

QCA Investigation of GAWB's Pricing Practices
GAWB Submission in response to the QCA's Draft Report

Gladstone Area Water Board
(GAWB)

Queensland Competition Authority's (QCA)
Investigation of GAWB's Pricing Practices

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INTRODUCTION

We are pleased to provide our response to the QCA's draft report.

Whilst we agree with much of the report and the draft recommendations we either disagree or have concerns with a number of positions reached by the QCA.

GAWB is concerned with the overall nature of a pricing practices investigation which incorporates a directive to provide indicative maximum prices to GAWB's customers but not to GAWB. These draft and final indicative maximum prices effectively become de facto tariffs.

Under arrangements as they stand GAWB cannot judge whether these prices reflect a correct application of recommended pricing practices underpinned by sound data and assumptions due to the lack of transparency surrounding how these prices are calculated. GAWB does not have access to the QCA pricing model, the data and the specific assumptions which underpin the prices.

Whilst access to the QCA's consultant reports is welcome, there is still insufficient information contained therein to enable GAWB to either assess the indicative prices or develop a pricing model which would generate equivalent prices for comparison. The linkage between the model's data and the information contained in the consultant reports is not demonstrated.

The following matters represent areas where GAWB has a difference of opinion in regard to the way in which the QCA has approached particular issues. These are issues of principle:

- The price cap form of regulation;
- Calculation of Excess Volume Charges & Excess Instantaneous Flow Charges;
- Rate of return; and
- QCA involvement in monitoring and disputation.

GAWB also has specific concerns with:

- Price smoothing methodology and application to the last regulatory period;
- Treatment of working capital.
- Calculation of the risk free rate.

As you know GAWB has flagged that it has concerns with the findings of certain QCA consultant reports. Given that GAWB received the last of these reports on 7 February 2005 it will not be possible to address all data verification matters by the closing date for submissions. GAWB appreciates that the QCA has reactivated certain consultancies in the interests of improving the data set. We will cooperate to the fullest extent to ensure that your consultants are able to fulfil their terms of reference.

REGULATORY FRAMEWORK

Regulatory Process

We have several concerns about the current regulatory process.

Pricing Model

The QCA noted (p127) that its current role is narrowly defined:

The Authority has received submissions that the Authority should establish reference tariffs and provide price floors and caps to guide future contractual negotiations. This is a matter for Government. Under the QCA Act, the Authority is only able to investigate pricing practices.

However, the QCA is also required to “advise, on a confidential basis, individual customers of indicative prices consistent with the Authority’s recommended pricing practices”. Whilst we understand that under the direction the QCA is bound to produce and disseminate indicative maximum prices, the approach to doing so has, both in this review and the previous review, caused substantial problems.

Whilst, as the QCA have pointed out in correspondence to concerned customers, GAWB is not required to charge the maximum prices calculated by the QCA, the indicative prices become, in effect, de facto tariffs. The prices are, in effect, both maximums and minimums under the QCA’s preferred price cap methodology.

The QCA accepts the principle and requirement under the Water Act 2000, for GAWB to act commercially and to be commercially successful. To meet this objective, GAWB must earn commercial returns on its investment. The investigation expends considerable effort in calculating what would constitute commercial returns and the revenue required to be generated to provide such returns. The required revenue is then used to generate specific segment prices. These become the indicative maximum prices. Therefore, the achievement of appropriate commercial returns by GAWB is predicated on the application of the maximum prices. The achievement of such returns underpins GAWB’s viability and its ability to achieve the desired balance of outcomes including water sufficiency and quality over the long term.

GAWB is bound to apply the Ministerially endorsed recommended pricing practices and principles. In practice, GAWB must act reasonably with due regard to equity between its customers. Therefore GAWB cannot develop individual prices on an ad hoc or subjective basis. It must develop and apply prices based on an objective application of clearly articulated principles.

GAWB's commercial view is that decisions to not charge the QCA calculated indicative maximum prices will be based on either:

- A GAWB belief that the QCA has not applied the pricing principles accurately to a particular set of facts; or
- A demonstrated and genuine commercial reason not to charge the full price (because, for example, it has been demonstrated that a viable by-pass solution exists that would render the relevant assets redundant).

Other price differences between customers using identical storage and delivery infrastructure would reflect either:

- the outcomes of negotiations with customers around their specific risk and or non-standard service levels; or
- that the indicative prices had not yet incorporated all appropriate matters, for example, the impact of future drought induced water restrictions.

For the 2002 investigation, GAWB was not given access to the QCA's pricing model or detailed modelling data. The QCA has indicated that it intends to follow the same practice for the current investigation.

GAWB has access to investigation outcomes at only the most aggregate level. Indeed, the QCA was unable to even release the indicative maximum prices to GAWB without a direction from Government. Without that direction, GAWB faced the extraordinary situation of being subject to effective price cap regulation without any knowledge of the level of the purported price caps.

Even with a schedule of QCA determined prices, any attempt by GAWB to check the QCA calculations is extremely difficult. Clearly the outcome of the QCA and GAWB attempting to run parallel pricing models is highly inefficient. These models will each contain differences in interpretation of the QCA recommendations and inevitable differences in understanding the data and circumstances subject to modelling assumptions. In attempting to calibrate our model against the QCA outputs we have an onerous task: it is not possible to infer the myriad modelling decisions from the level of detail included in regulators' reports. GAWB has very little idea whether differences between modelled prices arise from differences in methodology, interpretation, GAWB errors or QCA errors.

Differences between prices calculated by the QCA and prices calculated by GAWB could be the result of any number of variables, including differences in:

- the timing and location of the capital expenditure programme (the QCA releases aggregate new capital expenditure over 20 years. Replacement capital expenditure is included in the model.);
- the volume forecast by segment (the QCA only releases aggregate volumes in each year);

- the differences in assumptions related to the risk preferences of customers; and
- the treatment of capital contributions (the QCA does not release any information related to its assumptions concerning the treatment of specific capital contributions nor does GAWB have access to the information provided by customers to the QCA in this regard.)

We believe this outcome is:

- very inefficient;
- highly unusual from a regulatory perspective; and
- not justified by confidentiality or other commercial restrictions.

One possible solution to this problem is for the QCA to release the results of its decisions in a form that allows all parties to replicate the prices calculated.

We are happy to talk with the QCA about the requisite level of detail required (20 year volume and instantaneous volume forecast by delivery point, asset value and remaining life by segment, 20 year capital expenditure programme by segment, etc.)

A far more sensible approach would be for the QCA to make available its pricing model to GAWB (and indeed its customers).

Joint Modelling

In future the QCA and GAWB should jointly model prices. This approach is used in many other jurisdictions.

In its recent electricity price review in Tasmania, the regulator set up a combined modelling team headed by an officer from OTTER to ensure that both parties had access to all information with no duplication of effort.

For electricity and gas price reviews in NSW and Victoria, jurisdictional regulators develop generic Excel models which are populated by each of the DNSPs.

The models used are perhaps somewhat simpler than the full pricing model developed by the QCA for GAWB (because of the lack of zones and the fact that the weighted average price is controlled rather than each individual price). However, this approach allows both parties to review both model operation and data accuracy.

Public Release of Indicative Maximum Prices

GAWB is concerned about the release of 'indicative maximum prices' to customers without any reference to GAWB or its pricing methodology. The recent adverse publicity around Mt Larcom Township's pricing and the extreme concern caused to its residents provides a stark example of the pitfalls of such an approach.

GAWB believes that much of the concern was unnecessarily caused by the lack of transparency relating to the application of QCA principles to the specific facts and circumstances surrounding this supply. This could have been avoided had more work been done jointly with GAWB.

Specific Facts Relating to the Mt Larcom Supply

The relevant GAWB pipeline and reservoir was built for the specific purpose of supplying raw water to Cement Australia's (CA) East End mine so that limestone and other extracted material could be slurried back to CA's Fishermans Landing plant using an adjacent pipeline owned by CA. A pipeline was also constructed from the reservoir to Willmott Lagoon to service Mount Larcom Township.

In 1997 slurring was discontinued and both GAWB's and Calliope Shire Council's (CSC) delivery systems were subsequently reconfigured so that the pipeline could meet a small demand for potable water at CSC's Mount Larcom Township.

We understand that the QCA considers this asset to have been contributed by CA. In that event we understand that only CA can receive any price benefits relating to the capital contributed.

The assets were redeployed on an opportunistic basis in order to generate some additional value and provide an otherwise prohibitively expensive water supply to a small community. GAWB believes that the pipeline and reservoir should have been optimised and a bypass price established, notwithstanding, that future industrial demand in the Aldoga section of the pipeline has not been established. The pipeline can always be re-optimised if demand emerges.

In these circumstances GAWB's pricing methodology recognises that the maximum price for Mt Larcom Township should be based on the economic value of the water with particular regard to the cheapest alternative supply. This is the maximum possible price that could be charged. Given minimal potable demand relative to the capacity of the pipeline, it appears likely that the economic value will be much less than a current DORC valuation.

The minimum price would be that price sufficient to:

- recover GAWB's short run marginal costs (mainly pumping, maintenance, treatment and other direct operating costs); and
- provide some return to GAWB for provision of the service.

Any such, even preliminary evaluation, will establish that the indicative maximum price is very much less than the maximum indicative price released to CSC.

One factor influencing the Mt Larcom Township price is the treatment and allocation of spare capacity. Simple pricing models divide the target revenue for an asset by the forecast throughput. This methodology has some well known disadvantages.

In particular, and in direct contrast to economically sensible pricing, prices are highest where the amount of spare capacity is greatest and lowest where congestion may be driving system augmentation. A review of a similar methodology used to develop transmission pricing in the National Electricity Market concluded that all assets should be assigned an average utilisation for the purposes of developing tariffs.

Again, because GAWB has no access to the QCA's model, we have no way of knowing what methodology the QCA used to price pipelines with high and low spare capacity.

Published Prices

The current Ministerial directive requires the QCA to '*advise, on a confidential basis, individual customers of indicative prices consistent with the Authority's recommended pricing practices*'. We believe that, in future, the QCA should publish its calculated prices (excluding the effects of any confidential capital contributions or other non-standard arrangements), but only following consultation and joint modelling with GAWB. The effects of any non-standard arrangements could still be provided to customers on a confidential basis. This arrangement would:

- help ensure prices are error-free;
- improve information available to prospective new customers and third-party capacity providers;
- facilitate informed debate as to the merits of location specific pricing, segmentation, and optimisation decisions, etc.; and
- generally improve regime transparency.

Form of Regulation

The QCA proposes to retain a price cap regulatory regime for GAWB.

GAWB continues to believe that a revenue cap with price side constraints would be a superior form of regulation at this point in the development of the regulatory framework.

We will not restate our full argument here. We believe that a revenue cap regime would provide GAWB with a level of investment certainty more commensurate with its risk. At the same time it would provide a regime which better supports both GAWB and its customers pursuing effective management of the scarce water resource. We would also add that we believe the task of setting price caps, independent of the contract negotiation process, is fraught with difficulty.

Under a price cap, the QCA must estimate the volumes in each tariff category. In GAWB's case, this involves estimating not only customers' annual and instantaneous demand, but also understanding something of the distribution of possible outcomes around the expected demand and each customer's attitude to risk (and therefore estimating where the customer will set its contract capacity relative to its expected demand). This is not particularly onerous where there is a consumption / contracting history based on a stable tariff structure. However, where a new regime is being developed (as is the case here) or where new tariff components are introduced (for example, the Instantaneous Volume Charge), this task is not trivial.

Also, as previously submitted, we believe a revenue cap is much better suited to handling drought.

PRICING FRAMEWORK

Separate Two-Part Tariffs for Delivery and Storage

GAWB is pleased to note that the QCA supports its proposal of a separate two-part tariff for each of the storage and delivery components.

The QCA stated that delivery asset pricing based on instantaneous flow '*would be consistent with cost reflectivity*' (p38) but did not specifically propose such a charge basis in its recommendations at the end of Section 4.3. We seek clarification that the QCA supports GAWB's move to delivery prices based on customer nominated peak instantaneous demands.

Price Path

Whilst we recognise that customers may prefer to see declining real tariffs, this would involve higher tariffs in the short term. Therefore we support the QCA's proposed constant real price path.

GAWB supports AIC as a proxy for the LRMC used to set the variable component of tariffs. GAWB also supports the proposal for fixing components for the full five year regulatory period save for CPI indexation. A more dynamic process may be useful in future regulatory periods when capacity augmentation is closer.

Calculation of Excess Volume Charge and Excess Instantaneous Flow Charge

Whilst we are pleased to see that the QCA broadly endorses GAWB's views regarding the proposed over-run components of the tariff regime, we do not agree with the specific charge calculation regime proposed by the QCA. The intent of the regime is to ensure that appropriate costs for poor demand forecasting come back to customers to encourage them to focus on these issues. Customers can make informed investment choices between, say, paying excess volume charges or investing in on-site storage to minimise peak flows, with the full certainty of knowing what impact it will have on GAWB's charges.

We do not completely understand the QCA's proposed structure. Our interpretation of the QCA-proposed regime for excess volume¹ is:

- for demand less than 110% of the contracted quantity, no excess volume charge is payable;
- for demand between 110% and 125% of the contract quantity, an excess volume charge of 25% of the access charge is payable; and
- for demand in excess of 150% of the contracted quantity, an excess volume charge of 50% of the access charge is payable.

We believe that the incentive created by the over-run charges proposed by the QCA would be so marginal in nature that they will have no effect. Indeed they may have a perverse effect (creating an incentive to nominate contract quantities lower than expected consumption levels). In periods approaching an augmentation (when access charges are low) such a message becomes even more important.

The chart below shows that, using this definition of excess volume charges, a customer has the incentive to understate demand. Consider a customer with expected demand of 1,000ML, an access charge of \$100/ML and a volumetric charge of \$200/ML. If the customer specifies a contract volume of 1,000ML then the expected annual bill would be:

Charge Component	Calculation	Charge \$
Access Charges	1,000ML x \$100/ML	100,000
Volumetric Charges	1,000ML x \$200/ML	200,000
Excess Demand Charges		Nil
	Total Annual Bill	\$300,000

Table 1 – Hypothetical Bill Calculation (1,000ML Contract)

¹ For simplicity, for the remainder of this section we refer to the Excess Volume Charge and Excess Instantaneous Flow Charge as generically as 'excess volume charges'.

The chart below shows the cost and average price effects of excess consumption using the QCA regime.

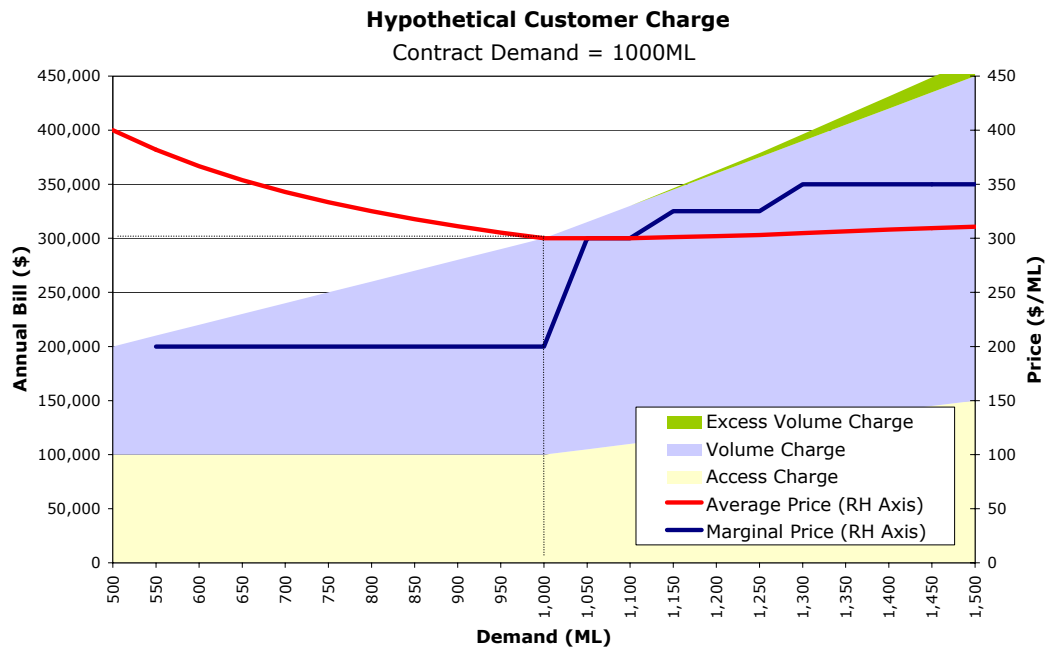


Figure 1 – QCA-Proposed Excess Volume Charge Characteristic (Modified Access Charge)

This approach has two significant drawbacks.

Firstly, note that the ‘green wedge’ of excess volume charge is very small compared to the total charge. This is also evident in the average price curve, which is only slightly inclining for volumes in excess of the contract level.

In our example, if the customer contracted for 1,000ML but consumed 1,500ML, the average price paid would increase from \$300/ML to around \$310/ML. That is, a 50% increase in demand would result in only a 3% increase in the average price.²

Secondly, linking the excess volume charge only to the access charge is counter-intuitive. In situations where capacity is scarce, the proportion of the total charge recovered by access charges will fall. As a consequence the incentive for customers to manage their consumption / demand to the contract parameters will also fall – just at the time that demand management is most valuable. This appears to be an unintended and perverse outcome of the QCA proposed definition.

² This result depends on the ratio of the access charge to the total charge. However, in the case of Awoonga Dam where access charges will make up around 90% of the total charge, a 50% volume over-run would result in only an 8% price increase.

In response, GAWB proposes that excess volume charges be calculated with reference to both the access and volume charges. We propose the following definitions:

- for demand less than 110% of the contracted volume, no excess volume charge is payable;
- for demand between 110% and 125% of the contract volume, an excess volume charge of 25% of the sum of the access charge and volume charge is payable; and
- for demand in excess of 150% of the contracted volume, an excess volume charge of 50% of sum of the access charge and volume charge is payable.

This definition retains the QCA proposed graduated structure but provides a greater incentive to correctly forecast and manage consumption than that proposed by the QCA.

However, we do not believe these charges are punitive: a 50% demand over-run would result in a 10% average price increase. Moreover the incentive will not change as an inverse function of capacity scarcity.

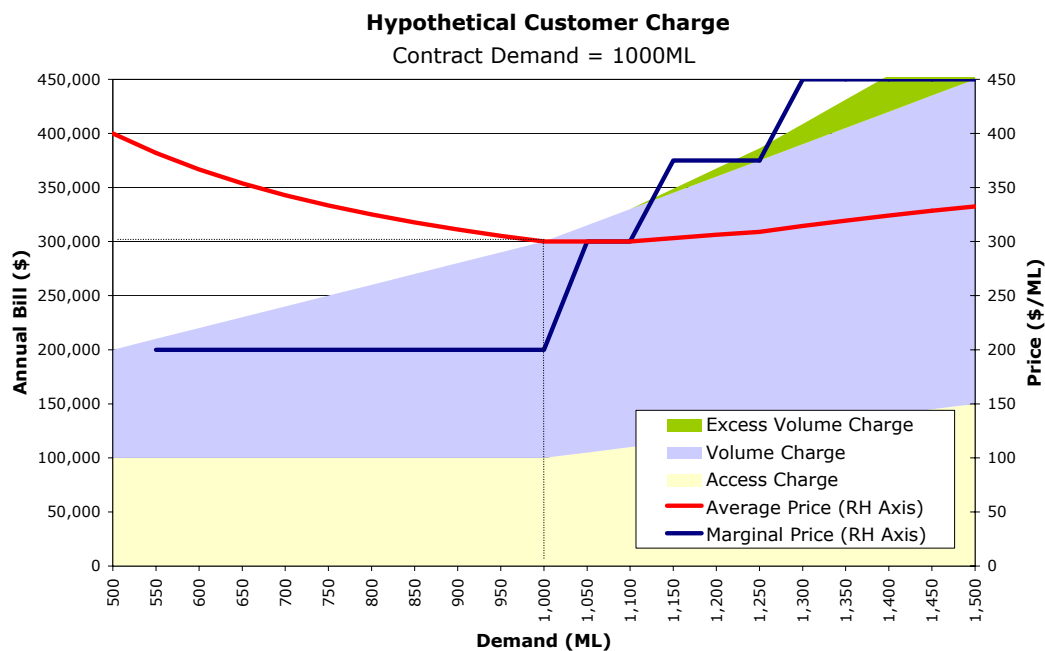


Figure 2 - Proposed Excess Volume Charge Characteristic

Volume Over-Run	Average Price Change
10%	Nil
20%	2.0%
40%	7.4%
60%	11.7%

Table 2 - Relationship between Over-Run and Price

An analysis of Councils' demands over the past 7 years indicates that volumes do not typically vary from historical trends by more than 30%. In most years (excluding drought) a simple two-year rolling average of historic demand predicts the current year's demand to an accuracy of $\pm 10\%$.

At a 10% over-run of the contracted volume, a Council's average price would be unchanged. At a 30% over-run a Council's average price increase would be less than 4.6%.

GAWB's customers experience varying degrees of difficulty in estimating forward demand. We do not accept that a customer with a more volatile consumption pattern should be excused from Excess Volume Charges and Excess Instantaneous Flow Charges. Therefore, while acknowledging that weather is an unpredictable factor influencing domestic consumption, GAWB submits that councils should be priced on the same basis as other customers.

Finally, for the purposes of clarity, GAWB makes the following points about the over-run component of our proposed contract regime:

- GAWB is not obliged to supply water in excess of the annual quantity specified in the Water Contract or at a rate exceeding the maximum flow rate set out in the Delivery Contract;
- GAWB may at its sole discretion, waive or reduce Excess Volume Charges and Excess Instantaneous Flow Charges in exceptional circumstances or where there are no consequential costs incurred by GAWB (and especially where GAWB has prior notice of the over-run); and
- A customer taking supply in excess of its contract specifications is liable for any consequential costs incurred by GAWB.

Price Smoothing Methodology

GAWB is concerned that price signals generated utilising the QCA's recommended smoothing methodology will be too weak to influence customer behaviour so that water is consumed to its highest value use and new augmentation is deferred where that is the efficient outcome.

We argued that the use of a revenue cap with its 'unders and overs' account would allow the total price to increase as LRMC increased. In a pre-augmentation phase, the real price would increase, thereby providing a strong signal to the customer to manage water efficiently.

Under the recommended price structure, the real price (and its access and volumetric components) is held constant in each regulatory period. Further, in the long run, it is expected to remain fairly constant as planned augmentations are added into the smoothed price path up to 20 years ahead of the construction date.

We believe that, for most of GAWB's customers, water is a modest cost when compared to most other industrial inputs. For example, weighted average costs of the Alcoa World Alumina & Chemicals joint venture (AWAC) are around US\$165 per tonne of alumina³. It is clear, based on our knowledge of QAL's published output, that GAWB's water charges represent somewhere between 1% and 2% of the total production costs of an alumina refinery.

It is reasonable to expect that most customers are, in theory, insensitive to price change for this reason. However competitive markets ensure that they are efficient and therefore probably amenable to behavioural change in the face of multi-part tariffs with access and volumetric components changing in each regulatory period. Our concern is that the recommended approach may not be sufficient to produce meaningful demand management and capital deferral outcomes.

We intend to add major augmentations to the LRMC only when such augmentations are reasonably certain, that is, when the need for the augmentation has been established and the time for a definitive commitment is imminent. For example, if a major augmentation had a 6 year lead time, it would be added in, say, 7 years ahead of the construction date rather than up to 20 years ahead.

The consequential real price increase supplemented by an increasing volumetric component would have the effect of providing a strong signal to the customer to use the water efficiently.

Such milestone events will generate price increases. Consequently customers will periodically apply pressure to GAWB to justify its impending major investment decisions. This will provide a strong signal to GAWB to review all options, competitive threats, new technology solutions and other relevant matters before committing to any major augmentation.

If GAWB was an incremental business with steady and fairly predictable demand met by relatively small scale augmentations, then the generally accepted AIC method for estimating LRMC is appropriate. However, in GAWB's circumstances, with lumpy demand and large scale augmentations, there may be some benefit in slightly modifying the generally accepted practice.

From a customer perspective, it can be expected that customers require price certainty. However this does not necessarily translate that they require a flat real price. A number of customers have indicated to GAWB that they would prefer to work with a good forward knowledge of prices, but only pay for major augmentations as they occur or become highly certain.

To the extent that major augmentations aren't included in prices, then modelling of possible price impacts of such events can supplement the price signals. This could be incorporated into the regulatory process and or provided for contractually.

³ Source: Deutsche

RATE OF RETURN

WACC

Professor Robert Officer has undertaken a review of the rate of return allowed in the QCA's draft report for GAWB. That part of the review dealing with beta estimation methods reflects other work undertaken by Officer and Professor Stephen Gray. Due to time constraints Gray has not been able to review this section.

The following section is Officer's synopsis and conclusion. His detailed review is attached as Appendix A.

The QCA adopted the "Vanilla" definition of the WACC equation. This is the most appropriate model to use for investments with finite life asset. It is a superior equation to alternative models considered by the QCA. However, the model implies a "degearing" equation that was not used by the QCA. Instead the QCA adopted what they referred to as the "Conine" equation which is derived from a different WACC equation to the one used by the QCA. This logical error causes a downward bias in the implied equity beta (β_e) of the order of 30% (the effective company tax rate).

Accepting arguments advanced by ACG, the QCA reduced the gearing to 50% from the more conventional 60% "... on the basis that GAWB's circumstances impose additional constraints on capital structure compared to energy companies in other water business comparators."(QCA, page 98). This is inconsistent with the reduction in the asset beta ascribed by the QCA for GAWB, on the basis of same argument the asset beta should have been increased.

Statistical and empirical evidence supports an equity beta for GAWB of 1.0. The statistical evidence comes in the form of standard hypothesis testing principles. The empirical evidence supports GAWB having an equity beta approximating that of other infrastructure assets that supply industry, namely gas and electricity distributors. GAWB's output is influenced by significant industrial users in contrast to most water companies.

Adopting these principles and accepting the gearing level and the debt premium adopted by the QCA gives an estimated WACC of 9%. Alternatively, if the debt beta of 0.11 is adopted, the WACC is 8.7%, which implies an asset beta for GAWB of 0.56. The latter is the correct answer if the expected net cash flows are properly defined and estimated.

Risk Free Rate based on a 20 Day Average of 10 Year Bond Rate

GAWB must be given the opportunity to manage its interest rate exposure through the nomination of a prospective risk free rate.

We understand that an average of the 10 year bond yields on each of the 20 working days immediately prior to the 1 July 2005 price reset may be used to determine the risk free rate.

GAWB needs to know as soon as possible what method will be used so that it can develop its interest rate management strategy around the method, particularly, if the QCA final indicative prices are to be set around the date of its final report.

Price Differentiation between Councils

GAWB argued that price equalisation was a matter for the Councils and was best handled directly between the two Councils. However, the QCA has recommended pooled pricing for the two councils.

GAWB intends to contract separately with the Councils and this raises some issues particularly with GAWB's policies requiring it to price on a commercial cost reflective basis. Accordingly, we would like the QCA to consider and provide feedback on the following suggested course of action:

Existing Potable Water Infrastructure

- GAWB should continue to charge on a commercial cost reflective basis with the amount of price equalisation being explicitly calculated and reported to the councils.
- The industrial north price class (industrial customers located at Yarwun) should not be subject to price equalisation. This has been previously agreed by Council officers.
- For certainty, the current price benefit of capital subsidies should be, with Council approval, converted into GAWB liabilities which are specific to each Council.

Currently subsidy price benefits are returned volumetrically over the various remaining lives of the infrastructure. Future water contracts will require water to be reserved with access and volumetric tariffs applying. Price benefits could be fixed to either component going forward.

However, rather than considering either action, GAWB recommends that existing subsidy price benefits be converted to liabilities. This will provide certainty. It will also provide GAWB with the flexibility to pay them out ahead of time (if the terms suit both parties) or enable Council(s) to convert the payment stream into an immediate cash sum.

However, in order to arrive at this position, the parties will have to, in their negotiations, take a view on the expected life of the relevant infrastructure as well as changes in the pricing, tax and regulatory framework in the future. It may be that the tax implications do not make this approach worthwhile for the parties. Nevertheless, this is a commercial approach which should be considered.

New Potable Water Infrastructure

GAWB believes that the starting point for pricing should be a commercial cost reflective basis. If the principles to apply to the pricing of new potable water infrastructure are to be the same as those which apply to existing infrastructure then the QCA should provide an explicit recommendation in this regard.

GAWB's view is that capital subsidies should not be reflected in prices but instead passed through to Councils. However the methodology employed to determine the proportionate amounts of subsidy passed through to each Council should be consistent with the QCA approach taken to price pooling.

For example, if the potable water system is being priced as if one price class exists, then subsidies should perhaps be returned based on the relative volumes consumed by each Council. Under this scenario, the location of the new infrastructure and the proportion of expected new demand from each Council which has driven the addition of the new capacity will be irrelevant.

Conversely, if pooling does not apply, then perhaps the subsidy share would reflect the proportion of new demand from each Council which is driving the addition of the new capacity.

GAWB strongly supports a transparent, documented approach. This will enable all parties to better deal with the future and to avoid the legacy issues which have complicated matters and strained relationships in the past.

Adjustments for Capital Contributions and Contributed Assets

GAWB generally supports the proposed treatment of historic capital contributions. However, as discussed in the Regulatory Process section earlier, GAWB does not have access to the QCA's valuation and interpretation of each capital contribution, nor to the material submitted by affected customers. Therefore, we cannot comment on the appropriateness or otherwise of the QCA's specific decisions. Nor can we replicate the QCA's treatment for the purposes of calculating tariffs.

GAWB understands that the QCA has made a number of assumptions and conclusions regarding the nature of various historical contribution arrangements. It has characterised some of these as capital contributions. Whether a financial arrangement is or is not a capital contribution is a matter of fact to be determined primarily by the parties with regard to the definition provided by the QCA.

We understand that GAWB retains a return of capital on historical capital contributions not remitted to the customer. GAWB requests confirmation that this is in fact the case.

We note that in delivering the price benefit of future capital contributions, GAWB will be denied a return of and on the capital component.

At p13, the QCA stated that GAWB is proposing to require customers to make capital contributions and pay access reservation fees to cover GAWB for the risks involved with any expansion of infrastructure for expected new demand.

At this point, GAWB intends to limit the utilisation of customer capital contributions in the future. Capital contributions have historically been levied to overcome utilities' capital constraints rather than as a risk mitigation or demand forecast incentive tool. As a general principle we believe capital contributions complicate the regulatory regime, tariff calculation and GAWB's relationship with its customers. GAWB proposes to use other mechanisms (long term contracts, time specific and / or conditional bank guarantees, etc.) to manage risk particularly related to the provision of new capacity.

Pricing for Exceptional Circumstances including Drought

In general, GAWB supports the QCA's proposed treatment of exceptional circumstances and drought risk.

It is important to note that imposing supply restrictions is not symptomatic of 'fault' by GAWB, nor does it imply poor management by GAWB.

The system (or more precisely the standard surface water product offered by GAWB) may require that supply restrictions be imposed from time to time.

It would be possible to design a system (or sell products) that offer higher reliability, but that would mean higher prices. Customers see the benefit of lower prices under the restriction-management regime.

To maintain the system and attract rational investment, GAWB must be compensated for its costs over time. The QCA correctly recognises that a system that adequately compensates GAWB in most years but under-compensates it in drought years will under-compensate on average.

We have identified several issues that are relevant for the overall pricing regime.

Firstly, there are direct costs associated with sensible drought contingencies which are incurred whether or not drought occurs in a particular year. These costs should be included in GAWB's target revenue calculation. If this principle is accepted, we will work with the QCA and its consultants to determine the quantum of the direct costs which should be included in GAWB's MRR (see Fitzroy Option discussion later).

Secondly, there is the direct cost of implementing drought mitigation initiatives (as opposed to loss of revenue from restricted supply volumes) when necessary. These should be handled on an ex post basis (as contemplated by the QCA's general position on extraordinary circumstances). Price premiums which reflect the uncertainty associated with drought induced restrictions will inevitably lead to higher prices than this method in the long term.

Thirdly, we envisage that the imposition of formal restrictions should trigger a change to the pricing arrangements. We recognise that many of our customers experience severe financial pressure when water restrictions curtail their production activities. GAWB also expects revenue and profitability volatility during severe droughts.

GAWB may consider reducing the fixed level of access charges (normally set to 100%) to the minimum needed to maintain GAWB's financial viability (say, just sufficient to cover debt repayment and operational expenses). Minimisation of the unavoidable component of GAWB's charges will provide the greatest incentive for customers to reduce their consumption. At this stage, GAWB has no policy position in relation to this matter and will not make any decisions in this regard without prior consultation with customers, other stakeholders and the QCA.

Fourthly, GAWB should be compensated for revenue forgone as a result of imposing supply restrictions. The pricing methodology attempts to recover efficient costs over 20 years given the volume forecast. Under the proposed price cap regime with drought handling including occasional periods of supply restrictions, the relevant volume for pricing is not the pure volume demanded but rather the expected volume supplied. That is, for pricing purposes, the volume forecast may be reduced by the expected effect of restrictions.

An alternative approach would be to include in the cashflow the expected lost revenue associated with supply restrictions.

In all cases where an ex-ante estimate is required, prices must be adjusted upwards to reflect the uncertainty incorporated in these estimates.

A better alternative is recovery of revenue foregone through the imposition of restrictions on an ex-post basis. Given the uncertainty associated with the timing and severity of future droughts, this is GAWB's preferred approach.

While the adjustment to target revenues occurs in future regulatory investigations, the methodology for calculating revenue losses (including allowances for the time value of money) should be agreed as part of this investigation.

Finally, GAWB notes again that these issues would be much more simply handled under a revenue cap regime. The regime would be relatively insensitive to volume forecasts with the 'unders and overs' account automatically recovering the value of lost revenue over time.

ASSET BASE

Asset Valuation and Optimisation

GAWB supports the QCA's use of DORC and the use of a 'brownfields' approach to optimisation. Moreover, GAWB supports the QCA's position that a regulated business should normally be compensated for value loss when assets are optimised out of the regulated asset base.

There is a significant difference between the capital expenditure programme submitted by GAWB and the total capital spend allowed by the QCA on advice from its consultants. We understand that the QCA has initiated a review of its SMEC consultancy and that further discussion between GAWB and SMEC will likely occur after the 11 February 2005 deadline for submissions in response to the QCA's draft report. GAWB has had only a limited time to assess SMEC's valuation report with the final documents only being received on 7 February 2005. GAWB will require more time to assess the appropriateness of particular valuation and optimisation decisions.

We submit that the QCA should make valuation reports public.

Working Capital

The report appears to contain an inaccuracy in that it states at page 81 that GAWB has moved to a position '*where accounts receivable is less than accounts payable*'. This statement is correct if the values contained on the face of GAWB's published financials are utilised as illustrated in the table below.

	2002 \$'000	2003 \$'000	2004 \$'000
Current Receivables	3,397	2,613	5,810
Current Payables	20,176	4,470	5,833
	(16,779)	(1,857)	(23)

However, consideration needs to be given to the detail behind these values as both receivables and payables (depending upon the year) include significant values for capital subsidies and accrued capital works (such as the Awoonga Dam Raising).

The table below compares the value for trade debtors with trade creditors over the same 3 year period excluding these anomalies. It illustrates that debtors exceed creditors over this period.

	2002 \$'000	2003 \$'000	2004 \$'000
Trade Debtors	1,046	1,428	2,280
Trade Creditors	336	719	409
	710	709	1871

\$ Per ML Sold	\$13.85	\$17.48	\$43.56
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GAWB is happy to talk to the QCA (and your consultants) about these matters having regard for the fact that some commercial in confidence constraints apply.

Nevertheless, we have no evidence to suggest that there has been any material change in average days received and paid. Consequently GAWB's working capital requirement will be positive. This was confirmed by the QCA in its last pricing practices investigation. Accordingly, since GAWB's shareholder has to fund this asset, it will require a return on capital.

GAWB is at the beginning of the utilisation cycle with the next major source augmentation not included by the QCA in the 20 year planning period. The effect of the flat real price is that GAWB's rate of return will ramp up significantly over the planning period as excess capacity is taken up. The growth in revenue will exceed the growth in expenditure so that, if days receivable and payable remain constant, working capital will continue to grow. In other words, it won't settle at a steady state level.

Price and demand are the two basic drivers for the increase in the working capital requirement over the planning period:

- Growth in costs is not expected to exceed the CPI indexation rate which is applied to prices. Interest will be aligned with prices during each regulatory period. Infrastructure will be indexed at CPI (based on the current recommendation) thus depreciation won't grow faster. Efficient operating costs are unlikely to grow at a higher rate;
- GAWB is early into the utilisation cycle. We therefore expect material increases in volume as excess capacity is taken up during the planning period. The additional volume related revenue will not translate into a concomitant additional amount of expenditure. In other words, most of the additional revenue from new demand will be reflected in GAWB's bottom line.

In summary, GAWB's working capital will continue to be positive and it will increase substantially during the planning period. GAWB is happy to work with the QCA to derive an appropriate revenue requirement for pricing purposes.

RETURN OF CAPITAL

Strategic Asset Management Plan (SAMP)

The QCA said that:

- *“while the Authority considers a renewals annuity to be a suitable alternative to depreciation for longer life assets that are renewable rather than replaceable, its application is not possible as GAWB is yet to finalise its strategic asset management plan (SAMP); and*
- *“while the pricing implications of adopting a renewals annuity for relevant assets are not likely to be large for the next pricing period, they may become so over time, although the precise pricing implications cannot be calculated for GAWB in the absence of a SAMP.”*

GAWB does have a rigorously developed and applied SAMP in place. It has been approved by the Department of Natural Resources and Mines in accordance with the provisions of the Water Act 2000.

However given that most of GAWB’s asset base is relatively new and in good condition, and as suggested by the QCA that the pricing implications of adopting a renewals annuity are unlikely to be large, the development of a reliable renewals annuity has not been a high priority for GAWB. GAWB will continue to develop its systems with a view to adopting an appropriate renewals annuity in future.

Accelerated Depreciation

GAWB has not identified any assets that it believes are candidates for accelerated depreciation during the current regulatory period. However, it reserves the right to bring such matters to the attention of the QCA in future regulatory reviews.

OPERATING COSTS

GAWB received the final SMEC report on 7 February 2005 and is currently assessing its findings.

As indicated earlier, we appreciate the further opportunity to discuss the contents of the SMEC report, but of course we won’t be able to comment on the appropriateness of the findings in the timeframe allowed for submissions.

Even if we concur with the findings, we have no ability to check that the data has been properly incorporated in the QCA pricing model and that the model is correctly calculating prices in accordance with the recommended pricing practices.

GAWB believes that there may be a number of types of costs which are not included in the cashflow.

In our submission for the earlier issues paper, GAWB proposed that, if the QCA retained the price cap, it would obtain actuarial advice (in conjunction with the QCA if appropriate) to determine:

- which risks are insurable and should therefore be treated on an ex-ante basis (including, where appropriate, the value of self insurance premiums that should be included in GAWB's operating cashflows to compensate it for these non-systematic risks); and
- which risks are uninsurable and therefore should be treated on an ex-post basis.

GAWB requests a review of the following costs by the QCA and its consultants with a view to including an allowance for them in the cashflows:

- Insurance, including self insurance (for example, business interruption and catastrophe);
- New source investigation (unavoidable work to ready the Fitzroy option for a rapid implementation in the event of an Awoonga supply restriction due to drought)

These matters are addressed in further detail below.

Insurance

The QCA and other utility regulators have consistently argued that businesses facing high non-systematic risks should not be rewarded through a higher WACC. Instead, the effects of this higher total risk position should be recognised in the business's allowed cashflows.

One way to think about this is as 'insurance' for non-systematic or company specific risk events. Insurable risks such as those related to property fire and theft and public liability are insurable, and the QCA includes the insurance premiums paid to third parties in the allowed operating and maintenance expenditure.

Some of GAWB's risks are currently not insured. Generally, these risks are either:

- not insurable (such as those relating to dishonesty or wilful default); or
- do not demonstrate value to GAWB having regard to the cost (for example, business interruption insurance).

Uninsured risks include:

- business interruption and catastrophe insurance;
- the effect of drought (direct cost and loss of revenue); and
- the loss of large customer(s).

GAWB requests a QCA review of the appropriate level of insurance costs (including pseudo premiums for self-insurance) consistent with the price-cap regime proposed.

Fitzroy Option

We expect to release a further draft of GAWB's Drought Management Plan (DMP) for consultation with our customers and other interested parties in the next couple of months. The plan will incorporate the lessons learned during the last drought. It will require further revision when plans around the Fitzroy option are firmed up and customers have indicated their preferences for dealing with drought induced restrictions.

GAWB's Strategic Water Plan has been forwarded to you and we have discussed its findings with you. When all criteria are considered (reliability, price, scale, environmental and social impacts) a weir on the Fitzroy River is the least cost, best value new source option, particularly, as substantial expenditure on the Gladstone to Monto railway must be factored into a further raising of Awoonga Dam. It is therefore the most likely next supply source for the Gladstone region. It is also the best option for customers with a low appetite for supply failure.

A likely drought mitigation strategy will be to progress the Fitzroy River weir project to the point where it can be developed at short notice. This is a sensible option: triggering the Fitzroy river weir project merely brings forward the preferred next supply source.

Therefore, subject to consultation with our customers, GAWB will seek to do the following work during the current regulatory period:

- obtain all necessary resource consents including a water allocation from the Fitzroy River;
- purchase necessary land;
- survey pipeline routes;
- undertake detailed design work; and
- develop a project plan for expediting roll-out of the project if triggered by drought conditions in the Boyne River catchment.

If these measures are put in place, it will be possible to make supply from the Fitzroy River available within a relatively short period of triggering the project.

The likely cost of these measures will be material (mainly land purchase costs) during the 2005 to 2010 regulatory period. GAWB can separately provide detailed estimates of project costs by year to the QCA if required.

Because GAWB has yet to arrive at a consensus with customers over the desired price versus reliability trade off, we propose that the QCA adopts one of the following two options:

Firstly, the QCA could allow a certain amount per year for land purchases for each year of the regulatory period to progress the Fitzroy River weir project to the point where it can be developed at short notice. GAWB will undertake other work within the currently allowed administration budget. If, following subsequent consultation with customers, GAWB determines that a different drought mitigation strategy is appropriate, the QCA could optimise out any land purchases not considered prudent for a supply source expected to be developed in 20 years time.

Secondly, the QCA could delay its indicative price outcomes (or vary them) once the outcome of GAWB's consultation process is known.

Once triggered, construction of the Fitzroy River weir and pipeline would require substantial additional capital expenditure (depending on the configuration selected).

A drought event triggering an early development of the Fitzroy River project would constitute an extraordinary circumstance. Recovery of costs would be considered ex post by the QCA.

ONGOING REGULATORY ARRANGEMENTS

Review Triggers

The QCA proposes that a review should be triggered if there is, or there is expected to be, a sustained variation of 15% or more in GAWB's aggregate revenue.

GAWB requests a clarification of the duration that would constitute a sustained aggregate revenue variation of 15%.

Escalation Factor

GAWB agrees that the Brisbane All Groups Consumer Price Index should be used to index prices during the regulatory period.

However, GAWB has used the annual movement in the March quarter index for this purpose so that price changes taking effect on 1 July in each year can be calculated and communicated prior to the effective date.

GAWB does not believe that there will be any significant differences between use of March quarter and June quarter indices in the long run. GAWB intends to incorporate this provision in its contracts.

Pricing adjustments

The QCA did not accept GAWB's submission that a revenue cap was the appropriate form of regulation. Instead, the QCA proposes to retain the current price cap based on a 20 year cost of supply model. However, the QCA recognises that the proposed regime under-recovers revenue in the years immediately following a major augmentation then over-recovers as the relevant capacity is used up.

GAWB would be unwilling to invest, if later, it was unable to over-recover (really just a catch-up of past economic losses). To address this problem, the QCA (p125) proposes a loss carry-over mechanism.

To ensure appropriate incentives to invest are in place, the smoothed price in future regulatory periods should incorporate an adjustment to reflect the effects of price smoothing. This can be achieved, for example, in the future by a carry-over adjustment for any over or under provision of revenues which may be identified in the subsequent period.

This is not the same as the GAWB-proposed revenue cap 'unders and overs account'. The QCA proposal relates to planned under-recovery as the result of the price smoothing mechanism. The 'unders and overs' account relates to differences between recovered revenue and allowed revenue that result from volume forecast errors.

If the QCA adopts a price cap with price smoothing over a period longer than the regulatory period, then the proposed mechanism is sensible and is supported by GAWB.

However, it is unreasonable that planned under-recovery of revenue in the current regulatory period is ignored. This is essentially a value transfer from GAWB (and therefore government and the people of Queensland) to customers.

The present level of tariffs is irrelevant: the adjustment mechanism is not related to actual tariffs or revenue but to the planned under-recovery in the period which is inherent in the 20 year price-smoothing approach.

The decision to exclude the loss adjustment in the current period is not justified by economic or equity criteria. Moreover it is not consistent with the QCA's 2002 investigation report (QCA 2002 p117) which stated that:

As a general principle, any future review should take into account the basis used for the current pricing recommendations, so that GAWB is able to achieve a commercial return on its assets over the life of its assets.

The QCA has not proposed any reason why the general principle of inter-period consistency articulated in both its 2002 and 2004 investigation reports should not be applied to the current regulatory period.

GAWB has increased prices and amended contract arrangements to the fullest extent possible having regard for the fact that not all relevant matters required for a cohesive pricing, contractual and regulatory framework were addressed during the last investigation. We are hopeful that the outcomes of this investigation will enable GAWB to roll out standardised contracts, a trading regime and full cost pricing across its customer base.

GAWB submits that the present price investigation should include an adjustment based on the difference between the smoothed price revenue and the annual building block revenue requirement, with annual differences capitalised to the commencement of the next pricing period using the WACC applicable for the previous investigation.

Monitoring Pricing Practices

GAWB supports wider use of the QCA to resolve price related disputes and to issue decision clarifications where appropriate.

The QCA proposes to monitor the application of ministerially approved pricing practices by reviewing prices and arrangements in contracts prior to their completion.

Whilst the form of the proposed monitoring is not clear to GAWB, and more detail would be appreciated, GAWB is strongly opposed to the QCA taking on a monitoring role of individual contractual arrangements prior to contract finalisation. We believe that this would unnecessarily inject a third party into what the QCA has acknowledged are commercial negotiations. We cannot see how this can be achieved without causing considerable confusion and delay.

GAWB has a challenging task ahead of it to roll out through a series of negotiations new long term contracts to all its customers. It does not need the process to become any more complicated. All of GAWB's customers are sophisticated and significant entities. GAWB has no small "franchise" customers. The QCA has articulated a set of principles which, if accepted, must be reflected in GAWB's approach to pricing. GAWB's customers are capable of understanding these principles and satisfying themselves that GAWB is applying them. If the QCA obtains dispute resolution powers as recommended in its report, customers that are unhappy with GAWB's contracts or approach will be able to take this up with the QCA.

GAWB's view is that the proposed QCA review of contracts prior to their completion is inappropriate. We believe a far more productive and appropriate role is for the QCA to review GAWB's standardised contracts. Any decision to negotiate terms and conditions different from the standardised contracts is a commercial matter between the parties.

Monitoring Service Standards

The QCA proposes that GAWB should annually report on service quality against the standard adopted for determining maximum allowable prices. This standard is reflected in product descriptions provided in customer contractual arrangements.

As indicated in our previous submission, GAWB is committed to improving the transparency of the regulatory regime and its investment decisions.

GAWB has proposed in its previous submission to the QCA that it will publish an annual disclosure document which shall include:

- total and current spare water availability by source;
- total and current spare delivery capacity in major pipelines;
- requests for available water and delivery capacity in any queue (volume but not requesting party);
- 10 year demand forecast;
- proposed capital projects to meet forecast demand;
- 10 year regulated water availability price (volume, access and excess volume) forecast;
- 10 year regulated delivery price (volume, access and excess flow) forecast at representative nodes; and
- Water Contracts 'bought back' by GAWB in that year (including source, year and price).

GAWB is however, opposed to the QCA taking on any formal technical regulatory or standards monitoring role. Again, once service standards are articulated in contracts, GAWB's performance against those standards is primarily a commercial / contractual issue between the parties. The contracts will have breach of contract and dispute resolution mechanisms articulated.

The regulatory framework within which GAWB operates is already highly complex. GAWB's performance is overseen by its statutorily empowered technical regulator, the Department of Natural Resources and Mines. This oversight includes standards and reporting regimes for the management of the storage, monitoring and management of both raw and treated water quality, and management of monitoring regimes and performance.

By way of further explanation GAWB's management of the storage GAWB must comply with the conditions of its Resource Operations Plan (ROP) and Resource Operations Licence (ROL).

The Boyne River Basin Resource Operations Plan 2003 (ROP) applies to the water in watercourses, lakes or springs in the Boyne River Basin and Awoonga dam.

The ROP deals with, among other things:

- *a comprehensive environment monitoring program;*
- *restrictions on the volume of water available from Awoonga dam;*
- *releases from Awoonga dam for the environment and downstream users; and*
- *restrictions on taking water from the Boyne River upstream and downstream of and from Awoonga dam.*

GAWB must develop and operate the business in accordance with a comprehensive SAMP and TMP and report annually against the SAMP.

The SAMP or Strategic Asset Management Plan is required under the Water Act 2000 for ensuring continuity of supply. GAWB must prepare a strategic asset management plan for approval by the regulator.

The plan must address the registered services to which the plan applies, the infrastructure for providing the services, standards for appropriate levels of service, including customer service, and performance indicators for the service and an operation, maintenance and renewals strategy that demonstrates how each standard will be achieved.

The TMP or Total Management Plan is required so that GAWB is able to obtain capital subsidies.

GAWB must monitor and manage the dam in accordance with dam safety regulations. This includes on-going reporting.

GAWB must develop and operate in accordance with the provisions of a 5 year Corporate Plan and an annual Ministerially approved Performance Plan. This includes quarterly reporting against both performance indicators covering all aspects of the business as well as progress on the implementation of initiatives.

Potable water standards are provided through the Australian Drinking Water Guidelines. Performance against these guidelines is monitored by the Department of Natural Resources and Mines and the Department of Health.

The addition of other supervisory or performance oversight functions and the inevitable attendant reporting requirements would add cost, confusion and workload without justification and could well lead to the development of inconsistency in objectives.

APPENDIX A
QCA's Draft Report - Review of GAWB's Allowed Rate of Return
Professor Robert Officer (14/2/05)

Introduction

In April 2004 the QCA was instructed to investigate the pricing practices of the GAWB. The QCA had previously examined GAWB in 2002.

There are many aspects of the task facing the QCA in determining the appropriate prices and pricing practices of the GAWB. Included amongst those tasks is to determine an appropriate rate of return or cost of capital for the regulated asset base of the GAWB. We have been asked by GAWB to review the QCA's estimate of the appropriate rate of return and particularly the estimates of the parameters making up that rate of return or cost of capital.

The Cost of Capital

The QCA uses a weighted average cost of capital (WACC) for the estimate of the cost of capital appropriate to GAWB in the framework of the capital asset pricing model (CAPM). This approach is consistent with most of the regulatory decisions that have been made in Australia in recent years and is consistent with the previous approach adopted by the QCA when it reviewed GAWB in 2002.

The framework adopted by the QCA for the WACC is known as the “Vanilla” WACC. It is described as equation 1 below:

$$\text{WACC} = R_e \frac{S}{V} + R_d \frac{D}{V} \quad \dots (1)$$

Where:

R_e is the cost of equity capital

R_d is the cost of debt capital

S is the value of equity

D is the value of debt and

$S + D = V$ is the value of the asset base.

The Vanilla WACC has the advantage over other forms of after-tax definitions of WACC in that all the tax and tax adjustments are made to the cash flows. This means that there is greater accuracy in estimating the actual tax that is paid because it can be estimated period by period in the net cash flows, whereas other forms of after-tax WACC involve taking account of tax as a mean (geometric) for the life of the investment. In these cases, the estimate of the effective tax rate is difficult, if not impossible, to determine with any degree of accuracy. In addition, with finite life investments, where depreciation is tax deductible, the Vanilla WACC by including all the effects of tax in the net cash flows gives a more accurate estimate of the true WACC whereas with the other forms of after tax WACC the effect of depreciation causes a distortion in the accurate measurement of the WACC unless the tax estimate specifically takes it into account.

The most difficult parameter to estimate in the Vanilla WACC is the cost of equity capital. Because equity holders are residual claimants and, therefore, the expected or required return to equity is not a contractual rate it has to be estimated as an expected return.

There are a number of models that can be adopted but the most popular and the model that has been adopted by the QCA is the capital asset pricing model (CAPM). This model is defined below as equation 2:

$$\begin{aligned} E(R_e) &= R_f + \beta_e (E(R_m) - R_f) \quad \dots (2) \\ &= R_f + \beta_e \text{MRP} \end{aligned}$$

Where

$E(R_e)$ is the expected return to equity;
 R_f is the risk free rate, typically represented by the yield on a 10 year Government Security;
 β_e is the covariance risk of the equity, and
 $E(R_m)$ is the expected return on a market portfolio and
 $\text{MRP} = E(R_m) - R_f$ is the market risk premium.

One of the advantages of adopting the “Vanilla” WACC is that by defining the rates of return for debt and equity in the context of the CAPM the asset beta (β_a) becomes a simple weighted average of debt and equity betas, shown below:

$$\beta_a = \beta_e \frac{S}{V} + \beta_d \frac{D}{V} \quad \dots (3)$$

$$\therefore \beta_e = \beta_a + \frac{D}{S} (\beta_a - \beta_d)$$

Adopting equation (3) means that it is relatively easy to compare betas where the effect of gearing or leveraging is taken into account. The approach implies an adoption of the Modigliani Miller propositions relating to the value of the firm being unchanged by gearing – this is sometimes not recognised when this leveraging or de-leveraging effect is adopted and, in a practical sense, it is probably only valid insofar as the level of leveraging is not extreme.

The QCA Report contemplates using a framework suggested by Lally on the grounds that the model that they have adopted which they refer to as the Officer CAPM does not distinguish between capital gains and interest income in terms of taxation. This is wrong.

The CAPM and the Vanilla (Officer) WACC all operate on the basis of after company but before personal tax returns. The returns, whether the company has paid capital gains tax or income tax, is irrelevant insofar as they are after tax returns. The form of the returns are capital gains, i.e. price changes in the company's shares - the changes reflect the taxation that the company incurs, and dividends which are, of course, paid after company taxes.

The Brennan (1970) model that Lally advocates is an after personal tax model⁴. It is almost impossible to apply such a model with any accuracy because capital markets trade securities on an after company tax but typically before personal tax basis. There is little empirical evidence around which we could test CAPM or any of the other models on the basis of taking into account personal taxes.

The above was really an aside because the QCA has decided to use the Vanilla WACC and the CAPM framework, which is the strongest theoretical and empirical approach that is currently available. Let us now return to the parameter estimates of the QCA Draft Decision.

Value of Gamma

Gamma is the value of imputation tax credits contained in the franked dividends that are expected to be distributed to shareholders as part of the return to equity. The value of these tax credits or gamma reflects the ability of the shareholder to deduct the tax credits from personal tax liabilities. In effect, when a company pays company taxes it earns franking credits which, when distributed and if utilised by the shareholder, represent a collection of personal tax at a company level. Because the WACC and the CAPM are framed on an after but before personal tax basis, an adjustment has to be made for the franking credits which, as we have indicated, are effectively a withholding of personal tax at the company level.

⁴ Brealey and Myers (fifth edition) briefly discuss the Brennan model under their chapter on "The Dividend Controversy".

Effectively, the value of the franking credits reduce the company tax by the same amount i.e. if a company paid out all the tax credits that it earned and these credits were fully utilised by shareholders in the same tax year as a company tax was paid then we would effectively have a zero company tax rate.

However, credits are not distributed as they are earned and not all shareholders can utilise the credits. It is difficult to determine the value of tax credits because there is no overt market for credits and therefore their value must be estimated by indirect means. The most comprehensive (and the most recent) study is by Hathaway and Officer (2004)⁵ where the distribution of dividends from every listed company in Australia was examined. It is estimated that on average the value of the credits, as a proportion of company tax is about 35%. In effect, with a 30% company tax rate, the effective company tax is approximately $(30 \times 0.65 =) 19\frac{1}{2}\%$. This number is less than the 50% used by the QCA which was based on an older study conducted by Hathaway and Officer.

The argument for adopting a $\gamma=1.0$ by Lally and its apparent acceptance by the QCA as a generality is wrong. There are very few dividends issued where the franking credits are valued at one judging by the dividend drop off rate approach to estimating value in the Hathaway and Officer (2004) paper. Similarly, it would be very surprising if the value of the credits were zero as this would imply the marginal investor in Australia was an offshore investor.

⁵ **Hathaway and Officer (2004) ABSTRACT:** A large proportion (about 35%) of the tax that "masquerades" as company tax is actually personal tax collected (or withheld) at the company level. This means that the effective company tax in Australia is much closer to 19% than the statutory rate of 30%. The reason is the introduction of imputation tax in July 1987 which substantially reduced the previous double tax on company earnings; company tax followed by personal tax on dividends. Shareholders now pay personal tax on the gross of dividends and imputation tax credits (i.e. company tax) and obtain credit for the company tax paid. There are three milestones in the life of franking credits; they are created when company tax is paid, they are distributed along with dividends and they are redeemed when shareholders claim them against personal tax liabilities. Two issues thus arise; how many credits are issued (*access*) and how many of these distributed credits are redeemed (*utilisation*)? We find that the access factor is 71 % and about 50% of distributed credits are being redeemed. Overall, about 35% of company tax is actually pre-payment of personal tax. Over the period July 1987 to June 2002 (the latest ATO data available) about \$265 billion of company tax had been paid, creating \$265 billion of franking credits of which \$77 billion remained within FAB accounts giving rise to an Australian-wide average access factor of 71 % over these 19 years.

This is patently wrong for most listed companies but not necessarily large listed, particularly resource based large listed companies.

It is important to point out that in the Vanilla version of the WACC that the QCA have adopted, γ is taken into account in the cash flows in the same way as taxes are taken into account in the cash flows. They are not part of the WACC definition of cost of capital.

Risk Free Rate

The QCA use the yield on a ten year Commonwealth Government Security. “On the basis that it contains the most recent information on prices, balanced by a mechanism that removes short-term spikes, the Authority proposes to continue using a 20-day averaging period.” There is no theoretical justification for using a 20-day average. Changes in yields are not predictable, and therefore there is no basis on which to assume that any change in rates could result in only a short-term movement or a “spike”. Using an average dilutes the information contained in the most recent rate; it also makes it difficult for the entity that is being regulated to effectively hedge the rate. The issue, in terms of the overall effect on the cost of capital, is not of major significance – see earlier GAWB discussion of 20 day average method.

Debt Beta

QCA’s discussion of the debt beta and the reverse engineering of the key CAPM to arrive at debt beta is not controversial in our opinion. The arguments about attributing the entire debt premium to beta or taking some proportion of it only, is a valid argument except for the problem of deciding what proportion to attribute to systematic risk and what to attribute to idiosyncratic or liquidity risk. The estimate of the beta of debt that is used by the QCA of 0.11 is defensible and I have no further comment on the estimate.

Leveraging and the Leveraging Formula

The Vanilla WACC that has been adopted by the QCA implies a leveraging or de-leveraging formula consistent with Equation 3 above. It would be internally inconsistent to approach re-leveraging with what the QCA describes as the Conine formula. This formula is not consistent with the WACC equation chosen by the QCA. The Conine formula is derived from the following definition of WACC:

$$\text{WACC} = R_e \frac{S}{V} + R_d (1 - T_e) \frac{D}{V}$$

Adopting the QCA (Conine) formula for de-leveraging β_e will bias the β_e estimate downwards by $(1-T_e)$. A reduction in the value of the β_e estimate by the effect of the tax rate, i.e the β_e estimated under the QCA equation, will be something approximating 30% less than that estimated under Equation (3). This is a logical error in the QCA approach.

Capital Structure

The capital structure assumed by the QCA for GAWB is 50% debt and 50% equity. The gearing or leveraging differs from the conventional 60% debt for infrastructure "... on the basis that GAWB's circumstances impose additional constraints on capital structure compared to energy companies in other water business comparators." (QCA, page 98). The evidence for changing the capital structure is not strong but then again neither is the evidence for retaining a 60% debt level.

However, it is important to note the inference of the arguments put by Allens Consulting Group (ACG) which is the basis on which the QCA modifies the capital structure. What is implied is that the asset beta of water companies is greater than the asset beta of energy companies and other infrastructure assets insofar as the GAWB cannot sustain the same level of debt as these other companies and yet the QCA has adopted an asset beta for GAWB that is below the asset betas of the other companies, a logical inconsistency in the QCA draft decision.

Market Risk Premium

The QCA Draft Report adopts a market risk premium of 6%. This estimate is consistent with the MRP adopted by other regulators and is consistent with the empirical data on MRP's. We have no further comment on the estimate.

Asset and Equity Betas

The most controversial and in our opinion the least defensible estimates in the QCA Draft Report are the estimates of the asset and equity betas. The QCA estimated an equity beta of 0.64 and a corresponding asset beta of 0.40. There is only empirical support for equity betas since asset betas cannot be directly estimated from the capital market and, as a consequence, must be derived making assumptions about gearing and debt betas. Therefore, the real test is finding an appropriate equity beta (β_e) for the regulated entity. In the current matter not only is GAWB unlisted, but there is no listed Australian water company and, therefore, no direct comparator. Overseas countries have listed water companies but, not only do we have to take account of the typically different nature of these companies to GAWB, their market betas are not directly comparable because their market factors or index returns are different and often quite different.

The basis of the QCA estimates is a report prepared by ACG who, in part, relied on estimated equity betas for Australian energy companies of 0.73, US water companies of 0.86 and UK water companies of 0.17. In my opinion, none of these estimates are defensible in that none of the estimates provided by ACG would stand up to a standard statistical test associated with the CAPM model – see below for discussion on beta estimation.

The problems of relying on overseas β estimates has already been referred but in the current matter where there are no Australian listed water companies and no direct β estimates for water companies it is tempting to rely on overseas estimates. However, as indicated, it is very questionable how relevant such estimates are to an Australian market when the estimates even in the context of their home economy are often very unreliable.

For example, the ACG refers to UK estimates of equity β 's of 0.17 for water companies. Contrast this with the estimates provided by Cooper and Currie (1999)⁶ of the London Business School Risk Management Service (LBRMS) in the table below:

Table 9: LBSRMS FTSE Water Industry Beta
LBSRMS Issue FTSE Water Industry Beta

<i>Months</i>	<i>Year</i>	<i>Equity β's</i>
January-March	1999	0.72
October-December	1998	0.81
July-September	1998	0.95
April-June	1998	0.98
January-March	1998	1.03
October-December	1997	1.07
July-September	1997	0.91
April-June	1997	0.99
January-March	1997	1.01
October-December	1996	1.02
July-September	1996	1.01
April-June	1996	1.05
January-March	1996	0.97
October-December	1995	0.98
July-September	1995	0.89
April-June	1995	0.86
January-March	1995	0.85
October-December	1994	0.84
July-September	1994	0.8
April-June	1994	0.81

In the context of the table it is noteworthy the variability of the β 's over time. Of equal relevance is the estimates average of 0.93 which is very close to 1.0. On the basis of these numbers one could accept with little reservation a null hypothesis that the equity beta of the UK water companies is 1.0.

In an attempt to overcome these problems of estimating a β for GAWB, ACG relate the asset beta to GDP instead of a capital market return or the "market factor". There is a relationship between GDP and the market factor but it is typically a poor one with the market factor tending to lead GDP by some quarters.

⁶ Ian Cooper and David Currie (1999) "The Cost of Capital for the UK Water Sector", Regulation Initiative Discussion Paper Series Number 28, London Business School.

Inevitably, any comparison under such circumstances of a company's return with GDP to estimate an equity beta would cause a downward estimate in the beta because of the poor correlation between GDP and the market return. "Eyeballing" the relationship, as ACG do, does not overcome the problem.

In this context, it should be noted that the major customer for water is Queensland Alumina Limited. Alumina companies around the world typically have betas above 1.0. While there is not necessarily a relationship between the beta of a supplier of a factor of production to a company and that company's beta without other evidence, the client company's beta can be an indicia of the supplier's beta. ACG relate aluminium production to Australian GDP and then relate that to an estimate of GAWB's equity beta. This is drawing too "long a bow". In our opinion, this is no better than using the equity beta of alumina companies as a surrogate for the supplier, and as we readily admit, this type of estimate is weak. A better surrogate of the equity of water companies whose major customers are commercial and industrial users of water are electric and gas utilities. A stronger set of arguments can be made for the adoption of business comparators in these industries that do not involve the degree of stretching as the inference drawn from physical production in a major customer to GDP to beta. But even in this context of gas and electricity distributors the estimates of equity betas present significant measurement problems.

Beta Estimation Methods⁷
STEPHEN GRAY & R.R. OFFICER

Equity betas cannot be *observed* or *measured* — they must be *estimated*.

The standard method for estimating equity betas is an ordinary least squares (OLS) regression of stock returns on market returns. Most commercial data sources use four or five years of monthly stock returns and monthly returns on a broad stock market index portfolio. The slope coefficient from a standard OLS regression of stock returns on market returns is then used as an estimate of the equity beta.

As with any regression, the estimated coefficient is not a precise calculation, but simply an estimate. The standard statistical (and legitimate) interpretation of the estimated coefficient from any regression is that the true value of this parameter comes from a normal distribution, with mean equal to the parameter estimate and standard deviation equal to the standard error of the estimate. That is, the regression approach does not compute the true beta, it merely narrows it down to within some probabilistic range.

The width and range of this distribution depends on how precisely the coefficient can be estimated. It is the standard error of the regression estimate that measures the precision with which it has been estimated. Typically equity beta estimates, computed by regressing stock returns on market returns, have large standard errors. This means that they are imprecisely estimated and cannot be relied upon with any great confidence.

The imprecision in beta estimates has been noted by Australian regulators including the QCA⁸ who note that, “Australian regulators have expressed concern about the degree of statistical imprecision associated with available beta estimates for comparable Australian listed entities.”

⁷ This section of the paper reflects work that has been done by the authors in another context but is very relevant to the current matter; Professor Gray has not participated in the GAWB matter.

⁸ QCA Draft Determination Regulation of Electricity Distribution. December 2004. p. 99.

The QCA also notes that statistical estimation issues can cause bias as well as imprecision in beta estimates. The QCA notes⁹ that this “may have affected the measurement of betas over recent years, and that measures of beta using data from this period may underestimate the true value of beta, including the 0.71 equity beta adopted by the Authority in its 2001 Final Determination.” In fact, this equity beta estimate is substantially lower than that used in any other comparable Australian regulatory determination. The QCA now appears to have rejected such an estimate.

The imprecision of equity beta estimates has also long been recognized in the academic literature and in practice. For example, the Centre for Research in Finance (CRIF) at the Australian Graduate School of Management computes OLS betas as well as Scholes-Williams betas. The Scholes-Williams procedure provides a statistical correction for non-trading. This correction is designed to correct for the fact that a particular stock may trade more or less frequently than the average stock in the index. The AGSM-CRIF Explanatory Notes explain that, “OLS can only be used when the data used satisfies the assumptions which underlie the regression analysis. One assumption, which is of potential importance in the Australian environment, is that the company and index rates of return should be measured contemporaneously; that is, over exactly the same time intervals. Since we are using monthly data, this is equivalent to assuming that all stocks have a trade (establishing the current price) right at the end of each month. While this might be the state of affairs for BHP, it is not so for many of the companies listed by the ASX. In fact, some listed companies exhibit infrequent trading to the point where they do not trade even at regular monthly intervals.”

In fact, the problem is more severe than this--many of the stocks that are included in the index also trade infrequently. Therefore, even if we are trying to estimate the beta of a stock that is large and liquid and trades continuously, there is still a mismatch with the trading frequency of the index. The index likely contains stock prices from its smaller constituents. The CRIF Explanatory Notes also recognize this: “This thin trading phenomenon may introduce biases into the OLS estimates.

⁹ QCA Draft Determination Regulation of Electricity Distribution. December 2004. p 103.

A number of statistical methods exist for estimating beta in the presence of the thin trading phenomena. The CRIF betas are computed using a version of the method first suggested by Scholes and Williams (1977). This technique adjusts for thin trading inherent in both the stock *and* the market index”. However, we cannot simply rely on these Scholes-Williams betas for at least three reasons:

They tend to be estimated with even less precision than standard OLS betas (i.e., they are designed to correct for non-trading bias, not statistical imprecision);

The Scholes-Williams technique is only one of many statistical adjustments to OLS betas that have been proposed (see below); and

The Scholes-Williams technique often produces extreme results, at least relative to standard OLS betas, but there is no consistent relationship between the two. For example, in the recent CRIF report (March, 2004), the Scholes-Williams beta is no different from the OLS beta for Envestra, 30% higher for Alinta, and 8 times as large for AGL!

Another reputable data source, Bloomberg, provides a different statistical adjustment. The ESC (2000) had regard to this Bloomberg adjustment in its 2001-05 Electricity Distribution Price Determination (p. 273-279). They reported raw betas and Blume-adjusted betas, as provided by the Bloomberg service as follows: $\beta_{e\text{adjusted}} = 0.67 \times \beta_{e\text{raw}} + 0.33 \times 1$. They then recognized (p. 274-5) that, “there are a number of technical issues associated with estimating betas and using adjustments to increase the reliability of the resultant beta estimates”. The ESC concluded that, “the most appropriate means of addressing concerns about statistical reliability of beta estimates is to take account as much information as possible, rather than basing a proxy beta upon a single estimate (2000, p. 275). Consequently, the Office has considered adjusted (as well as raw) betas in the assessment of the rate of return for the electricity distribution businesses”¹⁰.

¹⁰ The ESC has since rejected this type of adjustment on conceptual rather than statistical grounds. See the Review of Gas Access Arrangements: Final Decision, October 2002; and section 4 in the current report.

Three substantial pieces of work that document other variations in the way that betas are estimated in the Australian context are the ACG's report for the ACCC (2002), the NERA (2002) response to this report and the research monograph by Brailsford, Faff and Oliver (1997). These sources document more than 20 alternative statistical approaches that have been proposed to estimate equity betas.

Clearly, there is no single consensus approach for estimating equity betas. The very existence of so many alternative approaches is evidence that none are satisfactory, accurate, or robust. This is perfectly consistent with the approach that has been adopted by the ESC, in their 2001-05 Electricity Price Determination, where the Office notes (p. 279) that, "the selection of a proxy beta requires a degree of judgment, particularly given the lack of a wide selection of comparable entities listed on the Australian Stock Exchange" and consequently concludes (p. 283) that, "the Office is reluctant to determine a proxy beta below the range adopted in recent Australian regulatory decisions given the limits on the capital market data available (in turn due to the absence of a deep pool of comparable entities on the ASX).

In addition, the ACCC has recently addressed this issue in its Victorian Transmission Revenue decision. After consideration of the presently low values of the estimates of betas for comparable firms, the ACCC noted the statistical unreliability of these estimates and the range of statistical approaches that might be used to estimate equity betas and assessed that an appropriate estimate of the equity beta for electricity transmission is one.

In our view, there is no "convincing market data" that leads to the conclusion that an appropriate estimate of the equity beta is less than the estimate of one that has been used recently by the ACCC and other Australian regulators for infrastructure assets, in particular, electricity distribution which is likely to face similar risks as a company providing water for commercial use.

We note that our conclusion is exactly consistent with that of the Allen Consulting Group (ACG) in a recent report to the QCA¹¹. In that report (p. ix) ACG conclude as follows: “The Allen Consulting Group considers that the empirical evidence, together with the desirability of maintaining stability in regulatory decisions across time and consistency in regulatory decisions across companies justifies the use of an equity beta of 1.00 (for a gearing level of 60%) for the average regulated electricity distributor.” We believe that the same argument could/should have been used in their submission in maintaining consistency with the previous QCA decision on GAWB with equal veracity.

The Null Hypothesis and Regulatory Incentives

By construction, the equity beta of the average Australian firm is 1.0. This is equivalent to noting that the average Australian firm is expected to require a return on equity that matches that of the market portfolio. Thus, an equity beta of 1.0 is, by construction, the starting point or null hypothesis when estimating the beta for a particular firm. Only when there is sufficient evidence to depart from this null hypothesis should a different value be used. Indeed, in the financial economics literature it is quite standard to construct “market adjusted returns” by assuming that *all* firms have an equity beta of 1.0. Brown and Warner (1980) demonstrate that, in many settings, assuming the equity beta of all firms is 1.0 produces more consistent and reliable results than if betas are statistically estimated for each firm. Conceptually, a particular firm may have a beta different from 1.0 if the business in which it operates has low systematic risk or if it has different gearing than the average firm. However, these effects are difficult to quantify precisely such that a maintained assumption that equity beta equals 1.0 is often superior. This is particularly true in cases where the two effects work in opposite directions. For example, regulated energy distribution firms are likely to have lower than average systematic risk but much higher than average (assumed) gearing. To the extent that these effects are difficult to quantify and tend to cancel each other, substantial evidence should be required before departing from an equity beta of 1.0.

¹¹ The Allen Consulting Group: Queensland Distribution Network Service Providers - Cost of Capital Study. December 2004 Report to Queensland Competition Authority.

Moreover, it is inappropriate to suggest that a water distribution business must have an equity beta below 1.0 even if it believed that this type of business has below-average risk because this ignores the offsetting effect of high gearing. Once again this issue has been recently been addressed by the ACG (2004, p. 51) who note that “It must be recalled that, by definition, the average firm listed on the market has an equity beta of 1.00. However, the average firm is geared to 30%, rather than the 60% assumed for the DNSPs [distribution network service providers]. If the average firm in the market were geared to 60% it would have an equity beta of 1.60, which is the beta that can be legitimately compared with the beta that is estimated for the DNSPs.” Implicitly, ACG recognise the “trade-off” between gearing and equity risk, which suggests companies might adopt an average equity risk and then adjust the gearing that can sustain that level of risk. ACG has apparently ignored this in their GAWB submission when recommending an asset beta of 0.4 for GAWB below other infrastructure companies and a below average gearing of 50% instead of the more customary (in the previous decision and for other infrastructure assets) 60% debt. The lower level of gearing would suggest a higher asset beta rather than a lower beta.

In addition, in a regulatory setting the standard of evidence required to adopt an equity beta below 1.0 should be higher than the standard required to adopt a value above 1.0. This is based on the asymmetry in the consequences of erring on the calculation of required returns. If the entity fails to earn a return that is at least equal to its cost of funds (because equity beta is underestimated), there are implications for the ongoing viability of the entity and for future investment. These consequences can be severe, given that it is essential basic infrastructure businesses that are regulated. This regulatory risk must be balanced against the prices paid by consumers. There is a trade-off between price on the one hand and service and guaranteed supply on the other. The Productivity Commission is of the view that ensuring the ongoing viability of the business and creating the right incentives for future investment is more important than keeping prices to a minimum.

Moreover, there are relatively long lead times for investment in water distribution infrastructure. This reinforces the argument against underestimating betas and the required return of the regulated distribution business.

If the regulatory WACC is set too low, there is a significant chance that the firm will be unable to recover its cost of funds. In practice, firms invest only when there is a relatively high probability of the investment earning a return that exceeds the cost of funds. Thus, a low regulatory WACC provides a disincentive for future investment. In addition, realized returns in the current period can be increased (perhaps enough to cover the cost of funds) by underspending against scheduled CAPEX. In both cases, the result is underinvestment in electricity distribution infrastructure. Of course, this can be corrected in future periods if the regulatory WACC is increased, realised returns are increased, or by external injection of funds (e.g., as proposed by the Queensland Government to remedy this very issue in relation to the ENERGEX and Ergon distribution businesses). The problem with this approach, of course, is that there are significant lead times involved. The Queensland distribution businesses, for example, are currently having difficulty obtaining the required infrastructure and skill base to implement a significant increase in CAPEX spending. The result is that the distribution network is likely to experience problems for some years.

Of course, there are also consequences of over-estimating beta and the required return. Some would argue that in this case there is an incentive for firms to over-invest in CAPEX. However this is a much less severe problem for two reasons. First, the regulator approves prudent CAPEX. Any overspend will not (initially at least) generate any return on capital for the firm. Contrasted with this is the fact that any CAPEX underspend is retained by the firm. Second, any CAPEX spending that really is beyond requirements is not simply waste. With a growing demand for power, this additional CAPEX would eventually be required. That is, the issue is simply one of timing—was the CAPEX really required today, or could it have waited for a year or two? Thus, the effects of CAPEX overspending are minor, relative to CAPEX underspending. In one case, investment earns a return for a year or two longer than it should have. In the other case, underspending causes network problems and the loss of power. The aggregate welfare effects are much more severe in this case.

This issue has recently been addressed in some detail by the Productivity Commission (PC), the Supreme Court of Western Australia and the Australian Competition Tribunal. For example, the Productivity Commission's Review of the National Access Regime recognises that the effects of too little infrastructure investment are far more severe than those associated with too much (or too early) investment. The PC states (p. xxii) that "Given that precision is not possible, access arrangements should encourage regulators to lean more towards facilitating investment than short term consumption of services when setting terms and conditions" and that "given the asymmetry in the costs of under- and over-compensation of facility owners, together with the informational uncertainties facing regulators, there is a strong in principle case to 'err' on the side of investors".

The PC goes on to quote from a submission to the review by NECG, which stated that "In using their discretion, regulators effectively face a choice between (i) erring on the side of lower access prices and seeking to ensure they remove any potential for monopoly rents and the consequent allocative inefficiencies from the system; or (ii) allowing higher access prices so as to ensure that sufficient incentives for efficient investment are retained, with the consequent productive and dynamic efficiencies such investment engenders. There are strong economic reasons in many regulated industries to place particular emphasis on ensuring the incentives are maintained for efficient investment and for continued productivity increases. The dynamic and productive efficiency costs associated with distorted incentives and with slower growth in productivity are almost always likely to outweigh any allocative efficiency losses associated with above-cost pricing. (sub. 39, p. 16)"

The PC Review highlighted the need to modify implementation of the regime and made 33 recommendations to improve its operation. In particular it identified as a "threshold issue, the need for the application of the regime to give proper regard to investment issues" and "the need to provide appropriate incentives for investment."

This view is supported by the Commonwealth Government, which has resolved to amend the Trade Practices Act in this regard. In particular, the access regime will be modified to include a clear objects clause: “The objective of this part is to promote the economically efficient operation and use of, and investment in, essential infrastructure services thereby promoting effective competition in upstream and downstream markets...”

In addition, a set of pricing principles will be included that requires “that regulated access prices should: (i) be set so as to generate expected revenue for a regulated service or services that is at least sufficient to meet the efficient costs of providing access to the regulated service or services; and (ii) include a return on investment commensurate with the regulatory and commercial risks involved...”

We believe that these views are consistent with the notion that a higher standard of evidence should be required to adopt an equity beta estimate below 1.0 than is required to adopt an estimate above 1.0. This is particularly so when the systematic risk and (assumed) gearing levels have cancelling effects on equity beta, as is the case for a water company.

Calculating the WACC for GAWB

Adopting the Vanilla WACC equation, described above as equation 1;

$$\text{WACC} = R_e \frac{S}{V} + R_d \frac{D}{V} \quad \dots (1)$$

Accepting that an equity β_e of a water company is likely to be close to the average ($\beta_e=1.0$), to the extent that a water company has a lower level of risk than the average company it is reflected in the significantly higher gearing than the average company.

Adopting the most recent yield on the government's long term bond rate as 5.35% (as at 11/02/05), and applying the CAPM, then:

$$R_e = 11.35\%$$

Accepting the GAWB's debt margin of 136 basis points, the estimate of the QCA, then

$$R_d = 6.71\%.$$

And accepting the gearing of 50% debt that is considered appropriate by the QCA and applying equation 1 we obtain a WACC estimate 9.03%.

If, instead of using the debt margin, the beta of debt is used ($\beta_d=0.11$) to estimate the expected cost of debt then the WACC is 8.68%, which implies an asset beta (β_a) for GAWB of 0.56 (see equation 3 above). This WACC estimate is the correct answer if the expected net cash flows are properly defined and estimated.