's forecast also includes costs associated with periodic asset valuation and taking out cyber insurance from 2020-21 onward. While the amounts and frequency associated with asset valuation appear reasonable, the late timing of the information provided on cyber insurance prevented us from making an assessment at this stage.

Assessment of the application of escalators

The nominal price escalation factor estimated by DAE is 5.70% from 2020-21 to 2024-25. DAE considers it likely that future insurance price increases will continue to exceed that of broader CPI growth, including due to climate-related risks. However, DAE found it very difficult to accurately track changes in the 'price' of insurance, because of changes in categories of insurance, changing asset values and scope of insurance taken out and so on. This made it impractical to generate 'price' series for the different types of insurances taken out.

DAE estimates the nominal cost escalation factor of 5.7% based on CPI growth (i.e. 2.3%) plus the observed 3.4% historical premium. DAE notes that the 3.4% premium is calculated based on the ABS's detailed CPI data on insurance (5.5%), relative to Brisbane CPI between 2008-09 to 2018-19. There is no clear motivation provided for the use of the 10 year time frame for calculating the historical premium, and we note that the premium varies with both a shorter and a longer time horizon.

We agree that climate related risks in particular will mean that it is likely that future insurance price increases will continue to exceed that of broader CPI. That said, it is very difficult to predict the cost of insurance going forward, not least in the context of a changing climate. According to the October 2019 RBA Financial Stability Review, inflation-adjusted insurance claims for natural disasters in the current decade have been more than double those in the previous decade, and this impact is likely to grow over time. We note that this is likely to flow through to higher insurance costs.

Whilst DAE acknowledges that the basket of insurance policies taken out by GAWG may not align perfectly with the policies that reflect the CPI insurance category, DAE notes that broad drivers of prices in the insurance market are similar across different insurance markets.

We note that 58% of insurance spend in 2018-19 was related to industry special risk (ISR), which is not likely to be the case for the broader insurance category. We also note that the locations of GAWB's assets may be associated with different types of risks compared to the overall basket of insurance policies. One way to mitigate this might be to give some weight to the historical overall insurance premium incurred by GAWB, or, if possible, other comparable businesses, relative to CPI over the last 10 years, as well as the premium for the general insurance category in Brisbane.

GAWB has forwarded advice from its broker regarding expected increase to premiums in the near future, however the late timing of this information has again prevented us from making an informed assessment for this draft report.

Summary findings

Our draft recommendation is to adopt GAWB's budgeted insurance spend in 2019-20, escalated by our updated escalator, plus the forecast costs associated with asset valuation in 2020-21 and 2023-24.

Table 81: GAWB proposed insurance opex and KPMG recommendation ($nominal)

	2021	2022	2023	2024	2025
GAWB proposal	1,545,562	1,515,566	1,605,074	1,795,518	1,796,754
KPMG recommendation	1,436,574	1,403,298	1,483,426	1,652,588	1,653,909
Difference	(108,988)	(112,268)	(121,648)	(142,929)	(142,845)

7.5.8 Information systems

Information systems expenditure forecasts and historical trends

GAWB's actual expenditure incurred in the current regulatory period is significantly higher than what was forecast at the time. The CAGR of actuals between 2016-20 is 39.66% showing a dramatic increase in IT costs over the regulatory period. Based on the detail provided by GAWB the increase in IT costs are primarily driven by a significant increases in software maintenance (non-contract) which increased from $421,373 in 2016 to $2,519,500 in 2020. As discussed in this section, this is reflective of a general trend amongst utilities of transition to more licenced based applications than investing in capital IT systems.

Table 82: Actual IT expenditure ($m, nominal)

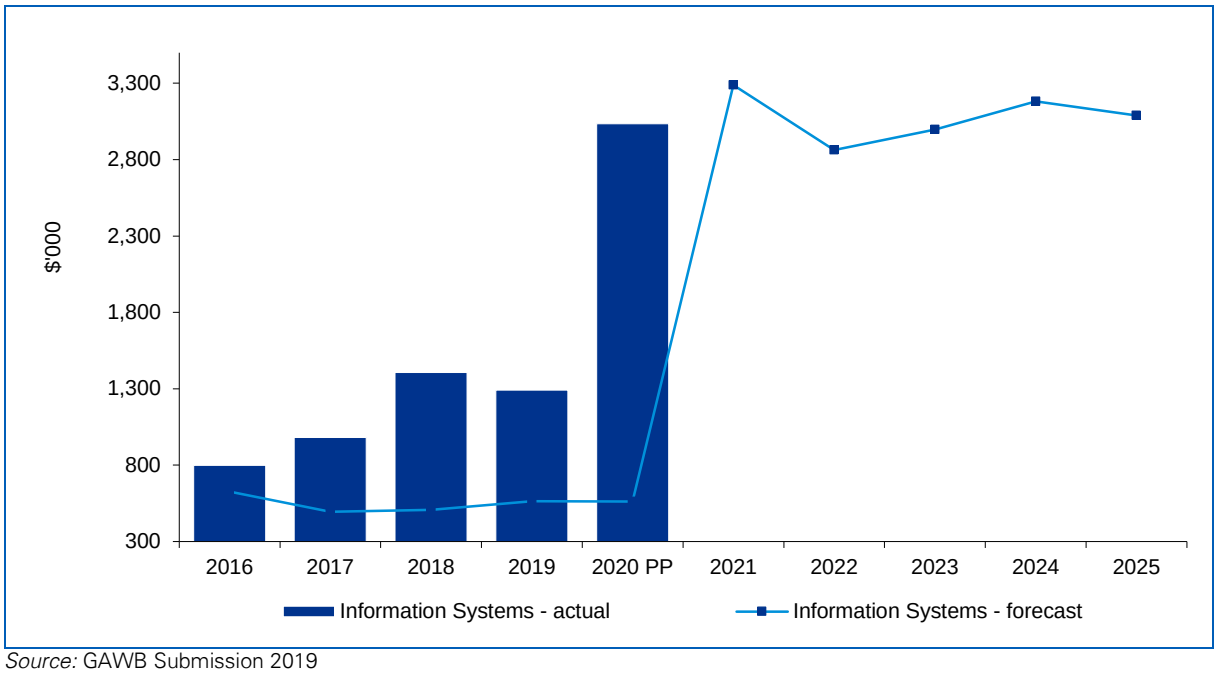
	2015-16	2016-17	2017-18	2018-19	2019-20
ICT Forecast	0.62	0.49	0.50	0.56	0.56
ICT Actual	0.78	0.98	1.4	1.29	3.04
Variation %	**28%**	**98%**	**177%**	**129%**	**440%**

GAWB has recently completed and approved an IT Strategic Plan which sets the direction for GAWB's transformation to an ICT as a service environment over the 2019-2024. GAWB notes that at the time of the last price review, it was not at a stage where the scope and timing of work required could have been reasonably predicted with any certainty. Therefore it has absorbed these additional costs in the current pricing period.

Some of this transformation set out in the Plan, including the migration to cloud-based services, commenced during the current regulatory period which is why there is an increase compared to the forecasts.

Another contributing factor to the unexpected increase in GAWB's information systems expenditure during this period was the implementation of GAWB's new Enterprise Resource Planning (ERP). Upon migrating to the new system in 2016, it became evident that further changes were required to leverage additional value from the new system. This included the purchase of additional modules, for example, an enterprise asset management module to support GAWB's strategic asset management capability and ISO-accredited asset management approach.

Figure 27: Information systems forecasts and actuals



Source: GAWB Submission 2019

A number of internal and external factors have been identified by GAWB as drivers for change. In particular, GAWB notes that in response to the Independent Commission of Audit's recommendations, the Queensland Government accepted the following recommendations and developed the Queensland Government Cloud Computing Strategy:

- That government adopt an ICT-as-a-service strategy and source ICT services, especially commoditised services, from private providers in a contestable market where this is feasible and represents value for money; and

- Government utilise as appropriate cloud-based computing and other emerging technologies as enablers to complement its ICT-as-a-service strategy.
- GAWB further notes that as a statutory authority, GAWB is required to align with this strategy, therefore future ICT related activities need to take account of the requirement to:
  - Take a 'cloud-first' approach, to the sourcing of ICT-as-a-service and to procure cloud-based ICT services as the default option for their future ICT requirements, unless a sound business case exists for a contrary solution; and
  - Analyse its application portfolio and develop roadmaps for the adoption of ICT-as-a service, including cloud computing.

In addition to the external drivers, the ICT strategic plan also notes the key internal drivers for change including business challenges that GAWB faces, which includes increasing business demands on ICT, the recruitment and retention of skilled staff, automation, and network connectivity limitations due to remote locations and technological change.

Information systems forecasting approach

GAWB's IT Strategic Plan provides the basis for the 2020-2025 forecasts as it identifies the areas and projects requiring expenditure to support the transformation. Based on the information provided we consider that GAWB has outlined a good and reasonable plan for its IT expenditure which optimises technology advances, and should improve GAWB's services and operations.

However there is a lack of detail information on how GAWB has applied the Plan to generate these forecasts including what assumptions are made and how it intends to procure these services.

IT expenditure should be clearly separated into recurrent and non-recurrent types of expenditure. Recurrent ICT is expenditure that is related to maintaining existing ICT services, functionalities, capability and/or market benefits, and occurs at least once every five years. Non-recurrent ICT is by definition not 'recurrent', and would cover one off projects needed. There are three primary reasons for non-recurrent IT expenditure:

- New systems installation to maintain existing functionalities, capabilities and services
- Complying with new regulatory requirements
- Expansion of IT capability to provide a net benefit for customers

GAWB's ICT strategy provides forecasts for both recurring and non-recurring IT expenditure. There is a one-off cost of $1.4 million which will be incurred at various points during the 5 year strategy period and then annual costs which change depending on the work program.

Unfortunately, the information provided to date is not sufficient to assess the split between recurrent and non-recurrent. The majority of IT expenditure is allocated to Software Maintenance (non-contract) which accounts for over 75% of total forecast. There are a number of specific IT programs scheduled for completion in the next period.

Assessment of base year costs

Given the substantial increase in ICT expenditure between the two regulatory periods and the lack of information to substantiate how the actual forecasts were determined, KPMG is unable to comment on the reasonableness of the base year.

Forecast drivers and assumptions

GAWB is forecasting a significant increase in its ICT expenditure which is primarily associated with moving to a cloud based approach for its ICT services. Total IT expenditure for the next regulatory control period is $15.4m which is a doubling of the expected IT expenditure in the current 2016-2020 period.

We have reviewed the IT Strategic Plan plus a number of sample business cases for IT projects conducted in this regulatory period.

Review of business case demonstrates good practice

We have reviewed 3 of the IT business cases provided by GAWB. In general, we found a reasonable approach consistent with best practice for identifying the reasons and optimal solution for these projects.

Project	Prudency	Efficiency	Comments
Microwave Network Upgrade	The business case provides justification the need for this program	Two options were considered, including a do nothing option. The cost for the project included a contingency allowance of 30%	Based on the information provided we consider this cost to be prudent and efficient.
Governance, Risk and Compliance Software Solution	The business case provides justification for this program	Three options were considered, including a status quo option. Based on the evidence provided the most cost effective option was selected	Based on the information provided we consider this cost to be prudent and efficient
Scada software upgrade	The business case provides justification for this program	The business case provides an analysis of the short-listed options. This program was approved as part of the 2015 price monitoring by the QCA. However the actual costs have been higher than expected which have been justified in the business case.	Based on the information provided we consider this cost to be prudent and efficient

Trend of increasing IT expenditure in the utilities sector

KPMG note a general trend of increases in IT expenditure observable in the utility sector:

- Almost half (49%) of Australian respondents to the KPMG/Harvey Nash CIO survey indicated that their IT budgets were increasing[82].
- Top CIO priorities as captured in KPMG's Utilities IT Benchmarking Survey[83] identified (amongst other things) a need for greater mobility in the workforce, increasing cyber security, digitisation of services and customer communication, as well as updating legacy systems.
- A primary focus of digital strategies is 'enhancing the customer experience' which requires a transformation towards putting the customer at the core of the business as well as investment in new and innovative technologies, all in an industry that has historically concentrated more on efficiency of the back-office.
- Cyber security has never been higher on the boardroom agenda with the KPMG/Harvey Nash CIO survey showing an increase in its priority with boards over the previous year of 23%.

A 2018 Gartner presentation[84] on future technology trends impacting mid-sized enterprises calls out three trends they expect such a business to leverage which also align with GAWB's ICT strategies, specifically:

[82] www.hnkpmgciosurvey.com

[83] A core source data for our benchmarking comparison are the results of the 2018 KPMG Utilities IT Benchmarking Survey. This survey utilises confidentially sourced information together with publically available data from the Australian Energy Regulator to benchmark the IT expenditure and strategies of Australian electricity and gas distributors. These organisations, whist not operating in the water industry, do have very common characteristics to GAWB and therefore provide a reasonable comparison. For example, they all invest in, operate and maintain networks of critical assets necessary for the provision of essential services to customers.

[84] Top Technology Trends Impacting Midsize Enterprises – Gartner IT Infrastructure, Operations & Cloud Strategies conference, December 2018

- Risk Based Security – "A practical approach to protecting assets that matter while avoiding over spending on assets that don't". This aligns to GAWB's approach to Cyber security that focuses on the risk to the business and using that risk assessment to drive the optimal level of investment.
- Data Curation – Insight and decision making from Business Intelligence and Analytics based on reliable data. GAWB notes that Analytics and business intelligence will support informed decision making within GAWB.
- Operational Innovation – the optimisation of enterprise operations, a very traditional goal for IT in the utilities sector, and digital transformation. The ICT Strategic Plan 2019-2024 provides a framework for GAWB to embark on the digital transformation. Digital, for GAWB, is defined as integration of technology into all areas of GAWB business fundamentally changing the way it operates and delivers value to its customers.

Within this context, the GAWB IT strategic plan is broadly consistent with the general trends in the sector.

Benchmarking analysis

KPMG conducted some simple benchmarking of GAWB IT costs as a proportion of revenue in comparison with a number of Victorian Water businesses. GAWB's forecasts results in an IT per revenue of 4% to 5% which is in the band for other water businesses, although towards the top end of the range.

Summary findings

KPMG found it difficult to assess the forecast expenditure as we don't have business cases or information on how the actual forecasts were determined. We note GAWB's comments that future 'software as a service' activities will be done in accordance with GAWB's procurement framework. However based on the information provided we have not been able to assess the forecasts.

Given the latest trends in IT expenditure (see below) we accept the increase in IT costs but the efficiency of these costs cannot be justified given the information provided by GAWB. While overall, there is a sense that there good governance and over-sight of IT expenditure within GAWB, we have not been able to consider and advise on whether:

- the proposed timing of the expenditure is optimal
- the cost forecast has been developed consistent with efficiency principles and reasonable assumptions.
- the projects will deliver net benefits for customers and there is a clear need for the expenditure
- GAWB has a robust system for monitoring, evaluating and reporting on achievement of the intended outcomes for IT expenditure throughout the regulatory period,

We would expect that a number of IT projects would deliver cost savings in other areas. In addition, the implementation and upgrading of the ERP systems in this current period should lead to productivity benefits. Overall GAWB needs to conduct more benefits assessments of IT projects both during the project development phase and after implementation.

At this stage, we are minded not to recommend any reductions to GAWB's proposed IT expenditure. Increases in IT expenditure will be required and we have not been able to identify an alternative forecast which can be credibly justified. Instead we recommend that there is increased reporting and assessment of IT projects over the next period in order to provide a better sample of materials to review the expenditure at the end of the period.

Going forward, there is also merit in GAWB preparing Post Implementation Reports (PIR) for large IT projects. This will help improve transparency and understanding of the impacts of IT expenditure for customers. A best-practice PIR would include all of the following:

- a comparison of the actual cost to the proposed cost in the business case

- a comparison of the actual timeframe to complete the project with the forecast timeframe
- a comparison of the actual achieved benefit to the forecast benefit (as best estimated) in the business case
- an explanation of any material variations in costs, delivery timeframe, and benefits realised

A PIR need not be an expensive exercise for GAWB as it could be conducted internally by the ITOC set up by GAWB for its ICT implementation.

We accept GAWB's forecast for information systems and have only adjusted the proposed forecast for the updated CPI forecasts.

Table 83: GAWB proposed information systems opex and KPMG recommendations ($million)

$m	2021	2022	2023	2024	2025
GAWB proposal	3,288,676	2,862,491	2,997,086	3,180,862	3,089,544
KPMG recommendation	3,242,546	2,813,787	2,946,380	3,123,684	3,030,746
Difference	**46,130**	**183,299**	**50,706**	**57,178**	**58,798**

7.5.9 Professional services

Professional services expenditure forecasts and historical trends

Professional services represents a significant share of GAWB's operating costs. We note that the cost data submitted to us by GAWB differs from the costs included in GAWB's submission to the QCA. Firstly, the data on professional services costs include the QCA levy, which are excluded from the figures presented in the submission – we consider they should indeed be excluded from professional services, as it is probably more appropriately recorded as an administration cost.

Removing the QCA levy from the professional services result in the cost data and the numbers in the submission aligning more closely. GAWB has submitted that the remaining differences (other than rounding) relate to costs associated with the QCA process, including consulting services related to the preparation of the pricing submission and implementation of the QCA decisions. These differences are shown in Table 86.

Our analysis is based on GAWB's submitted data on professional services costs, excluding the QCA levy but including other QCA related services. However, in our recommended figures for professional services we include the QCA levy, for completeness.

Table 84: GAWB professional services costs in regulatory submission vs in data received by KPMG ($2018-19)

	2019 (base year)	2021	2022	2023	2024	2025
GAWB regulatory submission	2,070,000	3,860,000	2,380,000	2,200,000	2,130,000	2,170,000
Cost data received by KPMG, excluding the QCA levy	2,455,053	3,964,375	2,377,182	2,195,746	2,657,722	2,665,722
Difference – QCA related services	385,053	104,375	-2,818	-4,254	527,722	495,722

Over the current and forecast period, professional services expenditure ranges from 7% to 12% of total annual opex. GAWB submitted that it is not efficient to retain permanent internal capability to meet all needs in many areas, and with the head office in Gladstone, it is often difficult to attract and retain some of the specialist skills that are required.

GAWB therefore argues that, apart from being at times necessary, it is often more efficient to use external resources to either provide specialist capability that GAWB does not have and/or supplement its own internal resources to address peaks in the work program.

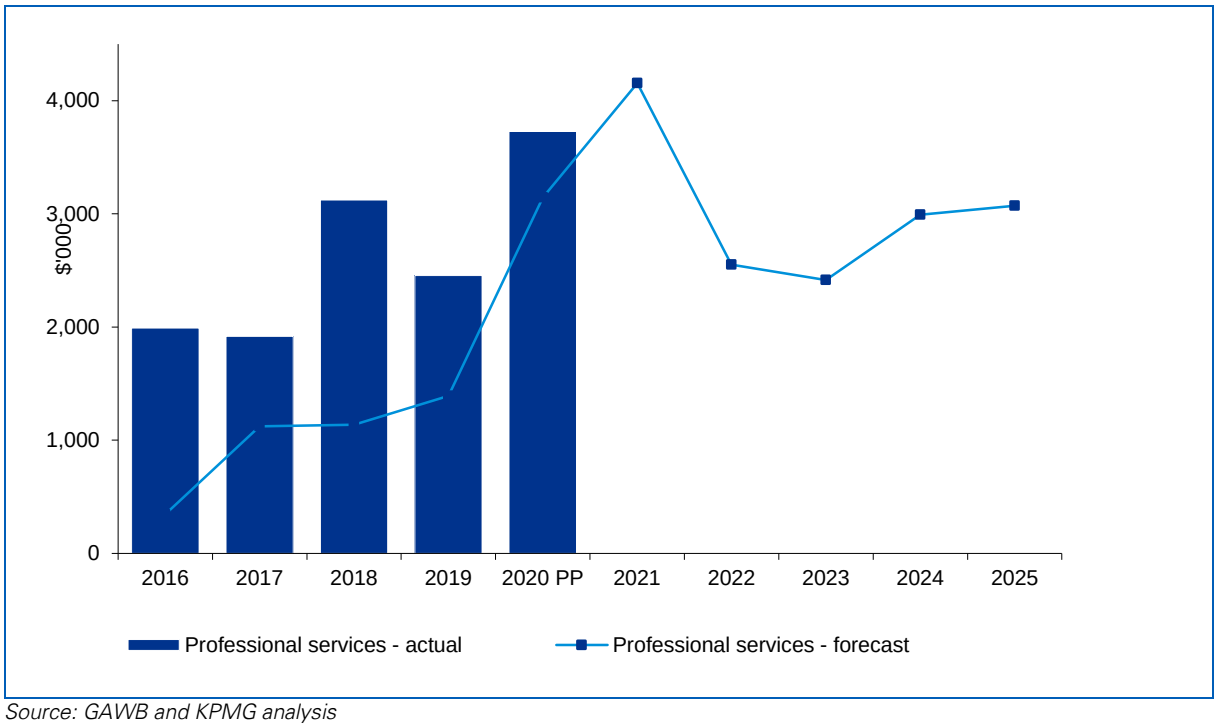
In the current period, GAWBs actual spend on professional services significantly exceeded the forecast from 2015 in all years, with exceedance ranging from $794k in 2016-17 to 2.0m in 2017-18. GAWB submitted that these overruns were due a number of areas where the need for external resources were either not anticipated, or were unable to be estimated with any certainly, by GAWB at the time of the last price review. For example, GAWB sought external assistance to:

- address concerns around GAWB's procurement practices identified in the last price review
- review GAWB's governance practices to ensure the quality and quantity of information collated and reported supports the maintenance of strong governance processes and cultures across the organisation
- ensure GAWB's operational practices align with new or expanded environmental and sustainability obligations
- review GAWB's environmental policies and catchment management practices to ensure they align with current obligations and best practice.
- oversee the development and implementation of an ICT cloud strategy and an enhanced governance framework.

Over the current period, GAWB's professional services is expected to grow by $1.7m or 87%, from $2.0m in 2015-16 to $3.7m by 2019-20, equal to a CAGR of 17.0%. This was dominated by growth in the 'consulting services' category, which grew from $552k in 2015-16 to $2.5m in 2019-20, at a CAGR of 45.6%. Internal and external audit fees also saw strong growth in the current period, with CAGRs of 13.1% and 10.9% respectively, up from a combined $160k in 2015-16 to $514k in 2019-20.

In the forward period, GAWB is forecasting a further significant increase, peaking in 2020-21, up 1a further 1.5% or $428k to $4.2m relative to budgeted spend in 2019-20. Professional services expenditure is then forecast to decline for the remaining years to around the same levels as in 2017-18 and 2018-19.

Figure 28: Professional services forecasts and actuals

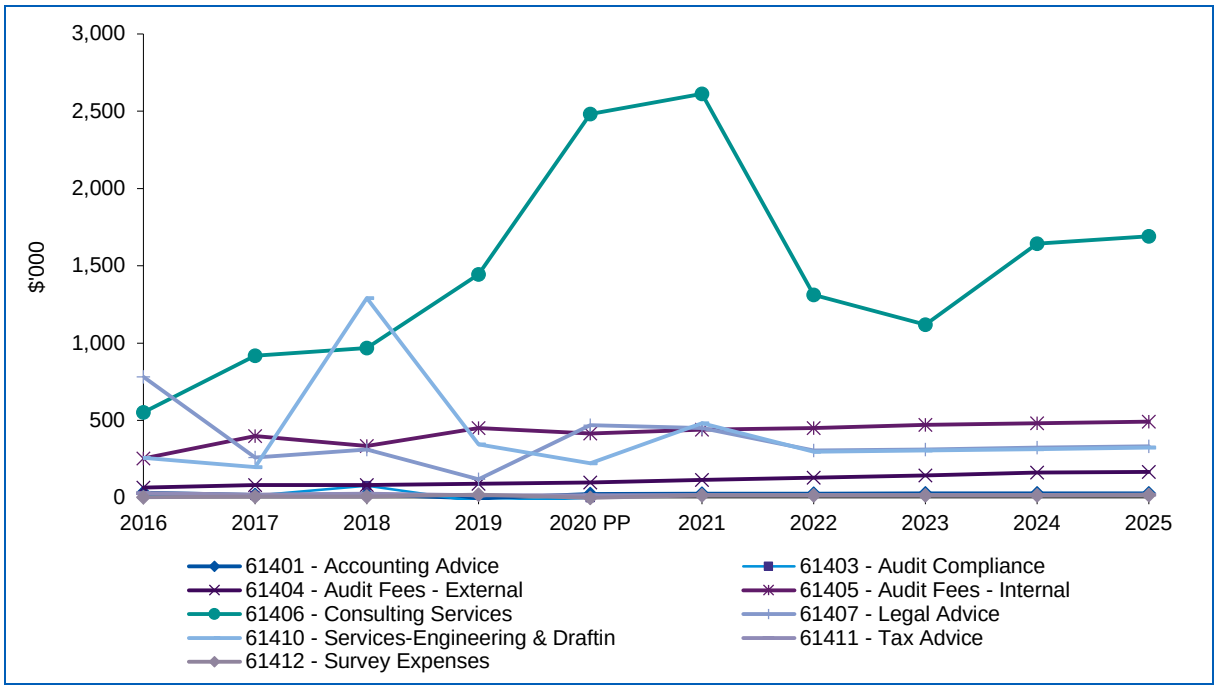


Source: GAWB and KPMG analysis

Professional services forecasting approach

The forecast professional services spend reflect a bottom up estimate based on a range of projects and ongoing services GAWB expects in the coming period. GAWB has stated that all professional services except *Corporate Services – Engineering and Drafting* [GL61401] are escalated by the escalation rate identified by DAE (3.04% CAGR).

Figure 29: Architectural, engineering and technical services PPI and Queensland WPI growth



Source: GAWB 2019 (DAE)

Assessment of baseline costs

While expenditure on professional services in the current period has exceeded the 2016 forecast, we consider the initiatives that GAWB has submitted is the reasons for the overspend are likely prudent, as they address legislative requirements or are initiatives that should deliver efficiency savings in the near and long-term. GAWB's current procurement processes are sound, and should therefore deliver efficient outcomes if properly adhered to. On this assumption, we consider expenditure incurred in 2018-19 is likely reasonably efficient, although we have not been provided evidence of GWABs adherence to its procurement process in relation to the particular initiatives highlighted by GAWB.

Regardless, we note that spend on professional services can be lumpy, as demonstrated by GAWB's actual and forecast expenditure profile. We therefore do not consider adopting actual expenditure in 2018-19 is the best approach. We discuss our recommended approach below.

Forecast drivers and assumptions

As noted above, GAWB's forecasts is based on a bottom up estimate of its need for professional services in the coming period. We make the following observations:

- The information supplied provide minimal justification for the proposed expenditure, including why a large number of consulting expenditure items are assumed to be ongoing.
- GAWB seems to be committing to too many strategic initiatives in 2020-21. GAWB has proposed a very significant peak in the number of initiatives and expenditure in 2020-21 – 35 activities compared with 26 or 27 in the remaining years, and expenditure of nearly $4.0m compared with less than $2.5m in the remaining years. We consider GAWB will be better able to manage the initiatives if they are not carried out all at once, which will ultimately produce better outcomes.

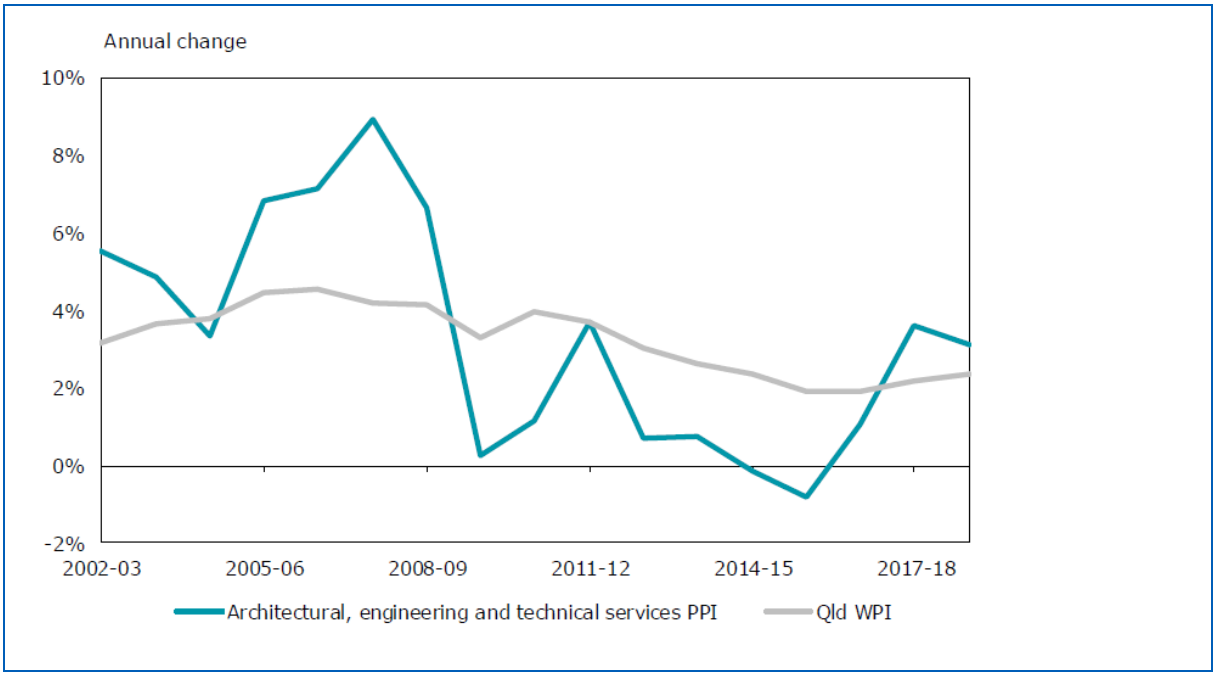
- We question the timing of the $340k forecast in 2020-21 to review LCMP asset maintenance cost estimates – it would seem more appropriate to do this work prior to a regulatory proposal, rather than after the decision is made.
- It is not clear why some of these costs are recorded in professional services opex, when they are probably more appropriately classified in other cost categories – for example, engineering and drafting services (totalling $1.9m over the period in $2018-19), or LCMP – parent/child structure (which should be in IT).
- GAWB's proposal includes expenditure of $622k ($2018-19) in 2020-21, associated with the Lake Awoonga Recreational Strategy (maintenance of new assets). In its submission, GAWB explained it carried out extensive customer and community engagement for this strategy, although we have not been provided information to demonstrate customers support the expenditure.
- We also note that GAWB has forecast a total of $900k ($2018-19) for external advice for the improvement the LCMP framework and practices. We agree there is a need to review and improve GAWB's asset maintenance practices and point to our earlier recommendations in this regard. We stress the need to ensure that these investments deliver value for money to customers.
- Finally, we note the $125k ($2018-19) in 2020-21 for implementation of the regulatory decisions and improved reporting frameworks – we strongly support this expenditure, and point to our recommendations on the need for better data preparation and reporting to support the regulatory framework, including the establishment of a reporting template.

Assessment of the application of escalators

GAWB engages labour based engineering services on an ongoing basis. In developing escalation factors DAE utilised the PPI for architectural, engineering and technical services as proxy for cost escalation factors for professional services (engineering). Figure 30 shows how the PPI has changed relative to WPI growth. DAE has assumed that the decline and subsequent low growth in the PPI post the 2008 Financial Crisis reflects conditions for engineering services in Queensland within the context of a slowdown in mining investment and a normalisation of commodity prices. DAE assumes that after contracting in 2014-15 and 2015-16, a bottoming out in mining investment activity in the Australian economy and a return to healthier commodity prices have seen the PPI return to positive growth. DAE considers growth in wages (WPI) has been a reasonable longer-term proxy for increases in the PPI. From 2001-02 to 2018-19, the PPI for architectural, engineering and technical services increased by a CAGR of 3.3%, compared to 3.2% for Queensland WPI.

We consider the assumptions and approach adopted by DAE are logical and appropriate, and we have adopted the same approach in updating the escalators for professional services.

Figure 30: Architectural, engineering and technical services PPI and Queensland WPI growth



Source: GAWB 2019 (DAE)

Summary findings

Our draft recommendation on forecast professional services expenditure is to use the average spend in the current period as the baseline for the forward period, including budgeted spend in 2019-20. This equates to average annual spend of $2.5m pa ($2018-19) compared with average proposed spend of $2.8m ($2018-19), while remaining above the originally forecast spend in the current period, and above actual spend in 3 out of 5 years in the current period.

Further, we recommend that the professional services costs are included in the opex pool to which the efficiency factor is applied, reflective of the expectation that many of the initiatives in the current period and proposed will deliver efficiency dividends.

We consider our recommended professional services expenditure is reasonable based on:

a) historical expenditure, taking into account GAWB's explanation that a key driver of the overspend in the current period related to one-off initiatives that should deliver efficiency savings, and

b) GAWB has provided minimal justification for the majority of the forecast professional services spend.

We also consider there is sufficient budget and flexibility within our recommended expenditure envelope for GAWB to reprioritise expenditure as needed, including for the implementation of our recommendations. We have not sought to identify the appropriate profile of expenditure, but note that GAWB has the ability to move expenditure between years as it deems necessary. We are also of the view that the initiatives will be more effectively delivered and produce better outcomes if GAWB does not seek to do them all at once (eg, in 2020-21).

Finally, for completeness, we have adopted GAWB's forecast of the QCA levy and related expenditure, adjusted only for our recommended update to the CPI.

Table 85: GAWB proposed professional services opex and KPMG recommendation ($nominal)

	2021	2022	2023	2024	2025
GAWB proposal	4,156,714	2,552,886	2,415,614	2,992,408	3,072,455
KPMG recommendation	2,749,869	2,612,226	2,675,332	2,736,413	2,798,907
Difference	(1,406,845)	59,340	259,717	(255,995)	(273,548)

Table 86: GAWB proposed QCA levy expenditure and KPMG recommendation ($nominal)

	2021	2022	2023	2024	2025
GAWB proposal	347,448	-	-	336,124	1,719,274
KPMG recommendation	342,574	-	-	330,082	1,686,554
Difference	(4,874)	-	-	(6,042)	(32,720)

7.5.10 Administration

Administration expenditure forecasts and historical trends

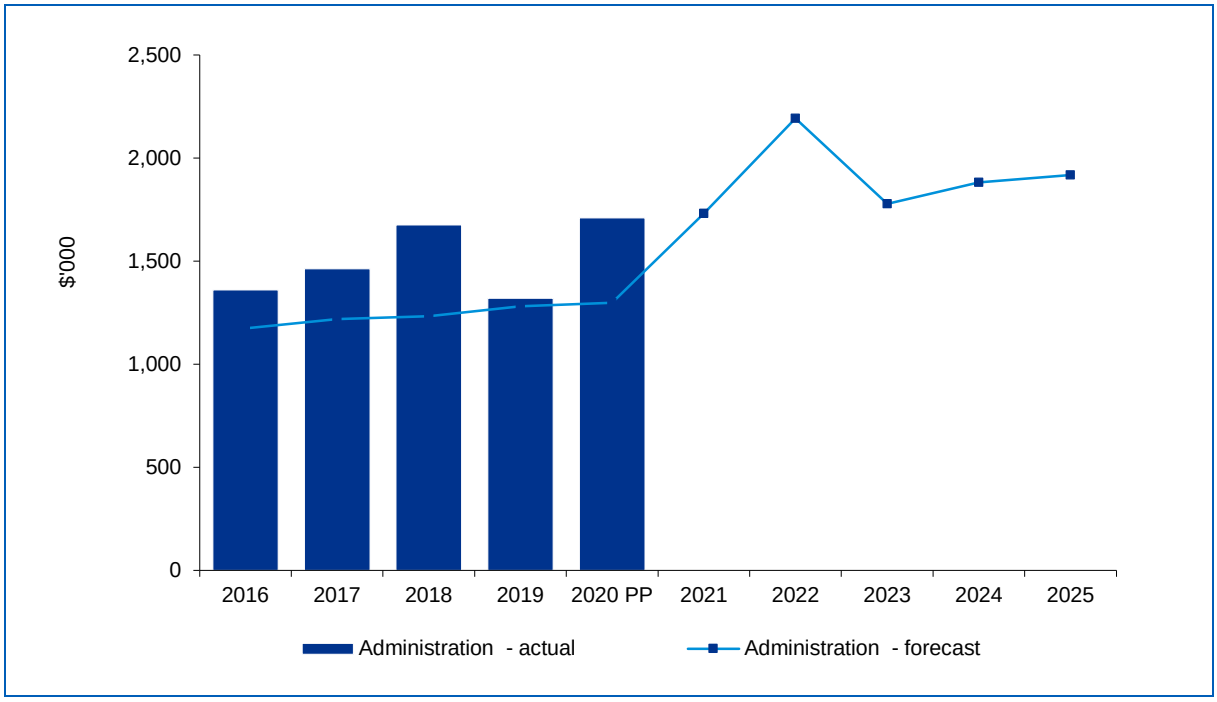
GAWB's annual administration costs in the current period exceeded the forecasts from 2015, and increased from $1.4m in 2015-16 to $1.7m in 2019-20 (budgeted). Administration costs has grown at a CAGR of 11.4% over the period, though we note spend in 2018-19 was below trend. Key drivers of growth in the current period includes:

- Accommodation and travel, growing at a CAGR of 9.4% from $188k in $2015-16 to $269k in 2019-20 (however, GAWB has submitted that this growth was due to an error in the estimation methodology used for the 2015 price review)
- Subscriptions and publications, growing at a CAGR of 28% from $102k in $2015-16 to $275k in 2019-20
- Telecommunications, growing at a CAGR of 15.8% from $133k in $2015-16 to $240k in 2019-20
- Security services, growing at a CAGR of 29.5% from $40k in $2015-16 to $112k in 2019-20.

There was a significant reduction in pooled (small) asset purchases (<$1000), down from $156k in 2015-16 to $18k in 2019-20. GAWB has forecast this cost to remain low in the forward period. It is unclear what drives the cost reduction, and if it may be due to these types of small purchases instead being recorded against other cost categories.

In the forward period, GAWB has forecast administration costs to continue to increase, with a temporary peak in 2021-22 at $2.2m. The peak is driven by a one-off expense related to records management. Disregarding this one-off expenditure, administration costs are forecast to grow at a CAGR of 2.6% between 2021-25.

Figure 31: Administration forecasts and actuals



Source: GAWB and KPMG analysis

Administration forecasting approach

GAWB has not specified the forecasting method used for administration costs, but it appears it has used a combination of bottom up and roll-forward of base-year expenditure, along with the application of DAE's proposed escalation factors.

Assessment of baseline costs

We consider GAWB's total administration costs in 2018-19 is reasonable based on it being the lowest spend in the current period, and it aligns with the 2016 forecast. However, since GAWB has used a hybrid forecasting approach, we have instead carried out an assessment of each line item in GAWB's GL – see below.

Forecast drivers and assumptions

GAWB has provided limited information on the assumptions and drivers underpinning its forecast administration expenditure. Analysing GL level data supplied by GAWB, we make the following observations:

- The forecast for accommodation and travel in 2020-21 appears reasonable given historic spend, but it is forecast to increase further toward the end of the period, from $213k in 2020-21 to $260k in 2024-25. GAWB has submitted that a portion of the increase in the latter years is due to activities associated with the QCA process. However, we note these activities have also been taking place in the current period, and does therefore not explain why forecast accommodation and travel costs are generally higher than in the current period.
- Expenditure associated with cleaning and waste removal has seen a significant reduction in the 2019-20 budget, down from $204k in 2018-19 to $122k in 2019-20. GAWB forecast this to remain constant in real terms, and states that the lower cost is due to a new cleaning contract and efficiencies from moving all staff to a single location.
- As noted above, GAWB has forecast a significant expense of $428k in 2021-22 in relation to records management. GAWB has submitted that the amount is based on independent advice and therefore deemed to be efficient. However, we have not been provided any information to demonstrate the

need for the project, that the scope and timing is appropriate, and that the expected benefits outweigh the costs.

- The significant increase in costs for security services in the current period is forecast to remain high. GAWB has submitted that the growth in security costs is due to a number of instances occurring at key sites such as the Gladstone Water Treatment Plant and the need to broaden the number of sites covered by our existing security service to include inspections at new locations.
- Costs associated with subscriptions and publications saw a considerable increase over the current period, and is forecast to continue to increase. GAWB explains that this cost category includes membership fees for Water Services Association of Australia (WSAA), Australian Water Association (AWA) and the Queensland Water Directorate.

More generally, a large share of cost items see increases over the forward period, with minimal explanations having been provided, and in some cases it is not clear from the description that the cost items are prudent and would deliver value for customers.

Assessment of the application of escalators

GAWB has used DAE's proposed inflation escalation factor to arrive at nominal forecast for most administration cost items, except pooled and minor asset purchases, for which it has applied DAE's recommended escalation factor for 'other materials and services'. We disagree with the use of the higher escalation factor for 'other materials and services' for pooled and minor assets – instead we consider it should be the same escalation factor recommended by DAE for materials, which was based on forecast CPI. We have therefore adopted an escalation factor based on forecast CPI for all administration cost items.

Summary findings

We carried out a line-by-line assessment of GAWB's GL cost items for its administration function, and have made recommendations for each on the basis of historical expenditure and any other information provided by GAWB. Our recommended approach by item is listed in Table 89.

Table 87: KPMG recommendation by Administration cost items

Cost items		KPMG recommendation	Reason
• Accommodation & Travel		Maintain at proposed 2020-21 level in $2018-19.	As noted above, proposed expenditure in 2020-21 is in line with historical expenditure, while GAWB has not justified the proposed increase.
• Advertising • Community Relations • Meeting expenses	• Printing • Search fees • Sponsorships & Donations	Adopt average spend over current period in $2018-19.	No information provided to support increase, and no apparent reason why these costs items should increase.
• Cleaning & Waste Removal • Postage & Freight • Stationery • Telecommunications • Entertainment deductible • Entertainment non-deductible	• Pooled Asset Purchases ($101-$1000) • Minor Assets ($1000 to $5000) • Turtle Triage	Adopt GAWB's proposed forecast in $2018-19.	GAWB's proposed forecast is in line with or below historical (average) expenditure.

• Licences, Fees, Permits & Land		Adopt GAWB's proposed forecast in $2018-19.	Non-controllable costs.
• Other Expenses		Adopt GAWB's proposed forecast in $2018-19.	GAWB has submitted that these costs relate to the CEO office, and that the discrepancy with historical costs is due to changes in how costs have been allocated. We consider the proposed are reasonable costs associated with the CEO office, but note that we have no visibility on the changes in cost allocation. In particular, GAWB refers to an increase in Board and Company secretary costs, but we have not been provided detailed information in this regard. We have therefore not been able to investigate any changes to the total costs that have been reallocated.
• Security Services • Subscriptions & Publications	• Lease Payments-Buildings/Land	Adopt GAWB's proposed forecast in $2018-19.	GAWB's justification for higher than historical spend is reasonable.
• Records Management		No allowance	Significant expenditure, and insufficient evidence provided in support of expenditure.

On this basis, we arrived at an annual allowance for administration costs of approximately $1.5m ($2018-19). While this is higher than GAWB's actual spend in 2018-19 ($1.3m) and higher than GAWB's forecast for all years in the current period ($1.2m-1.3m), it is in line with average (expected) spend during the current period. It is a reduction relative to GAWB's budgeted spend in 2020-21 ($1.7m) and proposed average annual spend of $1.7m ($2018-19) in the coming period.

Table 88: GAWB proposed administration opex and KPMG recommendation ($nominal)

	2021	2022	2023	2024	2025
GAWB proposal	1,730,688	2,191,774	1,777,372	1,881,645	1,917,460
KPMG recommendation	1,579,812	1,561,161	1,602,010	1,669,905	1,668,922
Difference	(150,876)	(630,613)	(175,362)	(211,739)	(248,538)

8 Other areas of improvement

8.1 Customer engagement

The role that customers play in the development of water business strategies and standards of services is quickly becoming unequivocal. Water businesses and regulators across other jurisdictions are actively seeking to improve their engagement with customers. This trend is most evident in Victoria with the implementation of the PREMO framework, in South Australia with SA Water adopting customer centric planning and in NSW with Sydney Water continuing on its journey to becoming a customer centric organisation.

GAWB's submission to the QCA notes that, dialogue is central to developing a genuine focus on customers. This ensures the water services that GAWB provides delivers value to current and future customers.

We agree that optimising the trade-offs between cost and service standards is critical to achieving the best outcome for customer. Customers' involvement in developing and setting prices and services can contribute to better outcomes. Businesses can better understand their customers concerns and preferences and are more likely to provide services that customers are willing to pay for. At the same time, customers can better understand the factors driving prices.

We note that in some instances GAWB may not have engaged customers to the same level that would be considered best practice.

For the following reviews to be in line with best practice we suggest that GAWB ensure that customers are engaged on an ongoing basis to ensure that the submission put forward to the QCA is well understood by customers.

The ESC has provided guidance to help the Victorian businesses describe the extent of their customer engagement programs across form, timing and content. It is a medium that could be used by businesses for describing the different types of customer engagement, without prescribing how that engagement is to be conducted[85].

We recommend that GAWB:

- ensure that customers are engaged on an ongoing basis to provide more focus on what is important to customers over the course of the regulatory period and to provide a better understanding of customer requirements prior to the review
- ensure that its consultation draws a clearer link between proposed expenditure and both prices and service level outcomes for customers

8.2 Base-Step-Trend review and data templates

A major challenge in this review was obtaining the data required to carry out a robust review of costs to establish prudent and efficient costs. There were likely several reasons for this challenge:

- Differing views on the appropriate scope of the review
- Differing expectations between GAWB and the QCA on the approach to the review
- Differing views on the information necessary to carry out the required assessments.

[85] https://www.esc.vic.gov.au/sites/default/files/documents/goulburn-murray-water-price-review-2020-guidance-paper-%28WCIR%29-20181002.pdf, see page 10

- Information not being readily available and/or in a format that would facilitate effective and efficient review.

To help mitigate these challenges in the future, we strongly recommend that, prior to the next price review, the QCA and GAWB develop and implement a base-step-trend (BST) method for reviewing operating expenditure. BST approaches are the most common regulatory approach to reviews of operating expenditure. A BST approach tends to provide a more structured, and simplified basis for GAWB to both develop its forecasts and for the QCA to undertake its regulatory assessment of those forecasts. This approach establishes an efficient base year, rolls forward the efficient base operating expenditure to take account of scale growth, input price growth and efficiency improvements and includes adjustments for step changes to costs. Step changes could, for example, flow from new regulatory obligations.

BST allows the regulator to differentiate between costs imposed on the business (for example resulting from new legislation or government policy), those driven by efficient capex-opex trade-offs, costs driven by customers and those driven by internal management decisions.

BST allows for easy identification of doubling counting of costs. For example, a step change should not double-count the costs of increased volume or scale compensated through the forecast change in output. BST accounts for output growth by applying a forecast output growth factor to the opex base year. If the output growth measure captures all changes in output then step changes that relate to forecast changes in output are not required.

BST approach is considered regulatory best practice as it is more efficient and less burdensome for both the regulator and the regulated business, while often delivering more effective overall assessments than bottom up analysis of a small sample of expenditure. A BST method is also consistent with the Queensland Governments requirements of materiality that have been applied to the regulatory framework.

To support an efficient and effective review process, we also recommend GAWB develop (in consultation with the QCA) a detailed information template that it canuse to submit the financial data accompanying its pricing proposal.

Information templates represent regulatory best practice and are an integral part of the price review process undertaken by IPART in NSW and the ESC in Victoria. The use of information template provides guidance to GAWB by explicitly setting out the data required by the QCA to undertake its review. Information templates will minimize the extent to which the QCA has to issue formal request for information following the submission of the pricing proposal, and subsequently reduce the regulatory burden placed on GAWB. The information templates developed by IPART and the ESC incorporate a fully functioning building block model that captures all opex, capex, tariff and demand data requirements necessary for the QCA to make an informed regulatory decision.

Appendix A Efficiency factor

Introduction

Efficiency levels along with changes in efficiency over time is a major consideration of most if not all price reviews. Understanding the potential for future cost savings through efficiency improvements is important in setting allowances for both capital and operating expenditure. GAWB has proposed an ongoing efficiency of 1% to its controllable operating and maintenance expenditure. The proposed efficiency factor is static and is applied annually to controllable opex.

The concept of efficiency has a number of dimensions. Overall economic efficiency requires satisfaction of technical (productive), allocative and dynamic efficiency:

- Technical (sometimes referred to as productive) efficiency requires that goods and services be produced at the lowest possible cost. In the context of GAWB, this type of efficiency means that water supply services are delivered at lowest possible input cost.
- Dynamic efficiency means that, over time, consumers are offered new or better products and services, or existing products and services at lower costs. In a practical sense, this type of efficiency refers to the extent to which GAWB is willing and able to adopt new technologies or innovations that either improve services or lead to greater technical efficiencies.
- Allocative efficiency requires that production of the set of goods and services that consumers value most from a given set of resources. In the context of GAWB, this type of efficiency refers to the ability to manage resources such that the outputs it delivers best meet those desired by the wider community.

Within an economic regulatory context, efficiency inevitably breaks down to technical efficiency. The fundamental underlying question is whether the revenue requirement, as derived through the building block model, is consistent with an efficient level of expenditure (or least cost).

When regulators' consider the application of efficiency factors, there are three key inter-related aspects to decide upon:

- The nature of the efficiency factor i.e. how it is applied?
- What level to set the efficiency factor?
- What categories of costs to apply the factor to?

Within the context of deterministic price reviews, regulators (such as IPART and the AER) often refer to two types of efficiency: Catch-up efficiency and continuous or ongoing efficiency. Catch-up efficiency refers to the efficiency improvement needed for the business to catch-up to the production frontier, and is often applied to the first year of the regulatory period. Continuous efficiency refers to the expectation that the frontier itself will be continually moving as a result of ongoing innovations and cost savings due to technological change. Continuous efficiency is typically applied on a per annum basis, meaning it is compounding in nature. These approaches to efficiency targets rely on complex quantitative assessments of efficiency typically using a benchmarking approach. Some regulatory frameworks (such as the Victorian framework) do not make the distinction between catch up and continuous efficiency and adopt a single efficiency target that is consistent with the concept of an ongoing continuous efficiency gain.

Given the materiality constraints placed on the QCA's review of GAWB's proposal, the light handed nature of the current price monitoring regulatory framework and the level of granularity of the expenditure data made available to the QCA, it is not possible or appropriate to conduct such detailed quantitative assessment. However it is still prudent for the QCA to consider the potential trend in future efficiencies (through example, operational learnings and system improvements) over this period.

Application of efficiency factor

GAWB's proposed efficiency factor is not compounding in nature. GAWB applies the target separately to its forecasts on a per annum basis, consequently the target and its associated efficiency is only netted off the base expenditure for the year in which it is applied meaning that the efficiency saving for any one year reflects the target for that year and does not include the impact of the preceding years target.

This proposed application approach is not common. In other jurisdictions (such as Victoria) compounding efficiency targets is established practice. This means that the efficiency saving in any one year will reflect both the savings for that year and the ongoing savings resulting from efficiencies achieved in previous years. Compounding efficiency rates are analogous to the manner in which financial institutions apply compounding interest earnings to savings. Compounding rates allow for non-linear positive escalations of cost (for costs to increase at an increasing rate over time) and for non-linear negative escalations of costs (for costs to decrease at a decreasing rate over time). Effectively efficiency improvements achieved in any year are lock in for the future.

Compounding rates for efficiency gains are more consistent with the concept of ongoing or continuing efficiency than the static approach adopted by GAWB. A static approach implies that efficiency gains are either short term gains that are replicated annually or represent gains that are only achieved in year one and then no further efficiency gains are achieved over the pricing period.

Compounding efficiency rates allow for improvements in efficiency over a pricing period and reflect the continuous nature of efficiency gains by allowing for efficiencies obtained in any given year to be applied over a number of subsequent years. For example, in a given year an efficiency gain of 1 percent is rolled into the opex base. This efficient opex base (inclusive of the efficiency gain) is carried forward into the subsequent year where another efficiency gain is achieved (thus the compounding nature of the efficiency). Efficiency related to investment in business processes, learnings on operational and maintenance practices, or investments in technological change are typically expected to lead to multiyear improvements in efficiency. Compounding rates reflect the nature of continuous efficiency gains in that they roll one year's gains into the ongoing opex base while allowing for the impact of additional efficiencies in the subsequent years.

KPMG recommends that an efficiency factor be applied to GAWB's expenditure in a compounding manner, consistent with the nature of continuous or ongoing efficiency. This would apply a stronger incentive on the businesses to continue to improve.

Level of efficiency

We note that most regulators impose an efficiency target on categories of operating expenditure considered to be controllable. This reflects the variable and trend nature of operating expenditure. Regarding capital expenditure, consideration of efficiency improvements in delivery is implicitly considered when evaluating separate projects.

These efficiency factors typically range from 1% to 3% per annum depending on whether the factor is solely based on the potential for continuous efficiency or if the factor also includes an adjustment for catch-up efficiency potential. For example the ESC in Water Price Review 2013 imposed a minimum compounding efficiency target of 1% per annum on each of the Victorian water businesses in reflection of continuous efficiency. We also note that under the ESC's new Performance, Risk, Engagement, Management, Outcomes (PREMO) regulatory framework, businesses are incentivised to propose greater efficiency targets (above the minimum 1% hurdle set by the regulator).

The first PREMO review occurred in 2017, and the average opex efficiency factor proposed by the 14 participating urban water businesses was approximately 1.8% p.a. compounding.[86]

[86] This average excludes Western Water and South Gippsland Water, as these businesses were excluded from the 2017 price review.

In 2015 IPART imposed on Sydney Water both continuing and catch-up efficiencies that maxed at 3% per annum in 2020. Other recent reviews include that undertaken by ESCOSA of SA Water. The independent reviewer of SA Water's opex recommended:

"Acceptance of SA Water's proposed efficiency target of 1 % per annum (compounding) for the first two years of the RBP2016 regulatory period but applying an additional efficiency target equal to 50% of the general efficiencies identified by SA Water for the last two years of the regulatory period to reflect the level of ongoing efficiencies we consider that SA Water will be able to achieve."

KPMG notes that in 2017, the QCA approved a (non-compounding) efficiency factor of 0.2% for Seqwater. The Seqwater efficiency factor is cumulative, meaning that each year the efficiency factor increases by 0.2 percentage points. GAWB's proposed static 1% factor is greater than the approved annual increment for Seqwater, however, it is lower than the aggregated accumulative rate towards the end of Seqwater's pricing period. The GAWB proposal is also towards the lower end of recent outcomes in other jurisdictions (see table 6.8) and as it is static, is lower than the default minimum rate accepted by the ESC in Victoria (1% compounding).

Table 89: 2018 Proposed PREMO continuous efficiency factors

Water Business	% per annum, compounded
Barwon	2.3
Central Highlands Water	1.6
CWW	2.0
Coliban Water	1.5
East Gippsland Water	1.2
Gippsland Water	1.2
Goulburn Valley Water	3.1
GWMWater	1.5
Lower Murray Water (Urban)	1.0
North East Water	1.2
South East Water	2.3
Wannon Water	1.0
Westernport Water	2.7
Yarra Valley Water	2.5
Average	**1.8%**

Source: https://www.esc.vic.gov.au/water/water-prices-tariffs-and-special-drainage/water-price-reviews/water-price-review-2018#toc--east-gippsland-water *The efficiency factors included in the table are those outlined in the financial models available for each of the regulated businesses.*

The following table sets other recent regulatory precedents. For water utilities, recent ongoing efficiency rates range from 0.75% (excluding catch up efficiency) through to 2.5% pa. Making direct comparisons across jurisdictions is difficult due to differences in each jurisdiction's regulatory framework and the particular circumstance and operating environment of the business. This is coupled with a general lack of transparency in approaches to efficiency targets, as noted by the AER (2019) in *Forecasting productivity growth for electricity*.

For example, the efficiency target approved for Melbourne Water appears materially higher, however the Victorian regulatory framework adopts a base-step-trend approach to opex forecasting, which is materially different from the current GAWB approach. As with GAWB, the efficiency factor is applied

to controllable opex, however the framework includes a growth related escalator to recognise cost increases due to increases in demand that in practice acts to offset the impact of efficiency targets on overall prices. The Victorian growth escalator performs a similar function to the opex escalators applied under GAWB's current bottom-up approach to forecasting costs.

Another complicating factor is that some regulators (such as IPART) adopt catch-up efficiency targets, whereas other regulators (such as the AER) prefer to address catch-up efficiency by making one-off adjustments directly to the opex base-year used to generate forecasts.

Table 90: Productivity targets in regulatory determinations, average annual %

Water Business	State	% per annum	Application
Melbourne Water (2016- 21)[a]	Vic	2%	Applied to base line controllable opex forecasted using a base-step-trend approach. The Efficiency target is applied as a per annum compounding rate.
SAWater (2016-20)[b]	SA	1% per annum escalating to 1.75% for the final two years of the regulatory period.	Applied to total opex for water and sewerage
Sydney Water (2016-20)[d]	NSW	0.75%	Applied to total opex. The per annum target incorporates an ongoing efficiency target of 0.25% the remainder of the target is attributable to catch up efficiency.
Seqwater (2018-28)[f]	QLD	0.2% increasing annually over the course of the 10 year regulatory period by 0.2 percentage points per annum to 1.8% in year 10.	Applied to variable controllable opex. The target is not compounding but is cumulative. That is it is an annual static rate that increases by 0.2 percentage points per annum.[f]
Water Corporation (2018-22)[g]	WA	2.5%	Annual compounding rate applied to controllable opex.[g]
ICON Water (2016-23)[h]	ACT	1.75%	Annual compounding rate applied to controllable opex.
Electricity distributors (2019)[i]	NEM (Comm)	0.5%	Applied to the base efficiency adjusted opex forecast. The target represents ongoing efficiency, catch up efficiency is addressed through adjustments to the forecasting base year.

Note: [a] 2016 Price Submission, Melbourne Water. [b] ESCOSA 2016, Draft Determination: Statement of reasons. [c] It is not clear from ESCOSA's decision whether the rate has been applied in a static or compounding manner. [d] Atkins Cardno 2016, Sydney Water Corporation – Expenditure Review, Supplementary Report. [e] Value has been annualized by Atkins Cardno, actual per annum efficiencies were heavily weighted towards the last two years of the regulatory period. [f] QCA 2018, Seqwater Bulk Water Price Review 2018-21. Note that compounding treatment for efficiency differs materially from a cumulative approach over Seqwater's 10 year regulatory period. [g] ERA 2017 The efficient costs and tariffs of the Water Corporation, Aqwest and Busselton Water Draft Report. Targets are applied on a per connection basis consistent with the forecasting approach adopted by Water Corp. [h] ICON Water 2017 2018–23 Water and Sewerage Price Proposal. [i] AER 2019, Final decision paper, Forecasting productivity growth for electricity distributors Targets are applied to opex through the base-step-trend forecasting approach.

Source:

[a] https://www.melbournewater.com.au/media/281/download.

[b] https://www.escosa.sa.gov.au/ArticleDocuments/299/20160210-Water-SAWRD16-DraftDeterminationStatement%20of%20reasons.pdf.aspx?Embed=Y.

[d] https://www.ipart.nsw.gov.au/files/sharedassets/website/shared-files/investigation-legislative-requirements-water-metropolitan-water-sydney-water-corporation-pricing-investigation-commencing-from-1-july-2016/consultants_report_-_atkins_cardno_-_sydney_water_corporation_expenditure_review_-_july_2016.pdf.

[e] http://www.qca.org.au/getattachment/d0395075-14be-4c8c-b379-e97f1f0ca7d7/Final-report.aspx.

[g] https://www.erawa.com.au/cproot/18490/2/Inquiry%20into%20efficient%20costs%20and%20tariffs%20of%20the%20Water%20Corporation,%20Aqwest%20and%20Busselton%20Water%20-%20Final%20Report.pdf.
[h] https://www.icrc.act.gov.au/water-and-sewerage/regulated-water-and-sewerage-services-prices-2018-23/.
[I] https://www.aer.gov.au/system/files/Opex%20productivity%20growth%20review%202018%20-%20Final%20decision%20-%208%20March%202019.pdf.

We note that GAWB's proposed static 1% per annum efficiency gain is:

c) inconsistent with the compounding application used by other regulators; and

d) towards the lower end of those factors both set by other regulators and proposed by the Victorian water businesses in the recent PREMO review.

Our advice is that a higher efficiency factor should be applied to GAWB and for that factor to be applied on a compounding basis. This will further help to ensure that the proposed expenditure reflect efficient and prudent costs over the next five years. Our reasons are:

- A significant proportion of the actual opex incurred during the current period by GAWB and proposed for the period is aimed at systems improvement and new initiatives. The objective of such expenditure is to improve the quality and efficiency of GAWB delivery of its services, rather than as a response to new obligations or growth. A higher efficiency factor will provide a strong incentive on GAWB to ensure that such expenditure meets its objectives and delivers additional value for its customers.
- Any efficiency factor applied to GAWB could reflect an element of both catch up and continuous efficiency. As explained in our functional analysis in section 6.5, in a number of cases we have not been able to determine an efficient baseline expenditure level, and we know that the chosen base level is unlikely to be entirely efficient. In these cases, an efficiency factor that incorporates a catch-up element allows for some of the inefficiency in the baseline to be diminished over time.
- A higher compounding factor is consistent with practices of other regulators and what has been both proposed and achieved by water business in similar circumstances to GAWB.

Under these circumstances we believe there is a strong case for the adoption of a higher efficiency target for this next period. We recommend the QCA adopt an efficiency factor of 1.8% compounded annually, consistent with the average proposed in the 2018 PREMO review and also within the range applied by regulators for water businesses in the past.

This factor could be viewed as a temporary target over the next five years in reflection of the transformation focus of the business and the range of initiatives and investment implemented and planned. This efficiency factor therefore complements KPMG's advice regarding the assessment of proposed expenditure on a number of systems and process upgrades as described in the opex section.

Appendix B Documents and data reviewed for opex analysis

Document
GAWB, regulatory submission 2021-25 period Part A
Deloitte Access Economics, Cost escalation factors (2020-21 to 2024-25) Prepared for Gladstone Area Water Board, 15 August 2019
Jacobs, GAWB 2015-20 Review of Capex and Opex, Final Report Prepared for the QCA, May 2015
Deloitte Access Economics, Business outlook September 2019 – Oz muddles through global uncertainty
QCA Archive – previous reviews (File)
ALCM staffing summary - includes historical costs and forecast
Electricity tariff calculation post AER decision
O2.1 Maintenance forecast detail 2015 - 2020
O3.1 Insurance summary - includes historical costs and forecast
O3.4 Allowance for insurance excess claim
O3.5 Marsh Insurance letter re escalation rate
O3.6 GAWB Insurance Procurement Process
O4 2 Motor Vehicles forecast detail
O4.1 Motor Vehicles forecast summary - includes historical costs and forecast
O6.1 Electricity summary - includes historical costs and forecast
O6.3 Electricity forecast detail for ADPS, GWTP and YWTP
O7.1 Chemicals summary - includes historical costs and forecast
O7.2 Chemicals forecast detail
O7.3 Chemicals purchase history
ALCM staffing summary - includes historical costs and forecast
Electricity tariff calculation post AER decision
RFI0013 Contracts and procurement templates (File)
1_Scope of Work
2_Request to Procure Form
3_Tender Evaluation Matrix
4_Justification for Contract Variation
5_Memorandum
6_Contractor Evaluation Form RO
Vendor Masterfile Request form rev1
RFI0017-0023 - Specific procurement arrangements (File)
Authorisation for Power Select to act on behalf of GAWB
Draft _ Fleet Accident Management
Draft _ Maintenance of Fleet Vehicles

Document
Draft _ Process for New Business Vehicle
Draft _Process for New Salary Sacrifce Vehicle
Draft Fleet Procedure - Final
Draft _Process for Replacement of Existing Business Vehicle
Draft_Process for Replacement of Existing Salary Sacrifce Vehicle
Draft_Process for Return of Vehicle at End Of Lease
Executed Board Paper AGL 3Yrs
Executed Memorandum to Engage AGL (3yrs)
RFI0017-23 File Note - Procurement for key services
RFI0052 Forecast Opex 2020-24 (File)
Opex (Prior Methodology).pdf
File Note - Opex.xlsx
File Note - Opex.pdf
RFI0053 Controllable v Non Controllable (File)
RFI 0053 File Note - Controllable vs Uncontrollable
RFI0057 Opex forecast methodology (File)
Opex Forecast Impact of demand and productivity
Opex Forecasting Methodolgy
RFI0060 ICT Strategic Plan (File)
01 Item 3.03 ICT Strategy
RFI0072 Project Estimating Tool (File)
RFI 0072 Project Estimating Tool - Monthly
RFI 0072 Project Estimating Tool - Weekly
RFI0074 Project management framework (File)
GAWB Flowchart PM Phase Detail, Level 1
GAWB Flowchart PM Phase Detail, Level 2
GAWB Flowchart PM Phase Detail, Level 3
GAWB Level 1 Flowchart
GAWB Level 2 Flowchart
GAWB Level 3 Flowchart
RFI0083 ICT Business Cases (File)
SAN Refresh _Fully Executed Contract - iQ3 Pty Ltd - Service Provider Agreemeent
SAN Refresh _Fully Executed Memorandum (CEO Approval)
SAN REfresh_New Idea Form
SAN Refresh_Request to Procure
SAN Refresh_Scope of Works
CAP2018-033 PJP
COM2017-106_ApprovedPP
IPD2016-060 SCADA Software Upgrade Project Plan Fully Signed
KPMG 2017 GAWB functional model_FINAL FOR ACCEPTANCE
RFI0084 FTE Data (File)

Document
RFI 0084 - Historic and Forecast FTEs and Employment Costs
RFI0085-86 OPEX Actual and Forecast (File)
RFI 0085 (Sup) - Actual Opex by GL
RFI 0085-0086 - Actual and Forecast Ope
RFI0087 Opex insurance (File)
INVOICE_COMBINED_LIABILITY_3162735_1
INVOICE_CRIME_3160952
INVOICE_Cyber_Insurance_3160975_1
INVOICE_DIRECTORS_OFFICERS_LIAB_3160949_1
INVOICE_DIRECTORS_OFFICERS_LIAB_3160950_1
INVOICE_FEE_3160504_1
INVOICE_FINPRO_PACKAGE_MULTI_RISK_3160951_1
INVOICE_GA_INDUSTRIAL_SPECIAL_RISKS_3160505_1
INVOICE_GA_MOTOR_VEHICLE_3160388_1
INVOICE_GA_MOTOR_VEHICLE_3160506_1
INVOICE_GC_BUSINESS_TRAVEL_POLICY_3160508_1
INVOICE_GC_PERSONAL_ACCIDENT_3160510_1
INVOICE_MARINE_HULLS_3160511_1
INVOICE_MARINE_INLAND_3160512_1
Marsh Insurance Renewal Report - Gladstone Area Water Board
RFI0089 Demand Forecast (File)
RFI0019 190911-GAWB-Demand Forecast - Pricing Model Output
OTHER
Queensland Procurement Policy 2019
RFI 0002 Material Projects & Consultants 30092019
RFI 0007 Risk Management
RFI 008 CAM
RFI 0013 Procurement - Summary
RFI Register - Incoming - 21 October 2019 - GAWB comments
RFI0009 GAWB PM Framework
RFI0013 Agency Procurement Plan 2018_2019
RFI0013 Authorities and Delegations Manual
RFI0013 Contract Management Framework
RFI0013 Contract Management Procedure Flowchart
RFI0013 Financial Management Practice Manual (For Procurement 5-5 5-7 only)
RFI0013 Guideline to GAWB Procurement Thresholds
RFI0013 RFQ to Contract Timeframes
RFI0014 HR Recruitment & workplace policies and procedures
RFI0014 Templates - Recruitment & Code of Ethics and Conduct
RFI0020 OPEX GL Data_Unescalated_2021-25
2019-11-28 DOC013 Actual and Forecast Opex by GL_Updated with Narrative

Document
National Performance Report
Urban NPR 2017-18: Full dataset
Urban NPR 2018-19: Full dataset

Contact us

Eamonn Corrigan
Head of Utilities, Policy and Regulation
+ 61 (2) 9335 8555
ecorrigan1@kpmg.com.au

Tim White
Director Utilities, Policy and Regulation
+61 408 066 960
twhite1@kpmg.com.au

David Dawson
Associate Principal, ARUP
+61 417 285 194
David.dawson@arup.com

kpmg.com.au