

Gladstone Area Water Board FY26–FY30 price monitoring investigation

1 August 2024

Summary

- Queensland Treasury Corporation (QTC) welcomes the opportunity to provide input into the Queensland Competition Authority's (QCA) price monitoring investigation of the monopoly business activities of Gladstone Area Water Board (GAWB) for the period 1 July 2025 to 30 June 2030.
- QTC's recommendations for the allowed cost of debt are as follows:
 - a 10-year weighted trailing average should be used, with weights based on annual changes in forecast benchmark debt
 - linear extrapolation of the Reserve Bank of Australia's (RBA) BBB total yields, rather than debt risk premiums (DRP), is the simplest and most appropriate way to estimate the benchmark 10-year BBB yield, and
 - an annuity-based true-up can account for cost of debt mismatches during the price monitoring period if the trailing average is not updated annually.
- A weighted trailing average and linear extrapolation of BBB total yields are departures from the QCA's preferred approaches. QTC's reasons for recommending these departures are summarised in the following sections.

Weighted trailing average cost of debt approach

- The trailing average cost of debt approach replicates the cost produced by a portfolio of ten fixed-rate bonds with annual maturities from 1–10 years. Each year the maturing bond, which funds 10 per cent of benchmark debt, is refinanced with a new 10-year bond issued at the prevailing 10-year corporate yield.
- Under a simple trailing average, which is the QCA's preferred approach, new borrowings above the 10 per cent annual refinancing are immediately compensated at historical 10-year BBB yields. However, it is not possible for a new borrowing to be made today at yields that prevailed in the past.
- As a consequence, a simple trailing average will not provide correct compensation for the efficiently incurred cost of debt when large new investments are made. This can weaken the incentives for efficient investment, especially when the difference between the simple trailing average and prevailing cost of debt is large.
- GAWB is expecting to make large new investments in FY26–FY30, which will cause benchmark debt to increase. A simple trailing average will not provide correct compensation if the prevailing 10-year BBB yield differs from the simple trailing average when the investments are added to the regulated asset base (RAB).
- To address this issue, QTC recommends using a weighted trailing average approach, with weights based on annual changes in forecast benchmark debt. The allowed cost of debt under this approach is identical to:
 - applying the prevailing 10-year BBB yield to GAWB's opening benchmark debt on 1 July 2025 and transitioning to a simple 10-year trailing average over the next ten years
 - applying the future prevailing 10-year BBB yield to each future increase in GAWB's benchmark debt and transitioning to a simple 10-year trailing average over the next ten years, and
 - aggregating the outcomes into a single allowed cost of debt.

Estimating the benchmark 10-year BBB yield

- The QCA uses monthly corporate yields produced by the RBA to estimate the benchmark 10-year BBB yield. As the effective tenor of the RBA's 10-year BBB yield has been consistently shorter than ten years, extrapolation is required to estimate the BBB yield for an exact 10-year tenor.
- QTC recommends linear extrapolation of the RBA's BBB total yields to estimate the benchmark 10-year BBB yield. This is a departure from the QCA's preferred approach of extrapolating BBB DRPs to the Commonwealth Government Security (CGS) yield curve.
- The QCA uses interpolated 7-year and 10-year CGS yields to estimate the DRPs. However, the average effective tenor of the RBA's 7-year and 10-year BBB yields are 6.80 years and 8.84 years, respectively. As the slope of the CGS yield curve is usually positive, deducting 7-year and 10-year CGS yields from BBB yields with shorter effective tenors creates a downward bias, and the bias has been larger for the 10-year BBB DRP.
- The workbook that forms part of this submission demonstrates that:
 - linear extrapolation of total BBB yields produces nearly identical estimates to 'unbiased' DRP extrapolation, where the tenor of the interpolated CGS yields matches the effective tenor of the RBA's BBB yields, and
 - the QCA's preferred approach has consistently under-estimated the extrapolated 10-year BBB yield.
- In QTC's view, linear extrapolation of the RBA's 7-year and 10-year BBB total yields is the simplest and most appropriate way to estimate the benchmark BBB yield for an exact 10-year tenor.

True-up process for cost of debt mismatches

- The annual refinancing of 10 per cent of benchmark debt at the prevailing 10-year BBB yield will cause the trailing average cost of debt to change each year.
- GAWB has advised that it cannot change prices during the price monitoring period to reflect an annually updated allowed cost of debt. Therefore, the allowed cost of debt will need to be fixed for the term of the price monitoring period based on the trailing average at the start of the price monitoring period. This will produce annual mismatches between the 'true' and fixed trailing averages.
- An annuity-based true-up can account for these mismatches. This involves calculating the cumulative dollar mismatch at the end of each price monitoring period, and converting this amount to an annual annuity that is added to the allowed revenues in the following price monitoring period.

1. Referral Notice

- In December 2023, the QCA received a Referral Notice referring the relevant monopoly business activities of GAWB to the QCA for a price monitoring investigation for the period 1 July 2025 to 30 June 2030. The requirements for determining the allowed rate of return are as follows:

'A Weighted Average Cost of Capital based on the methodologies outlined in the Authority's Rate of Return Final Report 2023.

For estimating the cost of debt, a 10-year transition from the 'on-the-day' approach to the 'trailing average' approach (consistent with the Australian Energy Regulator's transition arrangements) applies.'

1.1 QCA allowed cost of debt approach

- A significant outcome from the QCA's Rate of Return Review was the decision to move away from an 'on-the-day' cost of debt approach to a 10-year trailing average cost of debt approach. The QCA's preferred position is to use:
 - a simple (ie, unweighted) trailing average approach with no transition¹, and
 - linear extrapolation of BBB DRPs to estimate the benchmark 10-year BBB yield.
- QTC's recommendations to use a weighted trailing average, and linear extrapolation of total yields rather than DRPs, are departures from the QCA's preferred approaches.

1.2 Cost of debt transition

- The Referral Notice requires the QCA to use the Australian Energy Regulator's (AER) transition from the on-the-day approach to the trailing average approach. This involves the following steps:
 - The ten initial yields in the trailing average are set to equal the average benchmark 10-year corporate yield in the first averaging period.
 - In each subsequent year, one yield drops out of the trailing average and is replaced with the prevailing 10-year corporate yield in the annual averaging period.
 - This results in the allowed cost of debt transitioning from the prevailing 10-year corporate yield to a 10-year trailing average of the 10-year corporate yield over the next ten years.
- The ten initial yields in the trailing average will equal the average 10-year BBB yield during GAWB's nominated averaging period prior to the start of the price monitoring period on 1 July 2025.
- The workbook that forms part of this submission demonstrates that QTC's weighted trailing average approach is identical to applying the AER's transition to the opening benchmark debt on 1 July 2025, and to each future increase in benchmark debt. Therefore, QTC's approach is consistent with the cost of debt transition requirement in the Referral Notice even though future increases in benchmark debt are not explicitly mentioned.

¹ Applying no transition means the starting value of the trailing average equals the average 10-year BBB yield over the previous 10 years.

2. Trailing average cost of debt approach

- The trailing average cost of debt approach replicates the cost produced by a portfolio of ten fixed-rate bonds with annual maturities from 1–10 years. Each year the maturing bond, which funds 10 per cent of benchmark debt, is refinanced with a new 10-year bond issued at the prevailing 10-year corporate yield.
- A trailing average can be calculated using a simple or weighted approach:
 - Under a simple trailing average:
 - > the annual borrowing to refinance the 10 per cent of maturing debt is compensated at the prevailing 10-year BBB yield, and
 - > any additional borrowing is immediately compensated at the *historical average* 10-year BBB yield.
 - Under a weighted trailing average:
 - > the annual borrowing to refinance the 10 per cent of maturing debt is compensated at the prevailing 10-year BBB yield, and
 - > any additional borrowing is initially compensated at the *prevailing* 10-year BBB yield, with the compensation moving to a 10-year trailing average of the BBB yield over the next 10 years.
- When benchmark debt is relatively stable, both trailing averages will produce similar cost of debt estimates. However, if large new investments are made when the prevailing cost of debt is significantly different from the simple trailing average, the difference between a simple and weighted trailing average can be material.
- Assuming that a new borrowing can be made today at yields that prevailed in the past is a weakness in the simple trailing average approach. This has been recognised by the AER²:

‘The [simple] trailing average implicitly assumes firms raise 10% of their debt capital each year on a rolling basis. However, where firms make large new investments this assumption does not hold. In this situation, and where interest rates have changed significantly over the period of the current trailing average, firms may be materially incorrectly compensated on these new investments.’

- The ‘materially incorrect compensation’ is caused by the difference between the simple trailing average cost of debt and the prevailing cost of debt. As noted by the Australian Energy Market Commission (AEMC), minimising the impact of these differences is important as it strengthens the incentives for efficient investment³:

‘The impact on the incentives for efficient capex is also an important consideration. The incentives for efficient capex are stronger when the difference between the return on debt and the debt servicing costs of the service provider is minimised.’

- The AER is also aware of the importance of compensating new borrowings at the prevailing cost of debt to strengthen the incentives for efficient investment:⁴

‘We consider an allowed return on debt that reflects the prevailing market cost of debt promotes efficient investment decisions. When firms make investment decisions, they estimate the cost of capital based on prevailing market rates.’

- GAWB is expecting to make large new investments in FY26–FY30, which will cause benchmark debt to increase. A simple trailing average will not provide correct compensation if the prevailing 10-year BBB yield differs from the simple trailing average when the investments are added to the RAB.

² AER, *Consultation on TransGrid and ElectraNet participant derogations – Financeability of ISP projects*, December 2020, p. 17.

³ AEMC, *Final Rule Determination*, November 2012, p. 77.

⁴ AER, *Attachment 3 – Rate of return | Final decision: AusNet Services transmission determination 2017–22*, April 2017, p. 294.

2.1 Providing correct compensation for new investments

- In a December 2020 submission to the AEMC, the AER made the following observation on how a trailing average can be implemented for a firm that makes large new investments⁵:

'The [simple] trailing average implicitly assumes firms raise 10% of their debt capital each year on a rolling basis. However, where firms make large new investments this assumption does not hold. In this situation, and where interest rates have changed significantly over the period of the current trailing average, firms may be materially incorrectly compensated on these new investments.'

A resolution to this issue is to provide all new investments the spot rate on debt and then transition these new investments to a trailing average. This would be consistent with our approach when we introduced the trailing average in our regulatory determinations post 2013. For all decisions made since 2013 we have started (or continued) the transition of the return on debt from the 'on the day', or spot rate, to a 10 year trailing average over 10 years.'

- This approach treats each increase in benchmark debt as an individual borrowing with its own allowed cost of debt. For each borrowing, the allowed cost of debt starts at the corresponding prevailing 10-year BBB yield and progressively moves to a trailing average of the 10-year BBB yield over the next ten years. In a given year:
 - the cost of debt allowance equals the sum of the cost of debt allowances for the individual borrowings, and
 - the allowed cost of debt equals the total cost of debt allowance divided by total benchmark debt, which equals the weighted average allowed cost of debt based on the individual borrowings.
- The workbook that forms part of this submission demonstrates that the allowed cost of debt under this approach is identical to the allowed cost of debt under the weighted trailing average developed by QTC in 2013⁶. This means that QTC's approach is consistent with the cost of debt transition requirement in the Referral Notice for GAWB's opening benchmark debt on 1 July 2025, and each future increase in benchmark debt.

2.2 QTC's weighted trailing average approach

- QTC's approach uses weights based on annual changes in forecast benchmark debt. The weights determine the yields on the ten bonds in the portfolio that result in each increase in benchmark debt being initially compensated at the prevailing cost of debt, with the compensation moving to a 10-year trailing average over the next ten years.
- Table 1 shows a one-period example of the weighted trailing average calculation. In this example:
 - The 10-year BBB yields are from the QCA's February 2024 update to the Rate of Return Review Final Report⁷.
 - The allowed cost of debt on starting debt of \$100 has fully transitioned to a 10-year trailing average.
 - There were no changes in benchmark debt during the 10-year transition period.
 - Each bond funds 10 per cent of total benchmark debt.
 - The annual 10 per cent refinancing has just occurred at the prevailing 10-year BBB yield of 6.91 per cent.
 - An additional borrowing of \$50 is made at the same time as the annual refinancing.
 - The amount funded by each bond in the portfolio increases by \$5 (ie, $\$50 \div 10$).

⁵ AER, *Consultation on TransGrid and ElectraNet participant derogations – Financeability of ISP projects*, December 2020, p. 17.

⁶ QTC, *Submission to the Draft Rate of Return Guideline*, October 2013, pp. 28–29. More detail on the case for using a weighted trailing average cost of debt approach is provided in Appendix B.

⁷ Appendix C, Table 16, pp. 119–120.

TABLE 1: WEIGHTED TRAILING AVERAGE CALCULATION

Bond tenor (years)	Historical benchmark yields (%)	Weighted average yield calculations	Weighted average benchmark yields (%)
1	6.70	$(\$10 \times 6.70 + \$5 \times 6.91) \div \$15$	6.77
2	4.91	$(\$10 \times 4.91 + \$5 \times 6.91) \div \$15$	5.57
3	5.07	$(\$10 \times 5.07 + \$5 \times 6.91) \div \$15$	5.68
4	4.67	$(\$10 \times 4.67 + \$5 \times 6.91) \div \$15$	5.41
5	4.54	$(\$10 \times 4.54 + \$5 \times 6.91) \div \$15$	5.32
6	4.29	$(\$10 \times 4.29 + \$5 \times 6.91) \div \$15$	5.15
7	3.22	$(\$10 \times 3.22 + \$5 \times 6.91) \div \$15$	4.44
8	2.70	$(\$10 \times 2.70 + \$5 \times 6.91) \div \$15$	4.09
9	5.28	$(\$10 \times 5.28 + \$5 \times 6.91) \div \$15$	5.82
10 (prevailing)	6.91	$(\$10 \times 6.91 + \$5 \times 6.91) \div \$15$	6.91
Allowed cost of debt	4.83		5.52

- The allowed cost of debt increases to 5.52 per cent because the additional \$5 funded by each bond is compensated at the prevailing yield of 6.91 per cent, which is higher than the previous allowed cost of debt of 4.83 per cent.
- Table 2 shows that a simple trailing average implicitly performs the same weighted average yield calculations in Table 1. The only difference is the yields that are used in the calculations.

TABLE 2: SIMPLE TRAILING AVERAGE CALCULATION

Bond tenor (years)	Historical benchmark yields (%)	Implied weighted average yield calculations	Weighted average benchmark yields (%)
1	6.70	$(\$10 \times 6.70 + \$5 \times 6.70) \div \$15$	6.70
2	4.91	$(\$10 \times 4.91 + \$5 \times 4.91) \div \$15$	4.91
3	5.07	$(\$10 \times 5.07 + \$5 \times 5.07) \div \$15$	5.07
4	4.67	$(\$10 \times 4.67 + \$5 \times 4.67) \div \$15$	4.67
5	4.54	$(\$10 \times 4.54 + \$5 \times 4.54) \div \$15$	4.54
6	4.29	$(\$10 \times 4.29 + \$5 \times 4.29) \div \$15$	4.29
7	3.22	$(\$10 \times 3.22 + \$5 \times 3.22) \div \$15$	3.22
8	2.70	$(\$10 \times 2.70 + \$5 \times 2.70) \div \$15$	2.70
9	5.28	$(\$10 \times 5.28 + \$5 \times 5.28) \div \$15$	5.28
10 (prevailing)	6.91	$(\$10 \times 6.91 + \$5 \times 6.91) \div \$15$	6.91
Allowed cost of debt	4.83		4.83

- Under a simple trailing average, the additional \$5 funded by each bond is compensated at the corresponding historical 10-year BBB yield. This is equivalent to compensating the new \$50 borrowing at the historical average 10-year BBB yield of 4.83 per cent even though it is not possible for the borrowing to be made at this yield.
- The workbook that forms part of this submission provides a detailed example of QTC's weighted trailing average approach, which is a multi-year application of the calculations in Table 1.

2.3 QCA assessment of the weighted trailing average approach

- The QCA has concluded that compared to a simple trailing average, a weighted trailing average⁸:
 - is substantially more complex to implement and may lack transparency
 - is sensitive to errors in estimating actual debt proportions
 - represents a departure from the benchmarking approach, as the weights used in a trailing average would be different for each individual regulated entity
 - would likely need to be implemented via a retrospective true-up, since weights can only be computed after the parameters they are based on have been observed, and
 - is not consistent with regulatory practice in Australia.
- For the reasons set out in Appendix A, QTC does not agree with the QCA’s assessment.

2.4 Why a weighted trailing average should apply to GAWB

- GAWB is expecting to make large new investments in FY26–FY30, which will cause benchmark debt to increase. As recognised by the QCA, a weighted trailing average will provide an allowed cost of debt that is more reflective of the efficiently incurred cost of debt compared to a simple trailing average⁹:

‘Advantages of the weighted trailing average approach are that it minimises the potential mismatch between the regulatory cost of debt allowance and incurred debt costs; therefore, it provides efficient investment signals, as borrowings for new capital expenditure are compensated at the prevailing rate.’

‘Not applying weights in these instances leads to a mismatch between the regulatory cost of debt allowance and the cost of debt incurred, which potentially could lead to investment distortions.’

- Compensating efficient costs is fundamental to economic regulation. For the allowed cost of debt, this requires estimating the efficiently incurred cost of debt for a benchmark firm in the same circumstances as the entity being regulated. This cost is the *outcome* from implementing an efficient debt strategy¹⁰:

‘Before estimating a regulatory cost of debt allowance, it is necessary to choose a benchmark debt management strategy as the basis for this estimation process... Once a benchmark debt management strategy has been chosen, the cost of debt (and hence a cost of debt allowance) can be estimated.’

- There is no debt strategy that allows a new borrowing to be made today at yields that prevailed in the past. However, a simple trailing average provides compensation ‘as if’ this can be done.
- As such, when large investments are made, the debt strategy implied by a simple trailing average is not suitable for estimating the efficiently incurred cost of debt because the strategy cannot be implemented in practice.
- In QTC’s view, the most appropriate approach is a weighted trailing average, with weights based on annual changes in forecast benchmark debt. The allowed cost of debt under this approach is identical to:
 - applying the prevailing 10-year BBB yield to GAWB’s opening benchmark debt on 1 July 2025 and transitioning to a simple 10-year trailing average over the next ten years
 - applying the future prevailing 10-year BBB yield to each future increase in GAWB’s benchmark debt and transitioning to a simple 10-year trailing average over the next ten years, and
 - aggregating the outcomes into a single allowed cost of debt.

⁸ QCA, *Rate of return review – Version 3*, February 2024, p. 53.

⁹ QCA, *Rate of return review – Version 3*, February 2024, p. 52.

¹⁰ QCA, *Rate of return review – Version 3*, February 2024, pp. 33–34.

3. Estimating the benchmark 10-year BBB yield

- The QCA uses monthly corporate yields produced by the RBA to estimate the benchmark 10-year BBB yield. As the effective tenor of the RBA's 10-year BBB yield has been consistently shorter than ten years (Figure 1), extrapolation is required to estimate the BBB yield for an exact 10-year tenor.

FIGURE 1: EFFECTIVE TENOR OF THE RBA'S 10-YEAR BBB YIELD ESTIMATES



Source: RBA

- The QCA's previous approach used linear extrapolation of the RBA's 7-year and 10-year BBB DRPs (relative to the swap yield curve) and effective tenors to estimate the 10-year BBB yield.
- The RBA has advised that it will no longer publish DRP estimates. The QCA will produce its own DRP estimates using the RBA's BBB total yields and interpolated 7-year and 10-year CGS yields.

3.1 Downward bias in the QCA's extrapolation approach

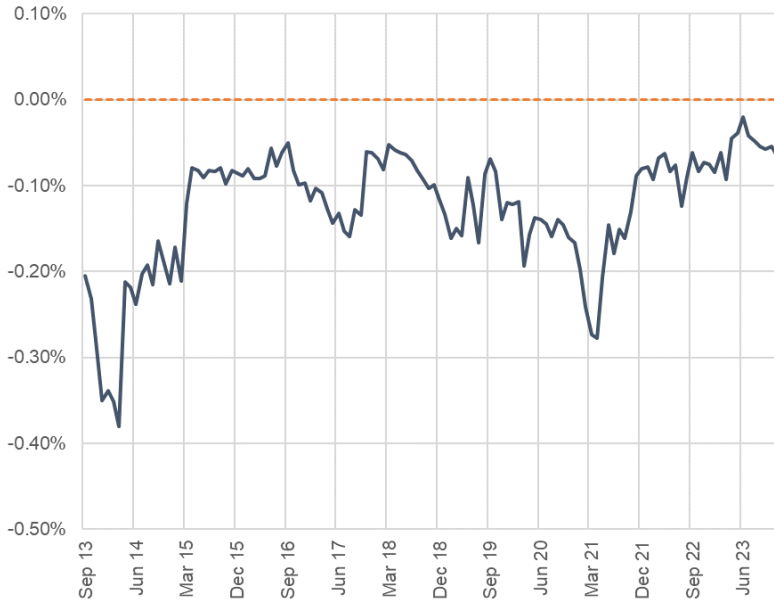
- The average effective tenor of the RBA's 7-year and 10-year BBB yields are 6.80 years and 8.84 years respectively¹¹. As the slope of the CGS yield curve is usually positive, deducting 7-year and 10-year CGS yields from BBB yields with shorter effective tenors creates a downward bias, and the bias has been larger for the 10-year BBB DRP¹².
- Unbiased DRP extrapolation requires the effective tenor of the BBB total yield and corresponding CGS yield to be the same. The workbook that forms part of this submission replicates the QCA's approach using unbiased DRPs. The interpolated CGS yields are based on par CGS yields with quarterly tenors between 5–10 years that have been determined using the zero coupon CGS yield curves produced by the RBA¹³. The extrapolated 10-year BBB yield equals the 10-year CGS yield plus the extrapolated 10-year DRP.
- Figure 2 shows the difference between the extrapolated 10-year BBB yield using the QCA and unbiased DRP approaches. On average, the QCA's estimate is 13 basis points lower than the unbiased DRP estimate.

¹¹ Both averages are for the period September 2013–December 2023 to match the estimates in the QCA cost of debt workbook.

¹² The effective tenor of the RBA's 7-year BBB yields is only 0.20 years shorter than 7 years, whereas the effective tenor of the 10-year BBB yield is 1.16 years shorter than 10 years.

¹³ Zero-coupon Interest Rates – Analytical Series – 2009 to Current – F17.

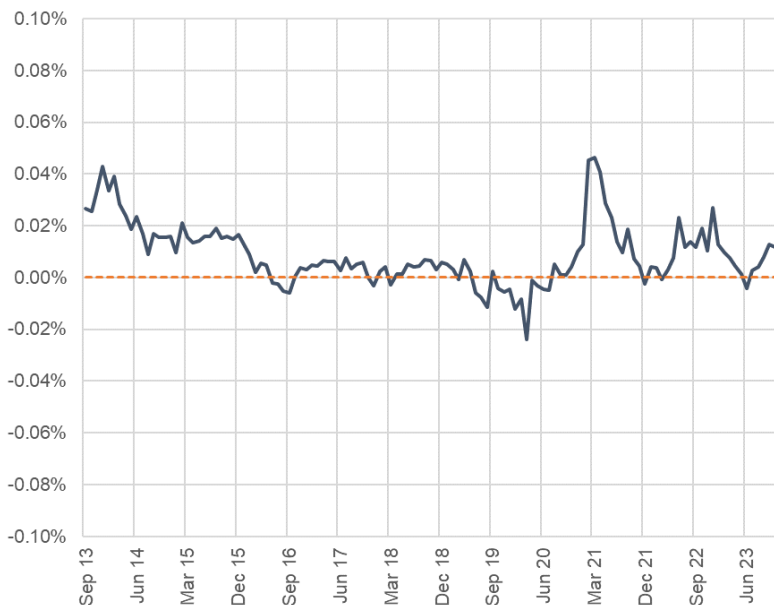
FIGURE 2: DIFFERENCE BETWEEN 10-YEAR BBB YIELDS USING QCA AND UNBIASED DRP EXTRAPOLATION



Source: QCA cost of debt workbook, RBA, QTC calculations.

- Estimating interpolated CGS yields to produced unbiased DRPs requires additional calculations and data. A simpler approach that produces nearly identical estimates is to extrapolate using the RBA’s 7-year and 10-year BBB total yields and effective tenors. Figure 3 shows the difference between the extrapolated 10-year BBB yield using the total yield and unbiased DRP approaches. The average difference is only 0.01 per cent.

FIGURE 3: DIFFERENCE BETWEEN 10-YEAR BBB YIELDS USING TOTAL YIELD AND UNBIASED DRP EXTRAPOLATION



Source: RBA, QTC calculations.

- In QTC’s view, linear extrapolation of the RBA’s 7-year and 10-year BBB total yields is the simplest and most appropriate way to estimate the benchmark BBB yield for an exact 10-year tenor¹⁴.

¹⁴ The RBA produces month-end BBB yield estimates. Appendix C shows how these estimates can be used to produce daily 10-year BBB yields.

4. True-up process for cost of debt mismatches

- The annual refinancing of 10 per cent of benchmark debt at the prevailing 10-year BBB yield will cause the trailing average cost of debt to change each year. However, GAWB cannot change prices during the price monitoring period to reflect changes in the allowed cost of debt¹⁵:

‘Contrary to the QCA’s claim that updating the cost of debt annually would be a straightforward process, GAWB’s prices are set at the start of each regulatory period and can contractually only be increased by the consumer price index (CPI) within the regulatory period. Hence, in practice, a revenue ‘true-up’ that aggregated the revenue effect of each of the annual cost of debt adjustments within the preceding regulatory period would need to occur at the start of each new regulatory period.’

- GAWB’s contractual constraints will require the trailing average allowed cost of debt to be fixed for the term of the price monitoring period. This will produce annual mismatches between the ‘true’ and fixed trailing average debt costs during each price monitoring period.
- A true-up process that properly accounts for these mismatches is important as¹⁶:

‘... GAWB’s support for the trailing average approach is contingent on regulated businesses retaining the flexibility to manage the associated revenue true-up process as they see fit.’

- An annuity-based true-up can account for cost of debt mismatches by:
 - Calculating the trailing average cost of debt that would have applied if annual updates had been made.
 - Calculating the dollar value of the mismatch each year by multiplying opening benchmark debt by the difference between the annually updated and fixed trailing averages.
 - Calculating the cumulative dollar value of the mismatch, which can be positive or negative, using the WACC at the start of the price monitoring period as the funding rate.
 - Converting the cumulative dollar value of the mismatch to an annual annuity for the term of the next price monitoring period using the WACC that will apply in the next price monitoring period.
 - Adding the annual annuity to the allowed revenues in the next price monitoring period.
- The allowed WACC at the start of each price monitoring period will reflect the prevailing return on equity and the historical average cost of debt. To calculate the cumulative dollar value of the mismatches and the annuity, a WACC that reflects the prevailing cost of debt should be used.
- The trailing average cost of debt requires annual estimates of the 10-year BBB yield during GAWB’s nominated averaging periods. The average 10-year BBB yield in the averaging period prior to the start of the next price monitoring period can be used to calculate a WACC that reflects the prevailing return on equity and cost of debt.
- The workbook that forms part of this submission sets out an example of the true-up calculations.

¹⁵ GAWB, *Response to the QCA’s Draft Decision*, August 2021, p. 4.

¹⁶ GAWB, *Response to the QCA’s Draft Decision*, August 2021, p. 5.

Appendix A – QCA’s assessment of the weighted trailing average a

- QTC’s responses to the QCA’s assessment of the weighted trailing average are set out in the following sections¹⁷:

Substantially more complex to implement and may lack transparency

- In QTC’s view, it cannot be reasonably argued that a weighted trailing average is ‘substantially’ more complex to implement than a simple trailing average. The example in Table 1 and Table 2 shows that the underlying calculation methods are the same for both approaches. The only difference is the benchmark yields that are used as inputs.
- Perceived complexity in implementing a weighted trailing average has been addressed in previous regulatory consultations. For example, the Economic Regulation Authority of Western Australia (ERAWA) concluded that any added complexity¹⁸:

‘... is not insurmountable. Indeed, QTC and DBP both demonstrate that the spreadsheet calculation relating to weights would be straightforward, at least for the PTRM approach.’

- Similarly¹⁹:

‘...this “added complexity” is, in reality, a very simple adding up problem which is no more complicated (and actually less complicated) than other aspects of building block models.’

- The workbook that forms part of this submission shows how QTC’s weighted trailing average can be implemented across multiple price monitoring periods. The calculations are simple, transparent, and based on benchmark parameters that are known at the start of each price monitoring period.

Sensitive to errors in estimating actual debt proportions

- QTC’s weighted trailing average is based on annual changes in forecast benchmark debt. Actual debt balances and proportions (ie, gearing) are not used.
- It could be argued that ex-post errors in forecast benchmark debt are relevant given that QTC’s weighted trailing average uses the forecasts to determine the weights at the start of each price monitoring period.
- To make this assessment, it is necessary to consider the allowed cost of debt outcomes for a range of scenarios where actual borrowings differ from forecast borrowings under both trailing average approaches. In doing so, it is important to keep in mind that the forecast benchmark debt balances are used to determine the dollar value of the cost of debt allowance under both trailing average approaches.
- Table 3 shows an example of the potential mismatch for the simple and weighted trailing average approaches when the actual new borrowing differs from the forecast new borrowing. The benchmark yields and debt balances are based on the example in Tables 1 and 2 on page 6.

¹⁷ QCA, *Rate of return review – Version 3*, February 2024, p. 53.

¹⁸ ERAWA, *Estimating the return on debt – Discussion paper*, March 2015, p. 14. The ‘PTRM approach’ uses weights based on changes in the benchmark debt balance in the Post Tax Revenue Model, which is the building block model used by ERAWA and the AER. This is the same approach that QTC is recommending in this submission.

¹⁹ Competition Economists Group (CEG), *Cost of debt consistent with the NGR and NGL*, November 2014, pp. 37-38.

TABLE 3: ALLOWED COST OF DEBT ERRORS WHEN ACTUAL NEW BORROWING DIFFERS FROM \$50 FORECAST NEW BORROWING

Actual borrowing (\$)	Actual vs forecast (%)	Weight to historical average yield – 4.83%	Weight to prevailing yield – 6.91%	Correct allowed cost of debt (%)	Simple trailing average error (%)	Weighted trailing average error (%)
0	(100)	1.00	0.00	4.83	0.00	0.69
10	(80)	0.91	0.09	5.02	(0.19)	0.50
20	(60)	0.83	0.17	5.18	(0.35)	0.35
30	(40)	0.77	0.23	5.31	(0.48)	0.21
40	(20)	0.71	0.29	5.42	(0.59)	0.08
50	0	0.67	0.33	5.52	(0.69)	0.00
60	20	0.62	0.38	5.61	(0.78)	(0.10)
70	40	0.59	0.41	5.69	(0.86)	(0.17)
80	60	0.56	0.44	5.75	(0.92)	(0.23)
90	80	0.53	0.47	5.81	(0.99)	(0.29)
100	100	0.50	0.50	5.87	(1.04)	(0.35)
Average error					(0.63)	0.06

Note: The simple (weighted) trailing average values of 4.83 per cent (5.52 per cent) are taken from the example in Tables 1 and 2 on page 6.

- The ‘correct allowed cost of debt’ is the weighted average of the historical and prevailing 10-year BBB yields based on actual borrowings of \$0–\$100. The final two columns show the difference between the correct allowed cost of debt and the simple (4.83 per cent) and weighted (5.52 per cent) trailing average cost of debt.
- Forecast borrowings should be the best ex-ante estimates of actual borrowings. As such, Table 3 shows that:
 - a weighted trailing average produces the correct estimate of the allowed cost of debt when actual borrowings equal forecast borrowings (ie, the most likely scenario), and across a wide range of plausible scenarios, while
 - a simple trailing average only produces a better estimate of the allowed cost of debt when new borrowings are significantly lower than the best estimates (ie, close to zero).
- The outcomes in Table 3 demonstrate that a weighted trailing average is likely to be less sensitive to errors between actual and forecast new borrowings compared to a simple trailing average.

Represents a departure from the benchmarking approach, as the weights used in a trailing average would be different for each individual regulated entity

- As shown in Table 1, annual changes in benchmark debt determine the weights that apply to the prevailing and historical 10-year BBB yields to determine the ten benchmark yields in the weighted trailing average. As the weights will not be the same for all regulated entities, the benchmark yields will be different for each regulated entity.
- The QCA’s position may be that having different yields in the trailing average for different regulated entities is a departure from a benchmarking approach²⁰. If so, this is inconsistent with the QCA’s view that²¹:

‘... the cost of debt for a regulated entity should be set by referencing the debt management strategy of a benchmark efficient firm, as opposed to the actual strategy adopted by the regulated entity in question.’

- The debt strategy of a benchmark efficient firm involves issuing debt to fund new investment. As this debt can only be issued at prevailing yields, regulated entities with benchmark debt that changes by different amounts will

²⁰ This ignores differences due to entities having different averaging periods for the annual updating of the trailing average cost of debt, and differences due to entities being at different stages of the 10-year transition period.

²¹ QCA, *Rate of return review – Version 3*, February 2024, p. 35.

naturally have different efficiently incurred costs of debt. This means the ten benchmark yields in the trailing average should be different for each regulated entity.

- The differences are the outcome from applying the same benchmark debt strategy to regulated entities with different benchmark debt profiles. Therefore, calculating the allowed cost of debt using different weights for each regulated entity is not a departure from a benchmarking approach.

Would likely need to be implemented via a retrospective true-up, since weights can only be computed after the parameters they are based on have been observed

- Under QTC's approach, the weights are based on annual changes in forecast benchmark debt. Parameters that are subsequently observed are not used.
- There is no true-up to account for the over- or under-estimation of the total cost of debt allowance if there are ex-post differences between forecast and actual debt. This also applies under a simple trailing average.
- The only true-up relates to mismatches that occur if the allowed cost of debt is not updated annually. This also applies under a simple trailing average.

Not consistent with Australian regulatory practice

- In QTC's view, the most important requirement is for the cost of debt approach to produce the best estimate of the efficiently incurred cost of debt for a benchmark efficient firm. The approach should be capable of doing this regardless of whether forecast benchmark debt for the entity being regulated is relatively stable or increasing by large amounts over time.
 - It should not be assumed that the approach currently used by most other regulators meets this requirement.
- As we have argued in this submission, an approach that immediately compensates a new borrowing made today at a yield that prevailed in the past will not provide compensation for the efficiently incurred cost of debt, especially when changes in forecast benchmark debt are relatively large.
- The QCA and AER have acknowledged that when large increases in benchmark debt are expected, a simple trailing average creates a potential mismatch between the allowed and efficiently incurred cost of debt. A cost of debt approach that minimises these mismatches is important as it strengthens the incentives for efficient investment, which is fundamental to economic regulation²²:

‘The impact on the incentives for efficient capex is also an important consideration. The incentives for efficient capex are stronger when the difference between the return on debt and the debt servicing costs of the service provider is minimised.’

- QTC's weighted trailing average approach can achieve the above objective without creating additional complexity or requiring retrospective true-ups. The approach is less sensitive to differences between actual and forecast new borrowings compared to a simple trailing average. The weights are based on the same benchmark debt balances that determine the dollar value of the cost of debt allowance under a simple trailing average.
- The workbook that forms part of this submission demonstrates that the calculations underlying the simple and weighted trailing average approaches are the same. The only difference is the benchmark 10-year BBB yields that are used as inputs in the calculations. This shows that the difference between applying these cost of debt approaches is not as significant as some regulators have suggested.
- The large expected increases in GAWB's RAB in FY26–FY20 present the QCA with an opportunity to lead regulatory framework development and address a significant weakness in the simple trailing average cost of debt approach.

²² AEMC, *Final Rule Determination*, November 2012, p. 77.

Appendix B – The case for a weighted trailing average approach

Conceptual consistency

- The simple and weighted trailing average approaches replicate the cost produced by a portfolio of ten fixed-rate bonds with annual maturities from 1–10 years. The key difference between the approaches is how increases in benchmark debt (ie, new borrowings above the 10 per cent annual refinancing) are compensated:
 - Under a simple trailing average, the increases are compensated at historical 10-year BBB yields.
 - Under a weighted average approach, the increases are initially compensated at the prevailing 10-year BBB yield, with the compensation progressively moving to a 10-year trailing average over the next 10 years.
- A major conceptual inconsistency with a simple trailing average is that it applies a different cost of debt to two benchmark debt transactions that occur at the same time²³:

‘A simple trailing average is an inconsistent return on debt approach because it compensates two new borrowings that are made at the same time at different costs of debt. The annual refinancing of 10 per cent of the existing debt balance is compensated at the prevailing cost of debt, while the increase in the debt balance for the same year is compensated at the average cost of debt over the last 10 years.’

- A weighted trailing average does not suffer from this inconsistency because it initially compensates new borrowings at the prevailing 10-year BBB yield regardless of whether the borrowing is made to refinance maturing debt or to fund new investment.

Compensation for efficiently incurred debt financing costs

- Economic regulation seeks to provide compensation for efficient costs of a benchmark firm, including efficient debt financing costs. As QTC has previously argued, efficient debt financing costs are the cost outcome from an efficient debt management strategy²⁴:

An efficient debt management strategy results in a firm’s equity providers being exposed to an acceptable level of interest rate risk and refinancing risk taking into account the firm’s size, asset life, capital structure and the characteristics of its revenues. These considerations apply to all levered firms regardless of whether they are subject to economic regulation or price monitoring.

Compensating a regulated firm for efficiently incurred debt financing costs can be achieved by:

- > determining the characteristics of a prudent and efficient benchmark debt management strategy, and then
 - > making the best estimate of the benchmark costs that would be incurred to adopt and maintain this strategy over time.
- As explained previously, an essential part of the debt management strategy of a benchmark efficient firm is to issue debt to fund new investment. This debt can only be issued at prevailing yields, so it should be compensated on the same basis. This is what happens under QTC’s weighted trailing average approach.
 - In contrast, the debt management strategy underlying a simple trailing average (ie, issuing new debt today at yields that prevailed in the past) is impossible to implement in practice, so it will not provide compensation for the efficiently incurred cost of debt when large new investments are made.

²³ QTC, *PTRM-weighted trailing average approach. A Joint Report for Energex and Ergon Energy*, June 2015, p 3. As part of Energex revised regulatory proposal – Jul 2015, Appendix 7.8.

²⁴ QTC, *Trailing average cost of debt draft decision*, 2014, p.6.

Provides correct investment incentives

- When funding large new investments, a cost of debt approach that minimises the difference between the allowed and efficiently incurred cost of debt will strengthen the incentives for efficient investment²⁵:

‘... the incentives for efficient capex are stronger when the difference between the return on debt and the debt servicing costs of the service provider is minimised.’

- Differences between the allowed and prevailing cost of debt under a simple trailing average approach will naturally occur over time. As noted by ERAWA, these differences can lead to investment distortions²⁶:

‘Under a simple trailing average, the marginal return on debt applying to a new investment is not the prevailing rate, but rather the trailing average estimate of the return on debt that is incorporated in tariffs.’

...to the extent that the prevailing rate exceeds the trailing average cost of debt allowance incorporated in the tariff that applies to a new investment, then there will be an incentive to delay the forecast investment, so as to avoid making a loss on that investment. This is a clear distortion in investment incentives.’

- The marginal cost of debt applying to a new investment under a weighted trailing average is the prevailing cost of debt. This ensures consistency between the allowed and efficiently incurred cost of debt of a benchmark efficient firm, which provides the correct incentive for efficient investment.
- In the scenario considered by ERAWA, there is no incentive to delay a forecast investment under a weighted trailing average approach. Similarly, a firm will not receive a windfall gain at the expense of customers if the prevailing cost of debt is below the trailing average.
- In addition to providing correct investment incentives, compensating new borrowings at the prevailing cost of debt also promotes allocative efficiency²⁷:

‘Allocative efficiency can be achieved by setting the allowed return on debt such that it reflects the lowest debt financing cost that a benchmark efficient entity could realistically achieve.’

- An allowed cost of debt that compensates new borrowings at the prevailing cost of debt will promote allocative efficiency because it is a cost that can be realistically achieved (ie, incurred) by a benchmark efficient firm that implements an efficient benchmark debt strategy.

²⁵ AEMC, *Final Rule Determination*, November 2012, p.77.

²⁶ ERAWA, *Final Decision on Proposed Revisions to the Access Arrangement for the Mid-West and South-West Gas Distributions Systems*, November 2019, p. 302.

²⁷ AER, *Better Regulation Explanatory statement - Draft rate of return guideline*, August 2013, p. 77.

Appendix C – Producing daily 10-year BBB estimates

- The RBA produces month-end BBB yield estimates. If daily estimates of the extrapolated 10-year BBB yield are required, these can be made by using linear interpolation of the 10-year DRP between two month-end observations, and adding the interpolated DRPs to the corresponding daily 10-year CGS yields²⁸.
- Table 4 shows how daily 10-year BBB yields can be estimated using December 2023 as an example²⁹:

TABLE 4: DAILY EXTRAPOLATED 10-YEAR BBB ESTIMATES FOR DECEMBER 2023

Date	10-year CGS yield (%)	Interpolated 10-year BBB DRP (%)	Daily 10-year BBB yield (%)
30 Nov 2023	4.4586	2.4214	6.8800
1 Dec 2023	4.5404	2.4009	6.9413
4 Dec 2023	4.4944	2.3804	6.8748
5 Dec 2023	4.4586	2.3599	6.8185
6 Dec 2023	4.3258	2.3394	6.6652
7 Dec 2023	4.3820	2.3189	6.7009
8 Dec 2023	4.3411	2.2984	6.6395
11 Dec 2023	4.3871	2.2779	6.6650
12 Dec 2023	4.3718	2.2574	6.6292
13 Dec 2023	4.3309	2.2369	6.5678
14 Dec 2023	4.1675	2.2164	6.3839
15 Dec 2023	4.1828	2.1959	6.3787
18 Dec 2023	4.0961	2.1754	6.2715
19 Dec 2023	4.1522	2.1549	6.3071
20 Dec 2023	4.0879	2.1344	6.2223
21 Dec 2023	4.0584	2.1139	6.1723
22 Dec 2023	4.0471	2.0934	6.1405
27 Dec 2023	4.0125	2.0729	6.0854
28 Dec 2023	3.9309	2.0524	5.9833
29 Dec 2023	3.9972	2.0328	6.0300

Source: RBA, QTC calculations.

²⁸ The month-end 10-year DRP equals the 10-year BBB yield using total yield extrapolation approach minus the 10-year CGS yield.

²⁹ There are 19 business days in December 2023. Based on the month-end DRPs of 2.4214 per cent and 2.0328 per cent, the daily change in the DRP using linear interpolation is -0.0205 per cent.