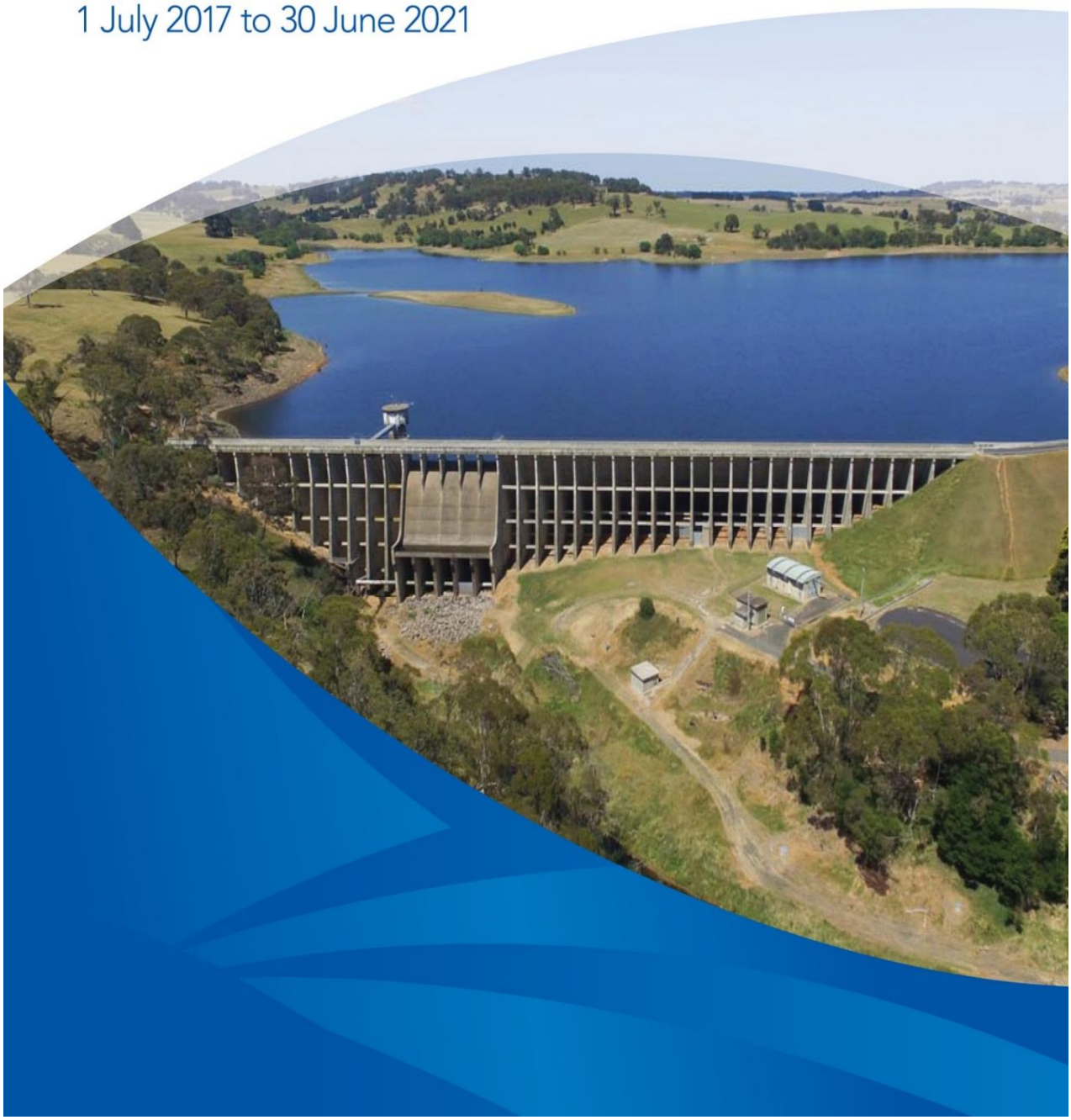
Response to the Independent Pricing and Regulatory Tribunal Draft Determination

Regulated prices for NSW Rural Bulk Water Services from

1 July 2017 to 30 June 2021



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Chief Executive Officer Foreword

WaterNSW would like to recognise the tremendous investment of time and effort by our customers in contributing to the development of our 2017-21 Pricing Proposal and the subsequent consultation process.

The highlights of our Pricing Proposal were reduced operating expenditure over the four year determination period by 20% compared to the current regulatory allowance as at 30 June 2017 and a reduced revenue requirement over the four years that is 11% lower than the current regulatory allowance. We welcome IPART's draft decision which largely maintained these levels for our customers.

During the process of developing our Pricing Proposal, we demonstrated a huge improvement in our consultation process and provided more comprehensive information to our customers.

This improved transparency and knowledge sharing included detailed information and improved customer understanding of tariff structure options and pass-through charges such as MDBA, over which WaterNSW has no control even though they have a material impact over customer bills.

This increased consultation led to a more robust and informed discussion at the recent IPART public hearing on its Draft Determination. Although we may differ with our customers on certain aspects of our proposal, greater knowledge sharing can only lead to better outcomes for our customers. WaterNSW is committed to continuing discussions with our customers on issues that are important to them.

This submission sets out those areas of IPART's Draft Determination where WaterNSW is seeking further improvement. It is an exceptions only submission which focuses only on those areas where WaterNSW is in disagreement with IPART or where further clarity is required.

We hope that it will assist IPART in making the final determination from an informed perspective.

David Harris
Chief Executive Officer
WaterNSW

Contents

1. Introduction

WaterNSW is pleased to provide this submission in response to the Independent Pricing and Regulatory Tribunal of NSW (IPART):

- Draft Determination of Prices for rural bulk water services from 1 July 2017 (Draft Determination); and
- Draft Report on its review of prices for rural bulk water services from 1 July 2017 to 30 June 2021(Draft Report).

IPART's review of prices for rural bulk water services from 1 July 2017 was initiated by WaterNSW's Pricing Proposal to IPART for regulated prices for NSW Rural Bulk Water Services from 1 July 2017 to 30 June 2021, 30 June 2016 (Pricing Proposal).

IPART released an issues paper on WaterNSW's Pricing Proposal on 13 September 2016 (Issues Paper). WaterNSW's submission in response to the Issues Paper of 17 October 2016 also amended our Pricing Proposal in relation to *Fisheries Management Act 1994 (NSW)* matters.

This submission is provided to IPART to inform its Final Determination for the period 1 July 2017 to 1 July 2021 (Final Determination). It is provided on an exceptions only basis, with issues not referenced by WaterNSW either supported or accepted by WaterNSW.

2. Capital Expenditure

2.1 Overview

WaterNSW's Pricing Proposal[1] included a request for a capital expenditure allowance of $186.6 million. $115 million or over 60 per cent of our request related to our maintain capability program ($28.8 million per annum). This was a step increase over the last determination which provided $19 million for maintain capability (or $6.3 million per annum).

This amount was designed to ensure that WaterNSW does not consume assets faster than we are able to re-invest to maintain their capability, and includes necessary 'catch-up' maintenance capital expenditure from years of under investment. WaterNSW uses a model of actual asset condition and risk data, with investment values benchmarked against a depreciated Modern Engineering Equivalent Replacement Asset (MEERA) value, to determine a cost efficient profile of re-investment for our assets.

In its Draft Report, IPART accepted in full the recommendations of Aither, the consultants engaged by IPART to undertake a review of the prudency and efficiency of operational and capital expenditure set out in WaterNSW's Pricing Proposal. The Aither recommendations are contained in its report "WaterNSW rural bulk water services expenditure review, A review of capital and operating expenditure", February 2017 (the Aither Report).

The cuts to WaterNSW's capital expenditure proposal recommended by Aither were in form of an overall cut to WaterNSW's maintain capability program of $21 million and $12.4 million of cuts based on Aither's review of a sample of projects[2], $33.4 million in total.

WaterNSW considers that its overall capital expenditure proposal is valid. However, to assist in achieving a realistic outcome, WaterNSW will be seeking reinstatement of $13 million of the $21 million cut to the maintain capability program. This amount is based on a review that we commissioned of WaterNSW's proposal and the Aither Report by Covaris Pty Ltd which is at Attachment A to this submission. The Covaris report is a balanced assessment of WaterNSW's

[1] Including our request for additional capital expenditure for fishways contained in our response to IPART's Issues Paper and subtracting an amount no longer required for the Keepit dam upgrade which we notified to IPART through the Aither review process.

[2] See pages 58 and 50 of the Draft Report.

proposal which provides a critical view of both WaterNSW and the Aither conclusions. It concludes that some cuts to WaterNSW's proposal were justified, only not to the extent proposed by Aither.

2.2 Precedent

WaterNSW's approach to determining its capital expenditure allowance has regulatory precedent. In its recent decision on SA Water's charges, "*SA Water Regulatory Determination, Final Determination, June 2016*", the Essential Services Commission of South Australia (ESCOSA), accepted a risk based asset assessment for two classes of expenditure:

- Water Networks – Structures – Asset Program – to renew and replace elements of structures (for example, concrete) to avoid failure and eventual loss of water supply ($98.3 million); and
- Water Network – Structures – Treatment Plants – Asset Program – to renew and replace elements of structures (for example, concrete) to avoid failure and expensive replacement costs ($43.1 million).

In relation to Water Networks- Structures - Asset Program, in a similar way to WaterNSW, the prior regulatory period was focused on larger structures while the period of the 2016 Determination was focused on smaller structures. Atkins-Cardno were engaged by ESCOSA to perform the review of capital and operating expenditure plans. In their report, Atkins-Carno[3] noted at page 98:

> The RBP2016 program is 51% by value focused on the smaller (≤10ML) storage facilities: Metro Storages (35 No.) and Country Storages (24 No.) at $53.3M. These have been identified as having intolerable risk of failure and condition grades 4 and 5. The Metro Storages (16 No.) and Country Storages (44 No.) that have been inspected and found to have tolerable risks of failure and condition grades 4 and 5 at ($33.4M of potential work) have not been included in the program. We believe that this is a prudent approach. **The use of a risk matrix approach to scheme prioritization was explained and demonstrated. The level of sophistication applied to the development of the Structures WN Renewal SFL project is adequate for the RBP2016 period when the focus will be on resolving the backlog.** The build-up of a backlog puts into question the earlier asset management practices, and it is comforting to see the effort that has been put into inspecting these key assets in order to identify and prioritize expenditure.
>
> Within the work identified, there needs to be urgent consideration of the criticality of the assets, as potentially offset by mitigation measures. Where network vulnerability is confirmed, operational response plans should be developed to be used in the event of failure before the backlog has been resolved. **For the development of future programs, the risk matrix needs to consider mitigation and a full range of options.** The process to determine cost of repairs is set out in an Estimating Document. Based on the asset condition inspection work done to date, we believe that the 'Contingency/Emerging Issues' allowance of $10M (pre-efficiency) is adequate to cover uncertainty in this program, and recommend that the further $12M 'Undefined – Based on condition assessments planned' funding line should be removed.

As noted in the extract from the Atkins-Cardno report above, further refinement of the model was recommended for future pricing determinations. However, this did not invalidate its use for the period of the 2016 Determination. In a similar way, both Aither and Covaris have recommended improvements to WaterNSW's approach, however, this should not require the quantum of cut which Aither has recommended and which Covaris have opined, at page 46 of their report, is too large considering the risk:

> "*Some valleys simply cannot tolerate an arbitrary reduction which is applied evenly across the state since their individual risk profile is too high*."

[3] "Review of capital and operating expenditure plans of SA Water, Report, 22 January 2016".

3. Operating Expenditure

3.1 Overview

WaterNSW welcomes IPART's draft decision regarding operating expenditure for the determination period. WaterNSW proposed substantial reductions to its operating expenditure arising from merger efficiencies of the newly formed WaterNSW entity from the former State Water and former Sydney Catchment Authority. WaterNSW is pleased to see that these reductions have been accepted to enable WaterNSW to provide better services to customer at lower cost over the forthcoming period.

As with any business transformation, WaterNSW will need an opportunity to bed down its new organisational structure, internal operating mode and changed internal procedures. Noting that since the merger, WaterNSW has faced additional business change through the addition of staff from DPI Water to undertake transferred Water Administration Ministerial Corporation ("WAMC") functions.

For the 2021 Determination, WaterNSW is expecting to be in a better position to determine the success of the current organisational structure and operating environment to provide our customers with the appropriate service standards. At this stage we are confident that increases to operating expenditure at that time will not be required and are hopeful that we can provide our customers with further reductions. In the event that savings are realised sooner, WaterNSW notes that under section 18(2) of the Independent Pricing and Regulatory Tribunal Act 1992 it is open to WaterNSW to seek the approval of the Treasurer to set prices below those determined by IPART.

3.2 20 year infrastructure strategy

WaterNSW takes issue with IPART's draft decision not to allow the full amount for the 20 year infrastructure strategy. IPART followed Aither's recommendation on this issue as set out in the Aither Report. As noted by IPART at page 50 of the Draft Report, Aither acknowledged that a long term approach to asset management is consistent with a prudent service provider because such an approach leads to more efficient outcomes in the long-term, which is to the benefit of customers in terms of lower cost and higher service levels.

Aither stated that it was not convinced that WaterNSW had proposed costs that are efficient on three particular observations[4]. We set those out in Table 1 below together with our rebuttal.

Table 1 – Aither observations on 20 year infrastructure strategy opex and WaterNSW response

Aither observation	WaterNSW's response
WaterNSW does not appear to have reflected any synergies in undertaking similar tasks across different valleys over the regulatory period. In saying this, we are referring to the extent to which WaterNSW had reduced its forecast costs over time as more valleys are undertaken and the lessons learned from those valleys are translated into the activities undertaken in other valleys	The reason that the costs of the 20 year infrastructure strategy have been designed around individual valleys is that the work has to be valley specific and is not capable of being synergised with other valleys. The strategies require: • significant series of cycles of customer consultation to be undertaken within each valley based on customer levels of service preferences. A major component of this is developing a new valley customer specific long-term strategic capital and operating options and assessing customers willingness to pay • significant hydrological and pricing modelling to be undertaken in respect of each valley. This includes complex water modelling, identifying potential structures within the valleys, estimating the costs of the structures and how these costs translate to prices for customers within the valley. Although some process lessons may be identified, these

[4] At page 110 of the Aither Final Report.

	do not outweigh the substantive new individual work that needs to be performed for each valley. Moreover, there are substantive idiosyncrasies within each valley due to legacy issues from previous organisational, regulatory and Government decisions, some which are very complex as IPART has experienced from its review of the North and South Coast during this determination process.
The coarseness (or lack of specificity) regarding how individual components of the forecasts have been derived indicates to us that these estimates may be very preliminary in nature, thus increasing our uncertainty with regard to the robustness of these forecasts.	As this is a new function to WaterNSW it is not unusual for there to be some coarseness to the forecasts. WaterNSW has not undertaken a program like this before which is complicated by the number of individual valleys and water systems for which this work needs to be performed. On that basis, the forecasts may well underestimate the effort required to undertake the tasks rather than overestimate them. We are disappointed that only a downward adjustment, rather than an upward adjustment was deemed necessary.
If Peel, North Coast and South Coast, which are the low complexity valleys that skew the overall average cost down, are removed from the analysis, the average cost per valley is significant, at around $400k over the regulatory period. Based on our experience, this would appear to be at the absolute top end of the reasonable range, which in turn means it is unlikely to reflect WaterNSW's "expected" costs	At the time of putting together the expected costs, WaterNSW was only at the preliminary stages of the North Coast levels of service work. We have since progressed this work and we note that although there are fewer structures and entitlement holders in the North and South Coast, as these valleys are below cost recovery, the issues and possible options are from that perspective as complex or more complex than valleys which are at full cost recovery. This leads us to conclude that our estimates may have been overly conservative.

4. Managing volatility

4.1.1 Introduction

WaterNSW welcomes IPART's recognition that we should receive our revenue in relative alignment to our largely fixed cost base and its support of an 80:20 price structure[5]. However, WaterNSW does not accept that the $0.765 million per annum allowance for volatility self-insurance, to replicate an 80:20 from the current price structures, reflects the efficient cost of providing customer choice on tariff structure.

4.1.2 The prudent and efficient cost of volatility insurance is $1.3 million per annum

WaterNSW has undertaken a 12 month procurement process in relation to revenue volatility insurance, and are pleased to now be in a position to update our Pricing Proposal with a -**$2.3 million per annum reduction** in expected costs, down from the $3.6 million preliminary quote included in our Pricing Proposal to $1.3 million per annum.

This cost is the result of a competitive market procurement process undertaken with the insurance industry, supported by independent actuarial and reinsurance advice. WaterNSW considers that IPART should accept this as the prudent and efficient cost of providing customers with their preferred price structures, in place of the volatility allowance included in the Draft Determination.

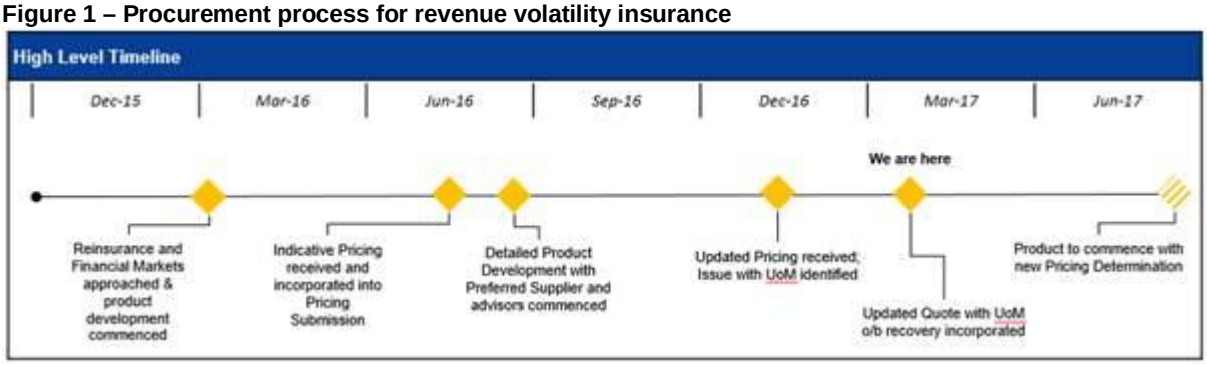
Our procurement process is set out in Table 2 and Figure 1 below.

[5] See page 84 of the Draft Report.

Table 2 – Procurement process for revenue volatility insurance

March 2016	• Interest sought from insurance and investment banking markets
March 2016 – June 2016	• Product development with interested parties, including actuarial advice
June 2016	• Indicative and non-binding pricing proposals received from insurance market • $3.6 million quote included in 2015 pricing proposal
July 2016 onwards	• Detailed product development with preferred proponent, including Reinsurance Brokers
December 2016	• $1.3 million quote received for 80:20 replication if UoM reset to zero or discontinued & UoM opening balance recovered separately
March 2017	• $2.8 million quote received for 80:20 replication if UoM not reset to zero or discontinued & UoM opening balance recovered through a custom option on the insurance product

Figure 1 – Procurement process for revenue volatility insurance



WaterNSW considers the procurement of this volatility insurance as being an efficient and innovative solution to providing customer choice of tariff structure while at the same time as providing WaterNSW with the revenue structure more appropriate for its cost structure. The insurance product will be a relatively new development for the Australian water industry.

4.1.3 WaterNSW will still face higher risk than other bulk water utilities

WaterNSW notes that even at an 80:20 fixed to variable pricing structure, WaterNSW is exposed to more volatility than other Part 6 operators under the Water Charge Infrastructure Rules (WCIR). For example, the Victorian utility, Goulburn Murray Water, has a pricing structure of 90:10 fixed to variable for irrigation services and 100:0 fixed to variable for bulk water services. Further, for SunWater Systems, the ACCC reported in its 2013-14 ACCC Monitoring Report that customer bills comprise 85 and 99 per cent fixed charges (with some exceptions).

WaterNSW is not being compensated for the increased exposure to volatility risk in the rural valleys. That is, it receives the same equity compensation (equity beta and market risk premium) as businesses with much lower revenue risk (such as the Victorian utilities cited above, and WaterNSW's Greater Sydney valley).

4.1.4 WaterNSW supports customer tariff choice

WaterNSW supports customer choice on tariff structure. The tariff structures proposed in our Pricing Proposal were those endorsed by customer representatives at Customer Service Committees.

The volatility insurance quotes WaterNSW has received from the insurance market are for the total revenue covering the Hunter Valley and the 8 Murray Darling Basin valleys excluding the

Lowbidgee (100% fixed charge) and Fish River (which we proposed would move to an 80:20 revenue structure). We proposed to exclude the North and South Coast valleys on the basis they are not yet at full cost recovery.

If a valley elects to move to a higher fixed charge pricing structure than the current 40:60 or 60:40 structures, WaterNSW will support this and would seek to remove that particular valley from the volatility insurance cover. We would seek a re-quote of the product accordingly (noting that the premium reduction may not be perfectly linear).[6]

Furthermore, as discussed in WaterNSW's Pricing Proposal (p. 40) the volatility insurance product provides a possible foundation in the future for more flexible arrangements with customers. For example, it may enable future facilitation of individual customers being able to choose their tariff structure.

4.1.5 It is not prudent or efficient for WaterNSW to "self-insure" against revenue volatility

WaterNSW does not believe it would be innovative or efficient for WaterNSW to self-insure.

Self-insurance is not a new, nor an efficient strategy, for WaterNSW. In effect WaterNSW has, in the past, been "self-insuring" – that is, fully bearing revenue risk arising from the 40:60 pricing structure and not managing the risk. As a result, WaterNSW has borne significant losses (under-recovery) during both the 2006 and 2014 pricing periods. Over the period 2006 to 2016, the WaterNSW cumulative under-recovery amounts to $64.3 million[7].

Self-insurance can be an efficient strategy for firms where risks are naturally internally diversified by the firm. For example, many firms self-insure risks for individual business lines (e.g. associated with exchange rates, fire, road-accidents etc.) when the risk is sufficiently diversified across the aggregated business and/or over time.

However, self-insurance is not practical nor achievable for WaterNSW with regards to water usage revenue. Revenue from water usage is too significant relative to total revenue, and there is high correlation of water usage revenue between valleys. The diversification benefits over time are also small. Water usage in any given year is highly correlated with previous years, droughts can persist for many years (spanning regulatory periods) and there is a risk of long term trends. The 20 year rolling average for the calculation of expected water sales for pricing purposes means that volatility is only gradually reflected in prices over time.

There is substantial evidence that revenue and cashflow volatility is value-destructive[8], and that managing risk through insurance or hedging is a prudent activity for business managers and adds to firm value[9,10].

Continuing to bear volatility as suggested by IPART in its Draft Report is basically choosing to continue to bear the associated revenue risk and costs. This is inconsistent with IPART's stated agreement that we should have an 80:20 pricing structure in recognition of our highly fixed cost-base[11] and low risk compensation (i.e. Equity Beta of 0.7). We also note that the former State Water Corporation received a lower credit rating (Baa3/BBB-) despite:

- having a capital structure less than half the notional efficient benchmark of 60% Net debt to RAB due to the revenue risk arising from the 40:60 high variable pricing structure,

[6] WaterNSW will seek to work closely with IPART to ensure that any such changes occur prior to the commencement of the 2017 determination.
[7] Assuming no payback of the UOM balance accrued in the 2014-17 determination period
[8] Rountree, B., J. Weston, and G. Allayannis. 2008. Do Investors Value Smooth Performance? Journal of Financial Economics. 90: 237-251. who (p. 1) find "that a 1% increase in cash-flow volatility is associated with approximately a 0.15% reduction in firm value."
[9] Aretz, K., Bartram, S. M., & Dufey, G. (2007). Why hedge? Rationales for corporate hedging and value implications. The Journal of Risk Finance, 8(5), 434-449.
[10] MacKay, P., & Moeller, S. B. (2007). The value of corporate risk management. The Journal of Finance, 62(3), 1379-1419. In an examination of oil-refiners they found that hedging revenues increased firm value by 2 to 3 per cent.
[11] See page 85 of the Draft Report

- earning a higher WACC at the time and
- IPART providing a volatility allowance of $2 million per annum for the 2010 price period.

As a bulk water supplier, WaterNSW does not consider insurance to be our core business – we are concerned that there would be significantly more cost in us trying to replicate a self-insurance scheme ourselves than outsourcing it to dedicated professional risk managers. Running a self-insurance scheme ourselves is tantamount to setting up a new "non-regulated" risk management service offering.

The cost of a self-insurance scheme would need to include:

- a Capital Buffer to shield WaterNSW from the volatility (i.e. akin to financial institution minimum capital reserves). Interest costs of holding 1 year's "value at risk" as a capital buffer would be $0.837 million (5.2% x $16.1 million).
- a Risk Premium (this is the IPART volatility allowance - $1.3 million see 4.1.8 below) Management time and resources – conservatively estimated at 1 FTE to administer the scheme and ongoing actuarial advisory costs ($0.25 million per annum),

totaling $2.4 million.

4.1.6 A market tested price is the best evidence of the efficient cost

WaterNSW submits that its market-testing / procurement approach represents the best method of determining the prudent and efficient costs of volatility. Indeed, the insurance market has advised WaterNSW that the method used by IPART to determine its volatility allowance is not reflective of how they have assessed the volatility risk in pricing the volatility product for WaterNSW.

This is evidenced by regulatory practise in other jurisdictions. For example, in determining the efficient costs of self-insurance for National Grid, the UK regulator OfGem relied on a market testing process.

Market testing determines who is best able to diversify risk. The external market is often lower than self-insurance when, as is the case for WaterNSW, the source of volatility is external to the organisation (i.e. outside of WaterNSW's influence) and well understood.

4.1.7 Concerns in relation to the IPART calculation approach

WaterNSW appreciates that estimating the cost of revenue volatility is not straight forward. The true costs should incorporate a range of costs including financing, financial distress, taxation and management/administration.

One possible approach is to estimate the cost of financing to negate any risk of volatility. However there are challenges to this approach:

- there is no certainty as to how long the financing will be required. Consequently any additional financing would need to be in the form of equity.
- it is uncertain as to when the additional financing will be required. The cost of equity (and financing more generally) can escalate significantly and at times (e.g. during the period of the global financial crisis) effectively unobtainable.
- the accumulated shortfall in revenue can continually increase indefinitely and it is difficult to put a limit on the amount of equity that would be required.

Consequently adopting this approach would lead to very high costs and we expect multiples higher than the quoted cost for the volatility insurance product.

WaterNSW also notes that the method proposed by IPART in the Draft Report differs substantially to that previously applied by IPART in the 2010 to 2014 period. The formula then applied by IPART involved the cost of financing (at the WACC) of four continuous years of 'low

extractions'.[12] IPART's Draft Report does not provide an explanation as to what has changed to WaterNSW's operating environment since the 2010 determination period to warrant a change in the methodology of the volatility allowance. WaterNSW is exposed to the same revenue risk faced by the (then) State Water Corporation during the 2010-2014 determination period.

Using this previous IPART method, the volatility allowance is approximately $2 million per annum; which is over 2.5 times the value IPART has calculated using the new method.
The new method IPART has proposed in its Draft Report, is a simple formula that calculates the volatility allowance as:

- value at Risk of an 80:20 fixed to variable tariff structure; multiplied by
- opportunity cost at WACC; multiplied by
- the number of years over the determination period in which actual usage is unlikely to support the recovery of the Value at Risk (the duration factor).

WaterNSW submits to IPART that this method is not reflective of how the insurance market values risk, and is an unstable approach to determining an allowance for volatility. For example, a different pattern of water usage could lead to a substantially different value calculated by the formula but no material change in revenue risk in WaterNSW.[13]

Other concerns we have with the IPART calculation approach include that:

- the formula is based on volatility of water usage rather than usage revenue.
- the calculation of the duration factor should reflect the period that there is an accumulated revenue shortfall – not a discrete number of years,
- the opportunity cost of the value of risk should be the cost of equity reflecting an indeterminate period and should include some allowance for financing risk (i.e. the risk of needing to raise finance during an economic downturn), and
- there should be some allowance for the management costs associated with volatility.

WaterNSW's position is that IPART should accept the insurance market quote for volatility insurance as the prudent and efficient costs of managing revenue volatility. However if IPART wishes to continue to use the calculation approach in its Draft Report it should have regard to the following matters:

- duration factor
- diversification, and
- the cost of financing the opportunity cost

4.1.7..1 The duration factor

The duration factor reduces the aggregated opportunity cost, in proportion to the number of years over the 1997-2016 period in which actual usage does not support the recovery of 80 per cent of the user share of revenue *at the portfolio level*, which is normalised over 4 year determination period.

There are a number of issues how the duration factor is applied.

First, the duration factor is based on a discrete number of years. The discrete nature of this factor means that a small change in usage in one year can have a large change in the duration factor[14].

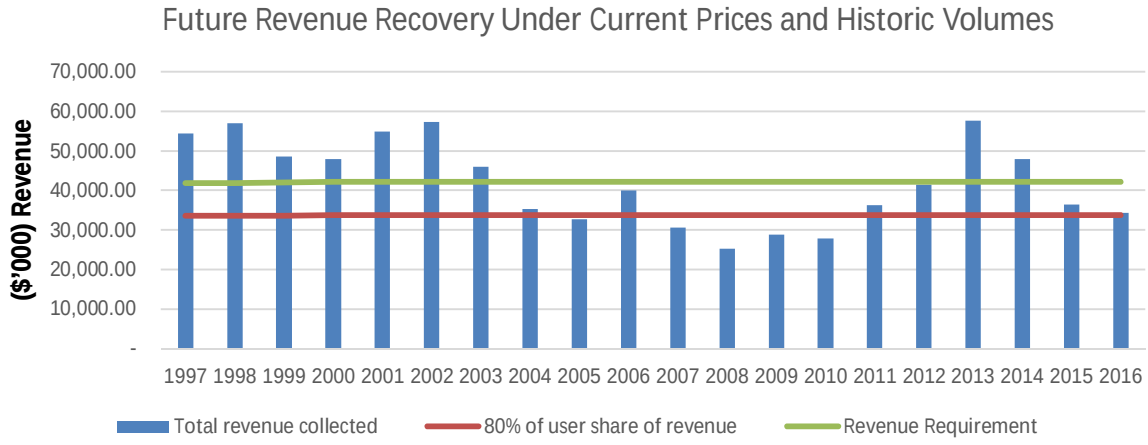
[12] Where 'low extractions' were calculated as historic mean extractions less the historic mean absolute deviation.
[13] For example (referring to Figure 8.1) if water usage in 2011 was slightly higher in 2010 and slightly lower in 2011 the duration factor would lift from by 25% (from 0.8 to 1.0) despite there being no change in the revenue shortfall for WaterNSW. Similar changes in the distribution of water usage during the period of 2004 to 2011 could conceivably result in duration factors being as low as 0.2 and as high as 1.4)
[14] For example (referring to Figure 2) if water usage in 2011 was slightly higher in 2010 and slightly lower in 2011 the duration factor would lift from by 25% (from 0.8 to 1.0) despite there being no change in the revenue shortfall for WaterNSW. Similar changes in the distribution of water usage during the period of 2004 to 2011 could conceivably result in duration factors being as low as 0.2 and as high as 1.4)

A second issue is that the duration factor is calculated based on aggregated water use and not aggregated revenue. Using actual data as an indication of possible future usage, IPART has implied that lower usage in the Border in 2014-15 could be supported by higher usage in the Murray and Murrumbidgee in 2014-15. This approach uses cross subsidisation between Northern valley and Southern valley customers.

WaterNSW's own analysis of usage and revenue volatility, replicated and confirmed by the insurance market, highlights the importance of focusing on revenue volatility. For example, in 2014-15, WaterNSW incurred a significant revenue shortfall of $8.0 million ($5.0 million excluding the Fish River Scheme) compared to the revenue allowance in the 2014 ACCC Final Decision[15], as actual water sales in the Northern and Central valleys were (in most cases) significantly under the 20 year rolling average of actual water sales. Although the decline in water sales in the Northern and Central valleys was partially offset by an increase in water sales in the Southern valleys, the revenue collected per ML of water extracted from the river system was significantly less in the Southern valleys compared to the Northern and Central valleys.[16] IPART's approach which aggregates total usage in all valleys ignores the respective weightings of each valley's usage in relation to revenue.

If revenue volatility were used then the duration would be increased from 0.8 to 1.0. This is illustrated in Figure 1below - identifying years 2005, 2007 to 2010, 5 years producing a duration factor of 1.0. Appling this duration factor would increase the volatility allowance to $0.965 million (using WACC) and $1.143 at sum of valleys (i.e. excluding claimed diversification benefit).

Figure 2: Future revenue recovery under current prices and historic volumes



*Revenue is in 2016-17$ (i.e no inflation)

A third issue is that the risk to WaterNSW relates to the accumulated revenue shortfall. As is evident from the above figure, water usage in one year is highly correlated with usage the previous year. Consequently, WaterNSW's accumulated shortfall can build-up and the duration over which WaterNSW needs to secure additional financing can be substantial. The proposed IPART method makes no allowance for this correlation.

4.1.7..2 Claimed Diversification Benefit

A symptom of the duration issue is the sensitivity of the formula to whether it is being applied at a valley or aggregate (portfolio level). IPART[17] notes the volatility allowance when calculated on an individual valley levels sums to $1.1 million per annum or $4.5 million over the 4 years of the

[15] Australian Competition and Consumer Commission, ACCC Final Decision on State Water Pricing Application: 2014-15 – 2016-17, June 2014.
[16] See page 123 of WaterNSW's Pricing Proposal to IPART, Regulated prices for NSW Rural Bulk Water Services from 1 July 2017 to 30 June 2021.
[17] At footnote 153 on page 88 of the Draft Report.

determination. IPART calculated the portfolio - by aggregating the usage of all valleys – resulting in a $3.1 million total over the 4 years. IPART interpreted the difference between these two values as diversification benefits reducing the volatility allowance from $1.134 million per annum to $0.765 million (-$370k per annum).

However, the diversification benefit is actually very small. Observation of historical water volumes shows very limited diversification benefit between valleys, or put another way, very high correlation between valleys. This is shown in Figure 3 below. An analysis of the correlation coefficient between each valley of their over and under recovery against total over/under recovery in the rural valleys shows a correlation close to 1. This is shown in Figure 4 below. This demonstrates that the $370k discount that IPART applies is not supported by the data from the valleys.

Figure 3: Historic water volumes show close correlation between valleys

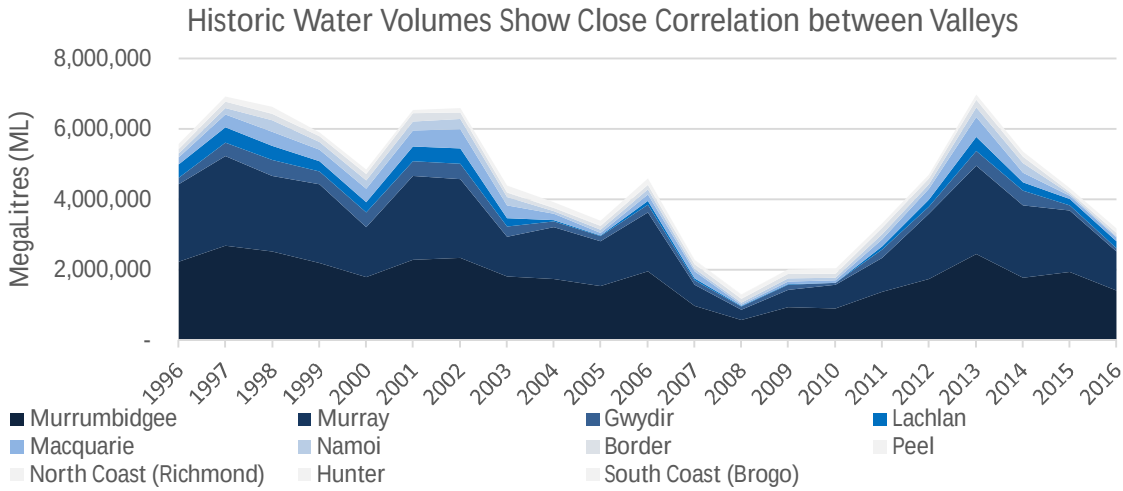
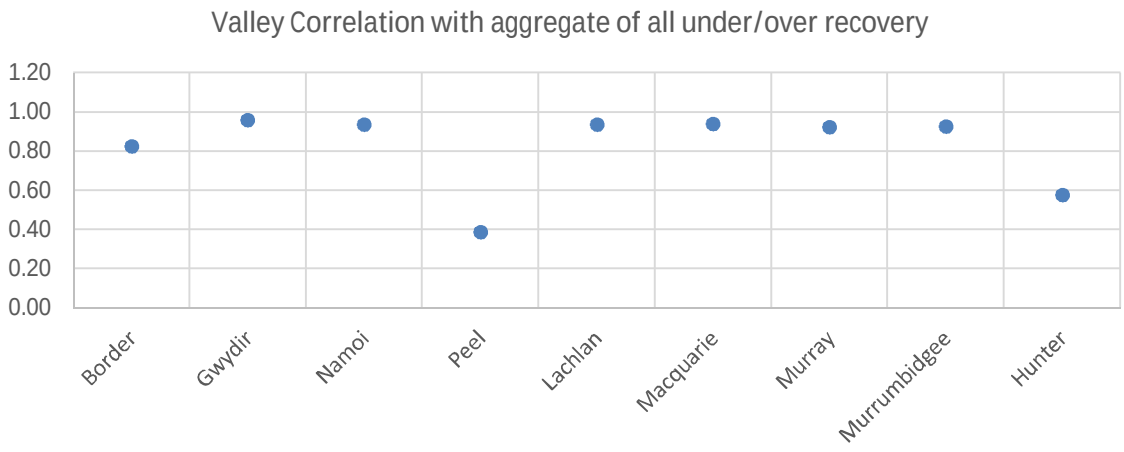


Figure 4: Valley correlation with aggregate of all under/over recovery



The significant difference due to aggregation is due to the method of determining the duration factor.

4.1.7..3 Financing cost

The new IPART formula assumes that the opportunity cost can be financed at the WACC. However, this is unrealistic given that the additional finance is required for an indeterminate period of time. Financing for an indeterminate period requires equity financing. Furthermore,

WaterNSW faces a timing risk when such additional finance is required during time a time during a credit squeeze where costs of financing are very high.

4.1.8 Conclusion

By using the cost of equity as the discount rate and a duration factor of 1.0 and calculating the allowance as the sum of the individual valleys (i.e. removing the assumed diversification benefit), the cost of self-insuring will increase to $1.35 million per annum – which will meet the quoted cost of the product WaterNSW has obtained from the insurance market for the 2017-18 to 2020-21 period through a proper procurement process.

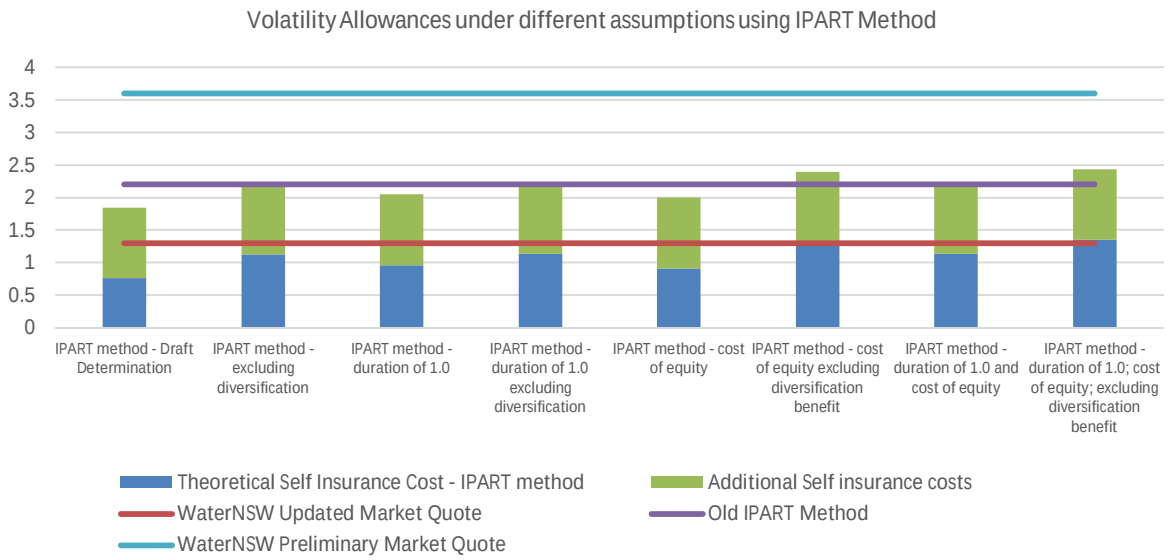
This calculation still underestimates the true costs of self-insuring as it does not take into account:

- the duration factor should reflect the periods of accumulated under-recovery
- the cost of financing should be adjusted upwards for the risk of needing to raise finance during a credit squeeze, and
- the management costs associated with self-insuring.

As noted in section 4.1.5 above, once these costs are included, the far exceed the $1.3 million quote received from the insurance product.

Figure 5 below shows how WaterNSW's updated quote of $1.3 million per annum compares with its original quote, the IPART 2010 methodology and IPART's methodology in its Draft Report under different input assumptions and the additional costs of self-insurance.

Figure 5: Volatility Allowances under different assumptions using the IPART method



On this basis WaterNSW submits that IPART should allow $1.3 million per annum to allow the insurance product to be purchased, achieving replication of 80:20 price structures in the rural valleys in an efficient market-tested; and new and innovative way for the Australian water market.

5. Customer choice on tariff structure

5.1 IPART consultation

At page 90 of its Draft Report, IPART seeks comment on the following questions:

> *1 To apply an 80:20 fixed to variable price structure to a valley, would 100% of customers in that valley need to express written support for the change, or would a majority suffice? If a majority would suffice, then would a majority be based on number of customers or the*

volume of entitlements in that valley? If based on entitlements, should HS entitlements receive greater weight? Or

2 Would it be reasonable to apply an 80:20 fixed to variable price structure if all the members of a Customer Service Committee (CSC) for the valley were in support, or would majority support be sufficient? Under this, we would expect that all customers in the valley would at least need to be informed of the potential change.

3 Are there any other considerations that IPART should be mindful of?

A 100% agreement would seem to be an impossible burden to achieve. Other changes people are familiar with are based on a majority of people who vote making the decision (e.g. elections, voting on most motions in an AGM).

WaterNSW (and the former State Water) have had Customer Service Committees as a key customer consultative group in place for over a decade. Each of the major irrigator representative bodies of each of the valleys are members or have members of theirs as representatives. WaterNSW has a history of engaging with Customer Service Committees on pricing proposals, in their role as representatives of the valley customers.

Section 5.1.1 of the current WaterNSW (State Water Corporation) Operating Licence states WaterNSW must regularly consult with valley-based customer service committees (CSCs) to enable customer involvement in issues relevant to the performance of WaterNSW's obligations to customers under the Operating Licence or the customer service charter referred to in clause 5.2 of the Operating Licence.

WaterNSW's believes Customer Service Committees support should be sufficient as they will need to reach a consensus before exercising that support.

WaterNSW is making investments in developing a Customer Relationship Management (CRM) System but will not expect to begin deploying until the end of calendar 2017. This will provide WaterNSW with greater capability in engaging directly with customers through online polling in addition to customer service committees or equivalent forums in the future.

5.2 Lowbidgee – 80:20

5.2.1 Introduction

WaterNSW's Pricing Proposal sought the continuation of a 100% fixed entitlement charge as per the 2014-17 ACCC Final Decision for the Lowbidgee Flood Control and Irrigation District.
In its Draft Report at page 112, IPART proposed to introduce an 80:20 fixed to variable tariff structure to:

- reflect the variable nature of supplementary water access in the Lowbidgee; and
- provide an incentive for WaterNSW to address customer billing issues raised by some Lowbidgee customers.

WaterNSW opposes the introduction of an 80:20 fixed to variable tariff structure:

- WaterNSW believes that it is premature for IPART to conclude that a variable charge should be *introduced, as an incentive* for WaterNSW to resolve the metering issues. As a bare minimum WaterNSW should be given the opportunity to engage with all Lowbidgee customers (including 18 potential customers) through its Levels of Service Program to resolve any billing/tariff issues

- the Lowbidgee water charge has been set using only 4 years of actual data. As there is a lack of any substantial time series data to make reasonable predictions on future water use in the Lowbidgee, WaterNSW submits that IPART should retain the fixed charge.

5.2.2 Background

There are currently 4 Lowbidgee licence holders. These licence holders collectively hold 747,000 unit shares of supplementary water access licences in the Lowbidgee. 73% of these entitlements are held by:

- the Environmental Water Holder in the Nimmie-Caira, where 19 properties have been acquired as part of the joint Governmental Nimmie-Caira project; and
- the Minister for National Parks (via Yanga National Park) in the Redbank South area.

There are 198,889 units of supplementary licences in Redbank North, which are held by one irrigator and Balranald Council (as primary holder). WaterNSW understands that there are 18 water users who use the water of Balranald Council (as primary holder) and who are in the process of obtaining their own water entitlements, through subdividing the entitlement.

As an interim measure, WaterNSW has directly invoiced the 18 water users, noting that they are not the primary holder of the licences. The billing issues from this arrangement are further exacerbated by the requirement to calculate a variable bill under the WAMC Determination, the quantum of which may be challenged by some of the beneficiaries of the Lowbidgee supplementary flows due to the inability to measure usage within the Lowbidgee floodplain.

WaterNSW understands that issues were raised with the accuracy of measuring usage within the Redbank North area by a Lowbidgee irrigator. It has been argued that the measurement of water extractions between the 18 water users within the Redbank North area is not based on accurate measurement at each 'point of take'. A further point of contention is that water losses occur within the Redbank North Channel.

5.2.3 WaterNSW obligations – measuring water use

WaterNSW believes that it is premature for IPART to conclude that a variable charge should be introduced, *as an incentive* for WaterNSW to resolve the metering issues.

Under the Lowbidgee water distribution rules, licence holders within the Lowbidgee take water from the nominated supply works, which are the points of diversion from the Murrumbidgee River into the Lowbidgee, (i.e. Glen Dee Regulator and Redbank Weir Regulator) even though most properties are remote from these offtakes. It is at these points where WaterNSW is required to install, maintain and operate any device or devices for measuring the volume of water extracted from the river, which it has done. It is also at these points where water orders are placed, hence this is the point where WaterNSW's obligations end with respect to measuring water use. Any losses that occur past the point of diversion are the responsibility of the customer.

WaterNSW installed a new Sontek channel meter at the point of diversion, as part of the NSW Metering Program, the cost of which was funded by the Commonwealth and not by customers. The meter returned an accuracy reading of +/-2.7%, which is within allowable tolerances and technical specifications. There are a number of external factors which can cause channel meters to become inaccurate, such as debris, deposition of silt, and siltation of the sensors. Our current maintenance regime requires contractors attend to the site meter as issues occur. A Sontek hydrometric station (formerly owned by DPI Water) is located 200 meters from the channel meter and is used as backup in instances where the Sontek Channel meter is unavailable.

Once the 18 water users are issued with new (individual) licences in the Redbank North area, they will be linked to the WaterNSW Water Supply Works Approval in accordance with the

Lowbidgee Distribution Rules. This means that water extractions will continue to be measured at the point of diversion as per the nominated supply works.

5.2.4 Metering issues associated with the Lowbidgee floodplain

The North Redbank channel[18] only supplies part of the water in Redbank North, and significant volumes are delivered via the original floodplain, cascading from one property to the next (see Figure 6). There is no practical method to accurately meter this water, and therefore no accurate method for allocation of usage charges to individual licences. This issue was addressed through the original 'area benefitted' per hectare charge, prior to the 2014 ACCC Final Decision and reflected through the current fixed entitlement charges in the 2014 ACCC Final Decision.

Figure 6: Lowbidgee Flood Plain – there is no practical method to accurately meter this water

If a customer wishes to identify a different point of water extraction – other than the point of diversion - this would imply delinking the Lowbidgee licence with the WaterNSW works approval. This would involve considerable discussions with DPI Water and a potential review of the Lowbidgee distribution rules (which specify the WaterNSW works approval as the point of extraction). Further, under the water supply works approval, the approval holder must install metering equipment that complies with Australian Standard AS 4747, however, compliance may be impractical in a floodplain environment.

5.2.5 Mutual agreement between licence holders

Licence holders may reach a mutual agreement on allocating usage charges and water losses between themselves. WaterNSW is willing to provide our customers with assistance on this process, however, ultimately this is a matter for customers as it is an issue with respect to water losses past the point of diversion.

Through our Levels of Service Program, WaterNSW is committed to working with existing and future Lowbidgee customers on developing and assessing the cost of any discretionary service

[18] The legal ownership arrangements of the Redbank North Channel are in dispute. At this stage, WaterNSW is not in a position to comment on whether maintenance work by WaterNSW on the Redbank North Channel is appropriate.

that may be requested by customers. Noting that the installation of additional measurement devices may impose significant cost on customers, for example, open channel' meters, have relatively high operating and capital costs.

However, the introduction of any discretionary service would have to be based on an informed choice by the majority of Lowbidgee customers. WaterNSW understands that internal metering issues might not occur in the Redbank South and Nimmie Caira area, where 73% of Lowbidgee entitlements are held, and the benefited land is owned by Government. WaterNSW queries whether, the additional cost of any discretionary service (e.g. internal metering) specific to Redbank North customers, should be shared with Redbank South and the Nimme Caira area based on proportion of entitlements (37% Redbank North to 73% other customers).

5.2.6 Forecasting usage and implementation of a variable charge

WaterNSW questions the appropriateness of introducing a variable charge in the Lowbidgee, which has been set using a 4 year averaging period. .
Lowbidgee water users receive supplementary flows which are triggered by unforeseen events which are not factored into allocation announcements and by their nature are highly variable.

As a result, the recovery of 20% of WaterNSW's prudent and efficient costs would depend on supplementary flows, with usage patterns which are difficult to forecast or predict. Further, depending on climatic cycles, the 80:20 tariff split may produce a perverse outcome, where 20% of WaterNSW's prudent and efficient cost is not recovered over a substantial period of time. For example, prior to 2011, WaterNSW understands that there had not been any significant overbank flows in Nimmie-Caira since 1996.

The Lowbidgee usage charge *should* be levied on all water extractions from the WaterNSW water supply works, as Lowbidgee water users receive the benefit of all water which flows through the water supply works, as triggered by a supplementary flood event.

Section 5.2.4 above notes the difficulties with metering a floodplain. WaterNSW's experience under the DPI variable charge is that:

- WaterNSW is only able to measure water extractions in relation to some of the water which flows through the water supply works (i.e. water orders, which are placed by customers before the supplementary flows become uncontrolled);
- WaterNSW is *unable* to measure water extractions for uncontrolled supplementary flows, as there is no practical method to meter this water; and
- WaterNSW is unable to measure the flow from one property to the next across the floodplain.

Therefore, the data used by IPART to set the variable charge only includes part of the water which flows through the water supply works. The introduction of a variable charge in this manner will shift additional cost burden to those customers who place water orders prior to an uncontrolled supplementary flow (e.g. water users located closer to the water supply works).

WaterNSW further notes that the introduction of the DPI variable charge (and IPART's proposal in its Draft Determination) has created a situation where:

- some customers can avoid the variable cost component of the Lowbidgee; while
- these same customers receive the benefit of an uncontrolled flood event.

5.2.7 Conclusion

WaterNSW believes that it is premature for IPART to conclude that a variable charge should be *introduced, as an incentive* for WaterNSW to resolve the metering issues. As a bare minimum, WaterNSW should be given the opportunity to engage with all Lowbidgee customers (including the 18 potential direct customers) through its Levels of Service Program to identify and work through the issues with all Lowbidgee customers. Further, adequate billing arrangements should be agreed between customers before the introduction of any variable charge. WaterNSW had

discussed the Lowbidgee fixed charge with the Commonwealth Environmental Water Holder and no objections were raised[19].

Moreover, given the difficulties highlighted above in relation to levying a variable charge in a flood plain environment and the lack of data to make any accurate predictions on future water use in the Lowbidgee, WaterNSW submits that IPART should retain the fixed charge. The current arrangement of a fixed charge provides a fair balance between:

- ensuring stable bills for customers;
- ensuring that the cost of Lowbidgee are fairly allocated to customers who benefit from Lowbidgee supplementary flows; and
- aligning the tariff structure with WaterNSW predominately fixed cost base.

6. Irrigation Corporation and Districts (ICD) Discounts

6.1.1 Introduction

WaterNSW proposed a continuation of the ICD discounts using the same broad methodology that was adopted in previous price reviews, which resulted in a 50% reduction in the ICD discounts from the 2014 ACCC Final Decision compared to the 2017-2021 determination period. WaterNSW's proposed approach reduced the overall bill impact to non-ICD customers in the Lachlan, Murray, and the Murrumbidgee.

In its Draft Decision, IPART has accepted the methodology applied by WaterNSW in computing the ICD discounts, but has instead decided to use the number of customer outlets, as opposed to customer sites, as a cost driver to calculate telemetry and data transfer avoided cost. IPART's approach halves the reduction in the discount proposed by WaterNSW. WaterNSW observes that the approach adopted by IPART:

- tends to overestimate the ICD discount; and
- shifts additional cost burden onto non-ICD customers.

WaterNSW believes that the ICD discount should be recalculated based on customer numbers, or that the number and types of outlets reported to IPART by the ICD Corporations should be reviewed and applied correctly to ensure that avoided cost are appropriate quantified.

The reduction in the ICD discounts proposed by WaterNSW ensured that the cost efficiencies realised from the creation of WaterNSW are more evenly distributed across all customer groups, including ICD and non-ICD customers. For example, IPART noted in its Draft Report that there was a 47% reduction in metering and compliance cost from the 2014 ACCC Final Decision[20]. WaterNSW proposed a 39% reduction in discounts for the Murray Irrigation Corporation. However, IPART has proposed an 11% reduction in the discount for Murray Irrigation Corporation, despite a 47% reduction in WaterNSW's metering and compliance cost. A greater portion of the efficiencies are being passed onto ICDs through the ICD discount, instead of non-ICD customers.

Further, in section 16.1.2 of the WaterNSW Pricing Proposal, WaterNSW sets out its new risk based approach to meter reading. The restructure in the meter reading program was noted to reduce cost and provide savings to customers over the upcoming determination period.

As part of this new approach, WaterNSW promised its customers that it would explore a variety of innovative and cost effective methods for collecting water take data, including customer reads. Further, WaterNSW also flagged to its customers that that it would like to encourage customer

[19] The Commonwealth, being the largest holder in the valley, may wish to continue with a 100% fixed charge for the benefit of budgetary certainty.
[20] At page 161.

driven investment in metering and telemetry infrastructure, as a means to reduce the number of site visits and potential cost.

The improved meter reading program is one of the key drivers in the reduction of the metering and compliance budget, and the reduction of the ICD discount. WaterNSW is concerned that its efforts to reduce cost and send appropriate price signals as to the prudent and efficient cost of meter reading, is being distorted by the ICD discount. For example, ICDs are being rewarded for the reduction in the meter reading cost, as driven by the needs of WaterNSW's non-ICD customers. The structure of the ICD discount and the ICD's reliance on the discount should be further reviewed in the 2021 price review.

6.1.2 Customer outlets

WaterNSW has concerns over the application of the number of customer outlets as an input to calculate the telemetry and data transfer costs, which has greatly increased the quantum of the ICD discount.

According to IPART, the use of customer outlets to calculate the telemetry and data transfer costs would:

> *Reflect where WaterNSW would install telemetry if it serviced these individual customers*

IPART appears to have accepted the estimated number of outlets as advised by the ICDs. However, there is a lack of transparency in the data as well as the potential for unclear and inconsistent definitions adopted by multiple ICDs. It is therefore not apparent that customer outlets is a more appropriate cost driver than customer numbers, as per the previous price reviews. Further, the cost inputs into the ICD discount calculations were designed to calculate the avoided cost for each customer within the ICD, not for each outlet.

In some ICDs, the number of outlets appears to be significantly higher than the number of customers or properties serviced by the ICD Corporation. For example, according to the 2014 Murray Irrigation Strategy Plan, there are 2,400 properties within the Corporation, yet the data provided to IPART by Murray Irrigation states that there are 3,426 outlets (43% higher than the number of customers/properties). There is no clear or apparent explanation as to why this is the case.

It is noted that ICDs appear to have a large number of mechanical water measurement devices, such as the Dethridge Wheel. For example, the Murray Irrigation Network Service Plan identifies 728 large Dethridge outlets and 472 small half wheel Dethridge outlets. The Dethridge Wheel (as illustrated in Figure 7) does not appear to support telemetry and WaterNSW would not incur additional cost in relation to telemetry and data transfer.

Figure 7 – WaterNSW would not install a telemetry device on the Dethridge Wheel

Further:

- the IPART calculations assume that WaterNSW would purchase a separate mobile data plan to support more than one outlet on a customer property, as opposed to one mobile data plan. This approach effectively double counts the data transfer avoided costs[21];
- the application of customer outlets in computing the ICD discount does not take into account potential inefficiencies within the ICD Corporation. For example, where customer properties are being serviced by an inefficient number of outlets or inactive outlets. It is important that the discounts encourages efficient behavior by the ICD. The ICD discounts should not be used as a mechanism for non-ICD customers to cross subsidise potentially inefficient costs incurred by the ICDs.

WaterNSW believes that the ICD discounts should be recalculated based on customer numbers, or that the number and types of outlet reported to IPART by the ICDs should be reviewed and applied correctly to ensure the avoided cost is appropriately quantified.

7. Inter and Intra State Trade

WaterNSW is supportive of IPART's draft decision to levy usage charges on all customers trading water, irrespective of whether the water is trade inside or outside of NSW as set out at page 131 of the Draft Report.

IPART stated that usage fees payable by customers who trade their allocations should be referable to the best available information held by WaterNSW as to usage by a trade recipient:

- where WaterNSW has access to relevant metering information (both WaterNSW owned and customer owned meters) usage fees should be referable to the metered volume of water extracted;
- where such information is not reasonably available, usage fees should be calculated on WaterNSW best estimate of the volume of water extracted by that person –up to the amount of allocation transferred.

In our view, this is a better characterisation of the interstate trade issue which is, in substance, in relation to WaterNSW not having access to metering data outside of NSW. Unless information availability changes, then WaterNSW does not see that this characterisation will change the way that WaterNSW charges trade customers.

[21] The data transfer avoided costs were based on the cost of a data sim pack of $5 per month, as offered by Telstra. However, Telstra also offers customers the ability to use multiple sim cards for the one data plan.

8. MDBA/BRC Pass Through Charges

8.1 Method of collecting the pass through charge

In the Draft Report, IPART has proposed to:

- repay the balance of the MDBA/BRC UOM through customers prices
- discontinue the UOM for the Final Determination
- introduce an 80:20 fixed:variable tariff structure for the collection of the MDBA/BRC pass through charges.

In May 2014, WaterNSW was directed by the NSW Treasurer under section 59B(2) of the *Public Finance and Audit Act 1983 (NSW)* to remit certain amounts to the NSW Government in relation to NSW's contributions to the MDBA and BRC. IPART's draft decision as outlined in its Draft Report to require repayment of the balance of the MDBA/BRC UOM through customer charges reflects this requirement. That is, without repayment of the UOM, WaterNSW would be required to pay specific amounts to the NSW Government but not have received those amounts from customers and would have to have make up this shortfall. Therefore, WaterNSW strongly supports this outcome.

However, the draft decision of IPART to discontinue the UOM for the Final Determination and introduce an 80:20 fixed:variable tariff structure for the collection of the MDBA/BRC pass through charges puts WaterNSW at risk of funding a proportion of the "pass through" charges. This risk would materialise if WaterNSW receives a direction from NSW Government to pay specific amounts in relation to MDBA/BRC costs[22].

If WaterNSW does receive a direction from NSW Government, then IPART should change the pricing structure for MDBA/BRC pass through charges to 100% fixed charges (preferred) or to introduce a new UOM for the next determination period (fall-back). WaterNSW should not be expected to bear any shortfall between the fixed sum set out in a direction and the amounts that it collects from customers. WaterNSW is providing a billing service to the NSW Government and should not be caught in a bureaucratic vice between two instruments which make it subject to a non-commercial loss. IPART should have due regard to the principles regarding the proper operation of a State Owned Corporation in making its final decision.

WaterNSW's analysis shows that the proportion of the costs incurred by the MDBA to *build, maintain and improve* assets for which WaterNSW is the constructing authority, is significantly less than the revenue intended to be recovered as a pass through charge under the MDBA charges as requested by DPI Water. The additional costs could be the costs of the MDBA itself or of projects in other states. WaterNSW should not be expected to bear "business" risk for these costs which are outside of WaterNSW control and which are not part of its business. Again, WaterNSW is only providing a billing service for the NSW Government.

Table 3: Percentage of cost related to WaterNSW asset work as a proportion of MDBA pass through cost

NSW Asset	2017-18	2018-19	2019-20	2020-21
Total cost WaterNSW assets (user and government share)*	8,233	7,507	6,726	Data not available
Total MDBA pass through cost (user share)	17,939	13,564	12,858	12,685
% of WaterNSW asset to MDBA pass through cost	45%	55%	52%	N/A

[22] In the absence of a direction, WaterNSW would only pass through charges that it actually collects from customers.

*includes Water Assets in NSW such as Cat 1a Hume Dam (NSW Component), Cat 1b Euston lock 15, Cat 1b Menindee Lakes (75% of cost), Cat 2a Wentworth lock 10, and Koondrook (NSW share).

8.2 Ensuring further efficiency

We are supportive of ensuring that the MDBA/BRC costs passed through to customers are as efficient as possible. We are not adverse to the recommendations made by Aither as set out at page 78 of the Draft Report, noting that these recommendations echoed past reviews that MDBA is in the process of implementing[23].

Another way to solve this issue for customers is for the construction authorities to include the assets situated within their jurisdiction in their asset base. That way, the normal prudency and efficiency review of capital and operating expenditure in relation to those assets would occur through the normal pricing approval process by the relevant regulator, IPART within NSW. In our view, this would be the most transparent mechanism for proving prudency and efficiency and would be at lowest cost without additional significant impost on the constructing authority, the MDBA or the regulator. This would also ensure that those assets are subject to standard RAB pricing principles seeing customers contribute only to the return on and off assets rather than full contribution to capex as is currently the case with the existing methodology.

[23] Draft Report, page 77.

Attachment A

COVARIS

progress through knowledge engineering

WaterNSW – Review of Funding Submission and Feedback from Regulator

Version 5.4
April 2017

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Version Management

Title	Covaris Pty Ltd WaterNSW – Review of Funding Submission and Feedback from Regulator
Document Purpose	• Review WaterNSW Rural Pricing Proposal • Review AITHER report commissioned by IPART • Advisory on WaterNSW investment strategy
Key Words	Asset consumption, reliability, risk management, investment optimisation, pricing justification
Document Number	WaterNSW Review of Funding Submission and Regulator Feedback 170217 ver 5-4
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Issue No	Issue Date	Author(s)	Nature of Amendment
1-0	17/02/2017	R Platfoot	Document Establishment
2-0	23/02/2017	R Platfoot	Update of definition of efficiency; Treatment of the MDBA; Analysis of the recommended total cost down; Review of WaterNSW project formation and delivery
3-0, 3-1	27/02/2017	R Platfoot, J Mann	Update of WaterNSW artefacts Quality review
4-0	28/02/2017	R Platfoot	Final Issue of Report
5-0:5-4	04/04/2017	R Platfoot	Consideration of WaterNSW's response to Aither and minor updates

Approved:

Name	Approval Date	Signature
R A Platfoot	04/04/2017	

Executive Summary

WaterNSW has engaged Covaris Pty Ltd, a specialist asset management technical adviser, to provide an independent review of their 7/2017-6/2020 Rural Bulk Water Funding Submission plus feedback on this submission provided by the NSW Independent Pricing and Regulatory Tribunal (IPART). The purpose of the Covaris work was to determine where

WaterNSW could improve its asset investment management and the degree to which it could take up recommendations from the IPART commissioned review.
This report presents the findings from three tasks:

- Review of the asset consumption aspects and strategy for their remediation within the WaterNSW funding submission;
- Assessment of the Aither report commissioned by IPART; and
- Advice on:
    - Was the investment proposed in the original funding submission by WaterNSW reasonable and prudent;
    - The merit of Aither's feedback and recommendations; and
    - Alignment of the WaterNSW approach and requested level of investment with known leading practice across industry.

The key message with respect to each of these three tasks is as follows:

WaterNSW Pricing Proposal	• The WaterNSW Pricing Proposal was consistent and efficient in its pricing proposals per valley, with clear explanation of any costing exceptions. • The prudence of the Pricing Proposal was tested using the feedback from engaged customers who understood the service they received from WaterNSW. • Customers believed WaterNSW's proposals of work were conservative (ie too costly) whereas it may be demonstrated that the proposals are not necessarily conservative since remediation options (eg painting) are considered instead of asset replacement where appropriate. • WaterNSW would improve its proposal documentation by clearer explanation of options considered in the Risk Cost establishment of the lower bound of the investment portfolio. • Secondly, WaterNSW should demonstrate prudence in how the proposed work addresses the risk profile of each valley, showing that the work selected was the right work to proceed. The information to do so can be extracted from their asset information system.
Aither Report	• The Aither report is generous in its opinion of WaterNSW's processes and systems, noting some of the comments above. • Aither have recommended a 17% cost down in the capital plan which is made up of $21M by application of an average of 25.6% of asset renewal capital work per valley and $12.3M detailed review of selected projects. • Based on IPART research and feedback promulgated in 2010 and referred to in this document, IPART indicated that the review of selected projects may not be considered appropriate for an IPART review. • The cost down factor of 25.6% was established by Aither in response to WaterNSW's project performance in the 2014/17 period. This factor was challenged in this report since it is more than the 14.5% variance of approved work exhibited by WaterNSW in the same period.

It is concluded that there are several points on which WaterNSW may query the recommended reduction in the capital plan based on the need to manage risk in the assets. It is noted that WaterNSW needs to improve its communication of risk per valley based on detailed asset condition data collected as part of routine maintenance and held in its asset information system.
The process WaterNSW utilises to assess these risks and then propose optimal solutions is based on an optimal budget which lies between a simple upper bound (which is not used but applied for comparison) and a lower bound established using the well understood Risk Cost method. The lower bound estimate is not necessarily conservative (eg automatically replacing physical assets) but is a function of the solution proposed. This solution is determined from field workshops with local asset specialists familiar with the assets and may include remediation such as painting and repair as lower cost alternatives to replacement.

A benefit of the WaterNSW approach is that detailed risk profiles based on multi-variate criteria is determined from condition as well as functional appraisal. Such risk indices are essential to justify total spending per valley, both in the short and longer terms. This report contains examples of both the approach and the data held in WaterNSW asset information systems.

Adjustment due to Project Variance and Accounting for Valley-Based Risks

As noted in Section 3.3 of this report, Aither have applied an across the board reduction of 25.6% to the capitalised maintenance in all valleys. This number was determined by Aither based on their appreciation of the historical performance reported in the WaterNSW funding submission. On consideration, Covaris considered that the historical evidence suggested a more likely variance of 14.5% applied across the investment portfolio.
The risk profile for each valley was analysed based on data drawn from WaterNSW's AssetBank in 2016, which is data stated to have been available to Aither. There are some valleys with a preponderance of high risk work which we would recommend as unwise to impede. Hence even the 14.5% should not be applied unilaterally across all valleys.
A comparison of the recommended Aither reduction for the capital renewal of assets and a revision suggested by these consideration is provided below.

Valley	Proposed Expenditure	Aither Recommended Adjustment	Aither Revised Proposed Expenditure	Risk Profile	Covaris Recommended Adjustment	Covaris Revised Proposed Expenditure
Border	362	25.6	269	HIGH	0	362
Fish River	11628	25.6	8651	HIGH	0	11628
Gwydir	3046	25.6	2266		14.5	2604
Hunter	4823	25.6	3588	HIGH	0	4823
Lachlan	11056	25.6	8226		14.5	9453
Lowbidgee	6203	25.6	4615		14.5	5304
Macquarie	7398	25.6	5504	HIGH	0	7398
Murray	1647	25.6	1225		14.5	1408
Murrumbidgee	30135	25.6	22420		14.5	25765
Namoi	3533	25.6	2629	HIGH	0	3533
North Coast	836	25.6	622		14.5	715
Peel	723	25.6	538		14.5	618
South Coast	766	25.6	570		14.5	655
SUM	82156		61124.06			74266.26
Adjustment			(21032)			(7890)
% Reduction			25.6			9.6

The difference proposed in overall reductions is quite significant and that of the Covaris recommendation is a level of variance is in keeping with what WaterNSW claimed to have achieved in the past funding period, noting the current state of all work from that period is now completed.

R Platfoot

April 2017

Contents

1 Introduction

This report was commissioned by WaterNSW as an independent review of their Pricing Proposal to the Independent Pricing and Regulatory Tribunal (IPART) for NSW Rural Bulk Water Services July 2017 to June 2021, along with the Aither report commissioned by IPART, WaterNSW Rural Bulk Water Services Expenditure Review, December 2016.
The terms of this independent review are:

1. *Review WNSW Rural Pricing Proposal and arguments behind the Investment required to offset Asset consumption.*

2. *Review the Aither report commissioned by IPART and their arguments for a lower level of investment*

3. *Provide independent advice (via a report), based on a qualitative analysis (as opposed to a detailed engineering qualitative dissection of WNSW model and data), as to:*

    i. *whether the investment proposed by WNSW should be considered reasonable and prudent, and/or*

    ii. *whether Aither's view has merit and should be supported (i.e. it's reasonableness in light of the facts), or otherwise;*

    iii. *the extent to which WaterNSW's approach, and investment level requested is on any other basis consistent with industry best practice, precedent etc.*

This document is organised to address each of these three tasks. WaterNSW explicitly requested Covaris to be objective and comment on potential areas of improvement for the organisation. This work has sought to do so.
Hence, WaterNSW emphasised their intent that this exercise is one of continual improvement, where they use this work to improve the planning of their asset management portfolio, leading to a sound basis for future Pricing Proposals. Considerations were to be made of the following:

- In the development of the bottom-up justification of the funding requirements, has sufficient attention been paid to options analysis and specification of optimal work?

- What is a reasonable trade-off between up-front specification of projects over the funding period and the need to retain flexibility associated with savings made though the period and changing circumstances impacting asset utilisation and capability requirements?

- Have WaterNSW effectively communicated the risk associated with specific work or asset strategies not proceeding?

- Per asset class, has the case been made for adequate funding to optimise life cycle costs associated with asset protection schemes as well as early intervention to remediate damage which would other increase exponentially and so forth?

- Is there assurance that the funding requested within the period can be fully committed effectively to return the best possible life cycle costs of the assets worked on?

1.1 Consideration of IPART Requirements

The acceptability of WaterNSW's asset strategy resulting in the plans which underpin its Funding Submission are tested by IPART for prudence and efficiency. A 2010 IPART Research report[1] best defines these requirements:

Efficiency – assess whether the business' part and forecast CapEx represents the best way of meeting the community's need for the relevant services.

Prudence – assess whether, in the circumstances existing at the time, the past decisions to invest in an asset were the ones that a similar business, acting prudently, would be expected to make. This test covers both how the decision was made and how the investment was executed.

These tests reflect competent asset management decision making and may be interpreted in a technical implementation sense as shown on the following diagram. Efficiency is achieved as the potential portfolio of work on the assets considers stakeholder needs plus contingency planning and the state of asset health. Because the term efficiency specifically refers to the investment, it also has a requirement that the expenditure is optimal.
Prudence is demonstrated when scheduling the right projects to proceed and ensuring that they are scoped and delivered effectively.
The levels of elements considered in the diagram below are consistent with ISO 55001:2014, to which WaterNSW is now accredited.

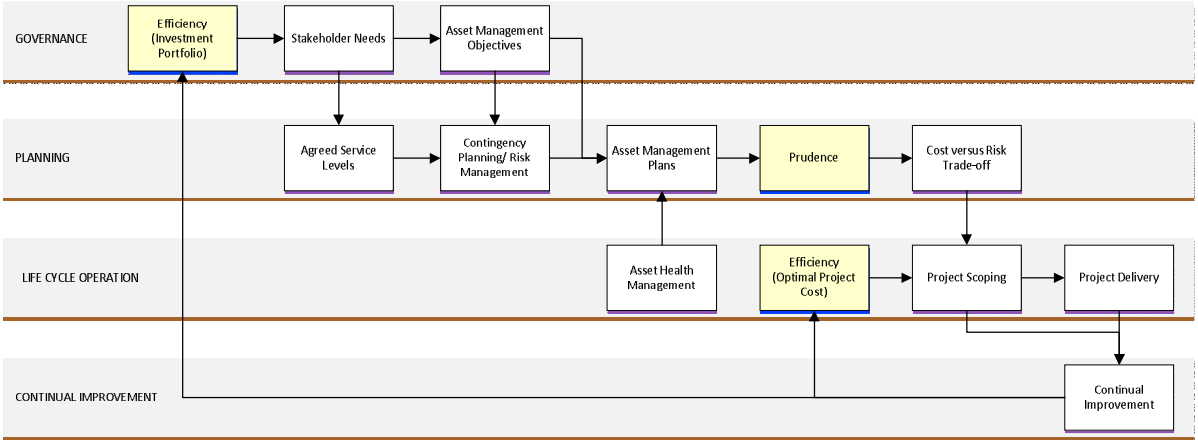


Figure 1Technical Interpretation of Efficiency and Prudence

The framework shown as a technical interpretation of Efficiency and Prudence allows us to test the Funding Submission as to its completeness and thoroughness in covering the aspects of developing and then executing the capital portfolio. Note that Efficiency has been split between the overall investment portfolio management and the individual project cost optimisation. The link between the two is that the roll-up overall cost of the portfolio is the sum of individual project costs.
Before progressing to the review of the actual Funding Submission, there is one further aspect to consider regarding IPART's requirements: that of how IPART believe that Efficiency and Prudence should be tested. The IPART guidelines for the specification of requested capital are listed below:
Drivers of, and justifications for, capital expenditure, activities to be carried out and outcomes to be achieved (eg, has there been an increase in standards?).

- *How the agency's forecast capital expenditure relates to service or activity levels, and the drivers of, or justification for, these service or activity levels.*

- *The main drivers (justifications) for capital expenditure in each program area (eg, water sources, water treatment, water distribution, wastewater transport, wastewater treatment, recycled water and stormwater drainage).*

[1] IPART, Regulatory Tests of Past and Forecast Capital Expenditure, Research – Final Report, December 2010.

- *Specific major projects should be clearly substantiated with links to drivers for the project, explanation of how options analysis was undertaken and the overall basis for its cost estimate.*

- *An appendix table listing all major projects, a link to the justifications discussed in the submission, an indication of delivery certainty and the basis for cost estimates.*

These four items correspond to stakeholder needs/agreed service levels, justification of work proposed in the asset management plan (meeting top level objectives or contingencies), how projects are prudently scoped and finally, how projects are prudently delivered. We therefore see Efficiency as a lead indicator to drive the optimal investment portfolio, and evidence of Prudence as a lag indicator that the agency has the processes in place to specify, plan and deliver work which is the optimal way to resolve asset-related issues.
These considerations were then applied to the 2010 IPART Building Block Approach, quoted in the IPART Research report[2]. The purpose in doing this was to bring out further detail on specific criteria which the WaterNSW Funding Submission had to meet.
This approach formed the basis of assessing the WaterNSW Funding Submission.

[2] ibid, Figure 1

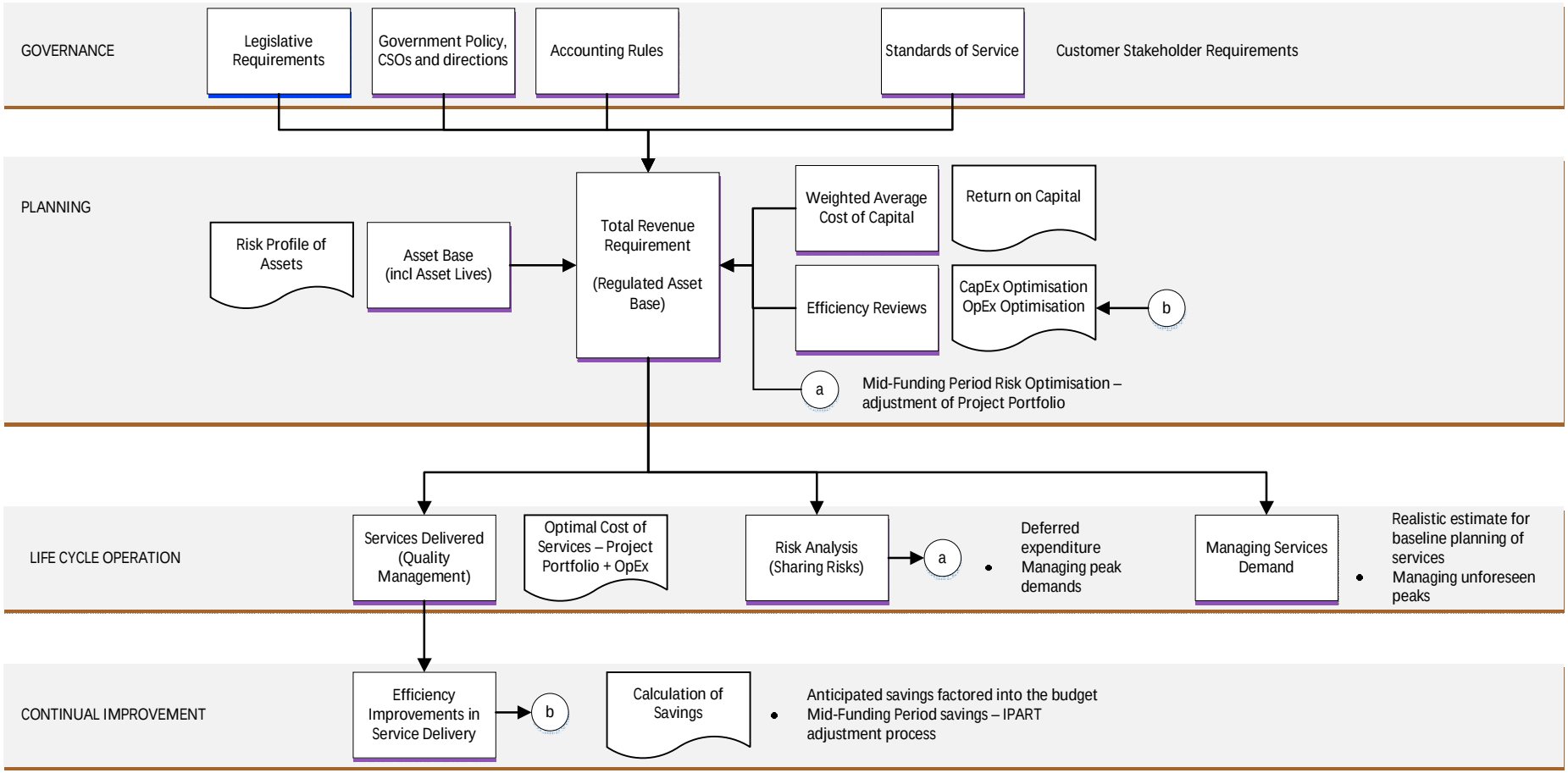


Figure 2Criteria for Success in Meeting IPART Regulation

2 WaterNSW 2017/2021 Rural Pricing Proposal

The following documents were reviewed as part of the assessment of the Pricing Proposal:

1. WaterNSW, Pricing Proposal to the Independent Pricing and Regulatory Tribunal, Regulated Process for NSW Rural Bulk Water Services from 1 July 2017 to 30 June 2021, June 2016.
2. ibid, Appendices
3. IPART, Review of Prices for WaterNSW, Rural Bulk Water Services from 1 July 2017, Water-Issues Paper September 2016.
4. IPART, Public Forum – Review of Prices for WaterNSW Rural Bulk Water Services, Sydney, November 2016.
5. IPART, Public Forum – Review of Prices for WaterNSW Rural Bulk Water Services, Moree, October 2016.
6. IPART, Public Forum – Review of Prices for WaterNSW Rural Bulk Water Services, Coleambally, November 2016.
7. WaterNSW, WaterNSW comments on the Aither Draft Report, November 2016

References 3 through 6 were considered as supplementary material to confirm considerations provided in the Pricing Proposal which is formed by references 1 and 2.

2.1 Understanding the Funding Submission

The WaterNSW Funding Submission has 20 sections. Those relevant to the planning of capital works are commented on below.

<table>
<tr><th colspan="2">Section</th><th>Notes</th></tr>
<tr><td>7</td><td>Proposed bulk water services charges

Tables are provided for changes in HS, GS and variable charges plus other costs to customers per valley.</td><td>The variation in costs should have some correlation with service levels and proposed forward work to meet these service levels.
Hence the table in Note 1. The focus here has been utilisation compared to level of investment and then commentary on the other driver of investment which is asset condition.</td></tr>
<tr><td>9</td><td>Our revenue requirements for bulk water services

• The revenue requirements are developed using the building block process.
• The revenue is smoothed during the determination period to provide price stability for the customers.
• The total revenue requirement is $350.4M for the four-year period. The percentage composition includes:

<table><tr><td>Operating and maintenance</td><td>44</td></tr></table></td><td>The funds requested per valley were analysed compared to previous comments on utilisation of allocations per valley. Refer Note 2.
A profile is starting to form of expectations of asset renewal per valley and comparative levels of deterioration which would be measured by asset health indices.</td></tr>
</table>

Section		Notes
	Return of capital (depreciation) 19 Return on capital 33 Tax allowance 2 UOM allowance 1 ICD Rebate 1	
13	**Proposed capital expenditure** Gross capital expenditure for the rural valleys and Fish River Scheme of $193.7M over the determination period. WaterNSW is seeking approval for the overall expenditure and not for specific projects. High level total capital expenditures are reported per the drivers for capital works. The categories are not aligned with the building blocks set out in Section 10. Note 4 comments on the alignment of capital spending per water utilisation in the valleys. 60% of the capital plan is addressing maintaining capability. 25% addresses regulatory compliance and 14% represents augmenting capability (which are largely comprised of 4 IT projects). Regulatory compliance is concerned with health and safety issues including dam safety, and a large proportion (44%) of this expenditure is allocated to the Keepit Dam project, which is also heavily subsidised by the NSW Government. Putting aside the large five projects which make up augmenting capability and regulatory compliance, the burden of the requested capital expenditure is the 60% committed to maintaining capability. Maintaining capability has three criteria: • Assets likely to exceed their service life; • Assets likely to approach their service life; and • Assets with risks greater than the tolerable level set by corporate guidelines. Three measures of annual investment to address maintaining capability have been proposed: • Annual rate of Consumption – the upper bound of annual investment • Current Average Annual ACCC Allowance – the lower bound of annual investment • Proposed Investment – the WaterNSW modelled level of investment **Efficiency** The WaterNSW determination of a lower bound of investment based on the Asset Risk Cost is proposed as an efficient method to set the total investment portfolio at the lowest reasonable level. The upper bound specified by WaterNSW is purely for comparative purposes. While the magnitude of the outer bound has been challenged, this is meaningless since the proposed investment will settle on the lower bound. Reference Note 5. The strategic drivers of the investment portfolio have been right set with a focus on maintaining capability and additional work associated with health and safety or	Refer Note 3 for a comment on the need for IPART to review individual projects. The interpretation of IPART requirements specifies the following material is needed: • A risk prioritised asset management plan of proposed work on the asset portfolio; • Methodology and data to support asset health assessment and work prioritisation; and • Sample capital works which can be assessed for efficiency. While WaterNSW has stated they have formed the capital Investment plan within the Pricing Proposal in accordance with IPART's building blocks, they have not shown the alignment of their internal classification with IPART's building block components. The Annual Rate of Consumption may be challenged using standard reliability mathematics and is discussed in Note 5 below. It is conceivable that this proposed investment level can be reduced by 19-25% depending on the age profile of the dams, reducing the outer bound of efficient investment. While customer levels of service have been discussed earlier in this report, it is noted that WaterNSW will not introduce these until 2021. This impacts the credibility of project selection (ie efficiency). Having said this, WaterNSW have compiled extensive customer consultation feedback and continue customer engagement through the CSCs. This intelligence needs to be formalised into agreements which formalise service levels. The submission did not provide examples of how WaterNSW conducts the following methods which would enhance understanding of how investments are managed prudently and efficiently: • Options analysis for specific projects; and • Efficient project delivery within budget, on time and meeting customer expectations. This analysis sought to understand the top-level strategy for how the valleys should be viewed in terms of the funding which has been sought. Evidence to underpin this analysis is obviously the

Section		Notes
	capability augmentation. Life cycle cost optimisation has been factored into the Capital Investment Plan, eg management of surface coatings. It is proposed to implement customer levels of service framework. **Prudence** WaterNSW specifies its approach as prudent insofar: Business cases are utilised to justify in detail commitment of actual expenditure based on options analysis. The project delivery method is professional and meets leading practice. WaterNSW are establishing a panel of competent service delivery organisations who will deliver the work at best possible price with lowest practical risk.	asset health profiles which have not been mentioned at this stage of the submission, except to say that they exist. These considerations would have significantly improved the submission insofar they would demonstrate how investments were identified as necessary in the first place (ie on a risk basis) and then how the WaterNSW planning process considered the options which were detected in their Asset Bank register.
14	**Proposed operating expenditure** • OpEx proposed to be $154.9M for the determination period. The maintenance component is estimated to be 57% based on the 2015-16 cost breakdown ($88.29M) • This equates to 2.0% of the replacement cost of the assets ($4.4B). • The total OpEx represents a 20% saving on current expenditure. The maintenance cost breakdown per valley was provided – reference Note 6 below.	WaterNSW seek OpEx funding which was calculated to be on average 2.0% of asset replacement cost. This assessment combined the OpEx data with the mean costs to replace the asset portfolio provided elsewhere in the submission. The proportionate spend is within general industry guidelines of 1-5-2.5%. In general, the OpEx requested was in line with expectations based on the asset portfolio size benchmarked across the valleys. The one notable exception was the Murray valley which has lower requirements compared to other valleys, given cross subsidisation from other states
18	**Our performance in the 2014-2017 period** Improvements noted in customer service. WaterNSW did not spend the full capital expenditure allowance in the MDB valleys provided for in the ACCC 2014 Decision. Only 82% of the approved expenditure was made. This was due to: Project delays and phasing. Inadequate funds for the full Capital Investment Plan leading to delays in resetting the plan. Substitute projects of $30.3M, which is 31% of the actual project spend. Asset-related variances in the previous determination period were: Dam safety: -38% Renewals and replacements: -11%	Past performance is a measure of prudence exhibited by WaterNSW. Past performance indicated the need to handle 31% variance due to substitute projects within the 4-year determination period, justified based on revised risk plus customer engagement. Changes in scope represented a 0.3% variance in the Capital Investment Plan. This is a very low percentage reflecting detailed planning taking place within the determination period being accurate and comprehensive. Overs and unders analysis of the capital project portfolio ended up with a total of $2.4M in savings which is 2.5% of the total capital outlay. Hence the biggest source of change in the Capital Investment Plan apart from resetting the portfolio (strategic deferrals and cancellations) is the switching to substitute projects.

Table 1 Analysis of WaterNSW Pricing Proposal – Asset Management considerations

2.1.1 Note 1 Proposed Charges/Valleys

Charges for the Lowbidgee Valley were excepted from the table since no correlation was attempted with service levels for this valley. Fish River Scheme was also excised since this

scheme is also subject to special treatment and has been adjusted in the aftermath of the closure of Wallerawang.
The purpose of the table below is to act as a prompt to track where proposed new capital works is planned to lift the capability and condition of existing assets and thereby reduce risk and ensure reliable supply as per the service levels.
The statistics in the table are:

- GS and HS Fixed Charge+ Variable Usage Charge – percentage increases in the 2017/2021 period
- General Security/High Security– water allocations in ML
- Rolling 20-year Average – historical consumption in ML
- %Average/Total – Rolling 20-year Average/(GS and HS Allocations) – indicator of utilisation
- Adjusted Total Increase – $\sum(Water\ Allocation * Fixed\ Change) / \sum Water\ Allocation$ – indicator of investment increase/decrease

Valley	GS Fixed Charge	HS Fixed Charge	Variable Usage Charge	General Security (ML)	High Security (ML)	Rolling 20-year Average (ML)	%Average/ Total	%Adjusted Total Increase	Notes
Border	-3	-17.8	-14	262238	3122	147829	56	-3	
Gwydir	21.2	-5.1	-5.6	511609	26840	264774	49	20	
Peel	26.3	-37.7	1.3	30428	17367	11291	24	3	
Namoi	17.8	-4.4	-6.7	256212	8874	168133	63	17	
Lachlan	24.8	-7.9	-9.6	633256	57514	205079	30	22	
Macquarie	2.3	-20.8	-22.8	632466	42707	258621	38	1	
Murray	3.3	-13	-12.8	2081716	261883	1537145	66	1	
Murrumbidgee	11.1	-3.3	-3.8	2267963	438331	1743637	64	9	
Hunter	-15.2	-18.3	-10.3	138109	70408	123211	59	-16	
North Coast	10	10	10	9681	137	619	6	10	Still not achieving full cost recovery and part funding by CSO subsidies
South Coast	10	10	10	13946	1175	3781	25	10	Still not achieving full cost recovery and part funding by CSO subsidies

Table 2 Proposed Pricing Changes

Where the %Average/Total is high, it is presumed that the funding requested may be under stress since in any given year the consumption may drop well below the allocation (eg drought). Where the %Adjusted Total Increase is high then there must be a demonstrable increase in the investment planned for that valley which is justified on asset health or utilisation grounds.
It was noted that there was little correlation between the two statistics which indicate investment change and utilisation.

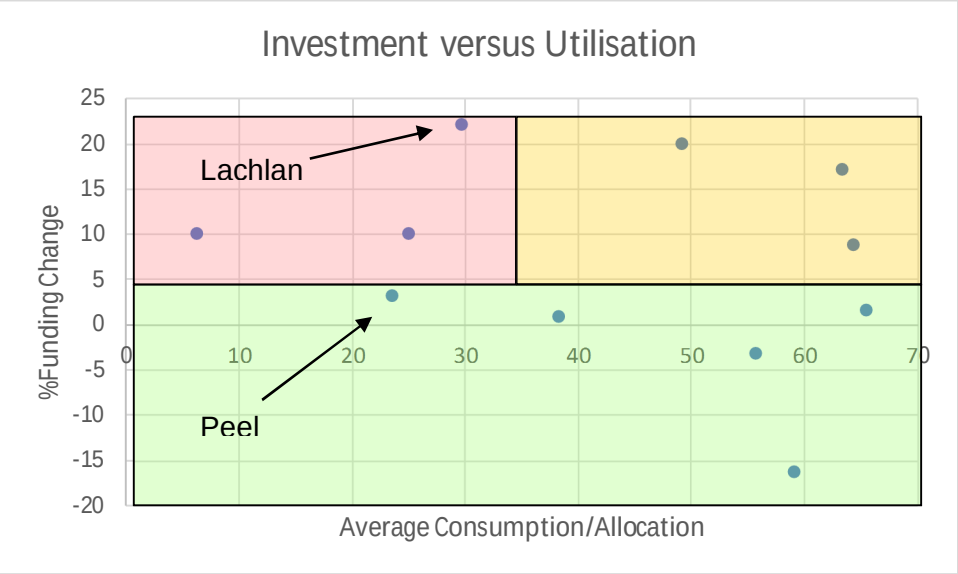


Figure 3Investment versus Utilisation

This indicates that the asset health drivers associated with the planned investment are more a function of current deterioration than utilisation. For the customers, this can mean even though their consumption can be low, they will be paying for a renewal of the water assets in their valley. Presumably the message related to risk due to deteriorated assets is made clear by WaterNSW in such cases.
Three sets of valleys are identified:

Red	Low utilisation but increase in investment	• North Coast • South Coast • Lachlan
Amber	High utilisation and increase in investment	• Gwydir • Namoi • Murrumbidgee
Green	High utilisation and marginal increase/reduction in investment	• Peel • Macquarie • Murray • Border • Hunter

Table 3 Investment Strategy per Valleys

Notes on this table include:

- The renewal of assets in Peel and particularly Lachlan will need to be well justified to the customers who do not fully consume their allocation. The condition of Lachlan should be carefully explained in terms of risk since it looks like this valley has a significant deficit in its condition despite its low level of utilisation.

- The justification of the investment for Gwydir, Namoi and Murrumbidgee will also need to be well justified based on condition and risk, even though the customers are more likely to use their allocation. The deterioration of these assets is expected to be higher than would be reasonable if there was no past maintenance deficit. It is of concern that Murrumbidgee is included in this set given its size.

- The investment sought for the valleys in the green region is less stringent, and is more likely to address a reasonable level of deterioration.

2.1.2 Note 2 Required Funds

The previous statistic determined for utilisation of water allocations was compared to the average request for funding per valley.

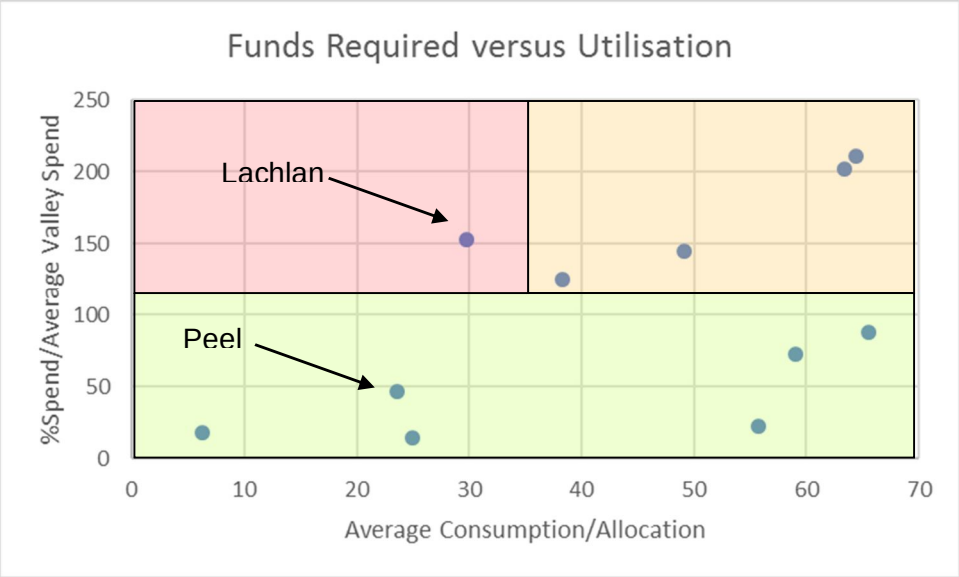


Figure 4Funds Required versus Utilisation

The valleys in the green range above have a low level of expenditure sought for their support. These include South Coast, North Coast, Border, Peel, Hunter and Murray in terms of increasing expenditure. Of these, only Peel has been the subject of a noted increase in request for revenue. Peel's expenditure was also requested to increase significantly, but the total level of spend is still much smaller than that required for other valleys. Hence while deterioration of assets in Peel are a concern, the total amount of work is not as high as in other valleys.

The valleys Macquarie, Gwydir, Namoi and Murrumbidgee required significant expenditure and these valleys exhibit a higher level of utilisation. This repeats the requirement noted above in Note 3 that evidence of significant deterioration will be needed for these specific valleys to justify their revenue estimation.

The Lachlan valley is in the red zone of the above table. In Note 3 the Lachlan valley was highlighted as having a lower level of utilisation but was the subject of a significant increase in request for funding. The Lachlan valley has one of the lowest levels of utilisation due to recent drought. The basis for any significant investment should consider an expectation of higher utilisation in this valley outside drought conditions.

2.1.3 Note 3 Reviewing Overall Expenditure versus Specific Projects

The 2010 IPART Research Report on regulatory tests of capital expenditure[26] noted that IPART as well as some professional advisers did not believe that consultants could find whether specific projects are efficient or prudent. Instead it is required that a sample set of projects could be assessed to test the efficiency of the approach to be adopted by the regulated party, eg WaterNSW.

Hence the process to establish if the capital programme is efficient and prudent will analyse a sample set of projects, but there is no requirement that all projects forecast for the determination period must be analysed. What is required is that the business ensures "… a high level of rigour around the forecasts and submissions they provide for capex assessments …"

[26] ibid, Section 4.3

Part of the information requirements is the asset management plan. Following WaterNSW's ISO 55001 certification, it has been established that in this case, the asset management plan is an enhanced view of the capital programme forecast from AssetBank. This has meant a bottom up view of:

- All items of work are linked to assets in WaterNSW's asset portfolio;
- Requirements for asset renewal are based on health metrics and are risk ranked;
- Estimates of remedial work are priced and a schedule estimated.

Supplementary information per entry in the asset management plan is sparse and WaterNSW should consider improvement in enhancing this kind of explanatory detail in the asset management plan.
Finally, in addition to the submission of the asset management plan, WaterNSW are obliged to provide a sample set of capital work proposals for review in order to test efficiency. This would be ascertained from the credibility and relevance of their business case.

2.1.4 Note 4 Percentage Capital Requirement

The percentage of total funds requested which is required for capital works was plotted per valley against utilisation. Again, the Fish River Scheme was left out of the analysis due to its specific funding requirements.

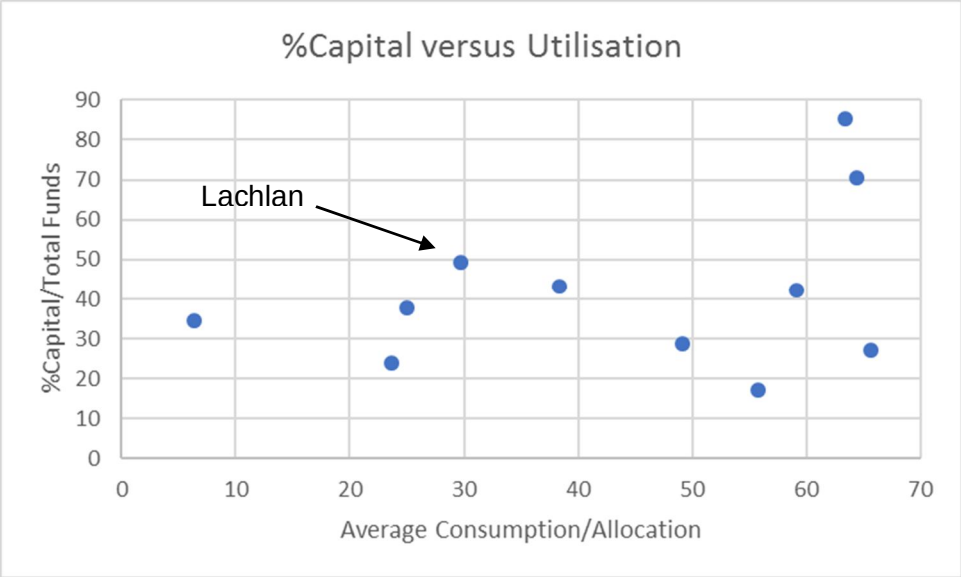


Figure 5% Capital versus Utilisation

Most valleys required between 20 and 40% of their total funding to be allocated to capital works. Two valleys, Murrumbidgee and Namoi, required the bulk of their funding to be allocated to capital works. Of interest, Lachlan was the next highest at 50%. Murrumbidgee is a valley with the highest water consumption and it is obviously an asset base of some concern, requiring extensive remedial work.
What is of interest in the plot above is that the two out of the top three valleys in terms of utilisation required significant capital improvement. The Murray valley has the highest utilisation and the second highest water consumption, but its capital requirements at $6.88M for the determination period are low due to costs being shared with other states through the MDBA.
It should be noted that the Namoi valley includes the Keepit Dam and there is a special project in place for the $35.12M Keepit Dam Safety Upgrade. The NSW Government is making a substantial allocation to this project but customer funds are also being applied.

2.1.5 Note 5 Annual Rate of Consumption

The calculation of Annual Rate of Consumption is based on a linear distribution through the life of an asset which presumes straight line deterioration. it is more customary to use an exponential distribution as shown below. In this case, we have used a two parameter Weibull distribution with various shape factors: 1 is random failure and 2 is wear out.

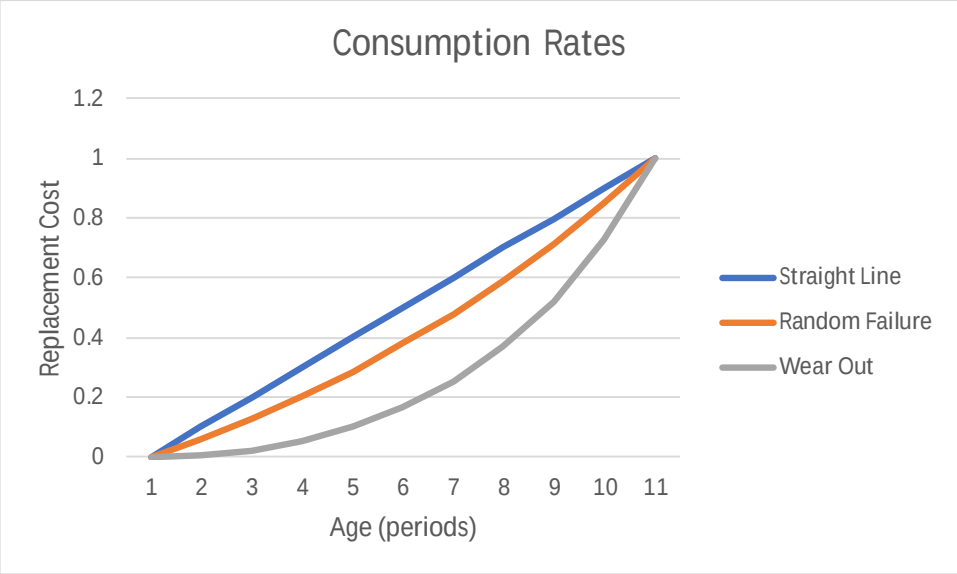


Figure 6Possible Consumption Rate Models

Some average age data was published earlier in the submission, lying between 20 and 100 years. Applying the random failure curve to the annual rate of consumption effort represents a correction down between 19-25% depending on the age profile of the fleet. If the so-called wear out function was used, then the correction down would be extreme, down to between 52 and 66% of the straight-line assumption. It is unlikely this would apply to mechanical/electrical assets since these deteriorate quickly when under maintenance and through being operated. But it may apply to some large civil structures which remain largely untouched.

If assets required renewal early in their expected service life, then the straight-line estimate would need to be increased by between 20 and 29%. While this would not happen to the full asset portfolio, it is possible that some asset classes are subject to infant mortality.

At this stage, we would recommend that the random failure hypothesis be applied which means the annual rate of consumption can be expected to be between 19 and 25% less than the straight-line estimate. Based on Figure 19 in the submission, this would represent an outer bound for annual investment of $33-35.6M for the portfolio. This should represent a reasonable estimate of the expected investment which in Figure 19 in the submission is reported to be $29M.

What the outer bound figure means is that the service life deterioration is modelled using a random failure Weibull distribution which equates to a Poisson distribution. If no other detailed modelling was applied, this would represent a reasonable basis for assessing asset renewal.

2.1.6 Note 6 OpEx Analysis

The proportionate spend on maintenance and capital per valley was compared by reporting normalised statistics. These were calculated as Requested Spend (either OpEx or Capital work) divided by the average (either OpEx or Capital work) calculated across all valleys. If both the total maintenance and the total capital expenditure is largely a result of the number of assets in each valley, then a straight-line correlation should be self-evident. In any case, we expect the total maintenance requirement to certainly be a function of the size of the asset portfolio. Hence this test is a sensitivity check of the capital request related to the asset portfolio for each valley.

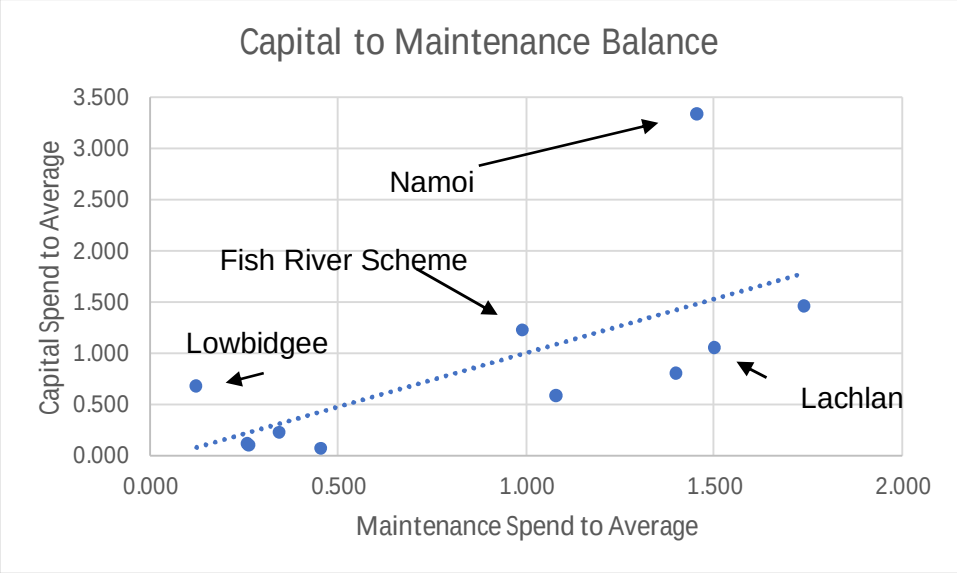


Figure 7 Capital to Maintenance Balance

There are three exceptions to the straight-line correlation where the capital outlay is higher than the straight-line correlation. Of these Namoi is the most significant exception. Namoi has been reported as having a proportionately high utilisation and a need for increased investment. What these figures are suggesting here is that the Namoi investment is higher than would be suggested simply by the size of its asset portfolio. The capital requirements for both Lowbidgee and Fish River Scheme have been driven by different requirements than the other valleys due to the operational strategies of these schemes. It is therefore challenging to comment on the efficiency of these requests simply through comparison with the other valleys.

The Lachlan valley has been raised as an issue in previous charts above, hence it was highlighted above. Its OpEx cost is slightly high compared to its water utilisation (refer to the figure below). Even though it is also observing the straight-line behaviour of the other valleys, both its OpEx and CapEx costs are comparatively high. In this case, it is possible that the maintenance is higher due to expectations of deteriorated assets.

The OpEx spend as a function of valley water consumption is reported below.

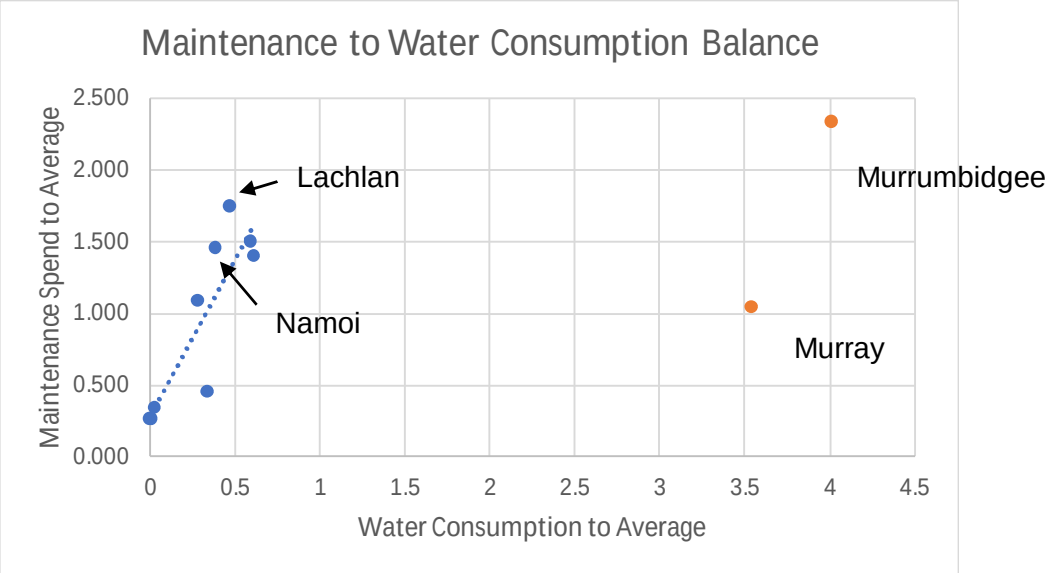


Figure 8 Maintenance to Water Consumption Balance

The two large valleys in terms of water consumption clearly lie outside the straight-line relationship exhibited for the other valleys. The Murray valley figures are distorted since WaterNSW do not cover all the costs for this valley.

The Namoi valley is highlighted and the OpEx spend is in line with the straight-line behaviour for water consumption. Hence the high CapEx reported above for this valley is a function of targeted asset renewal but the maintenance has not been increased in response to any advanced deterioration. In other words, deteriorated assets will be replaced and not receive additional provision for corrective maintenance.
The Lachlan valley is also highlighted. This valley is an outlier on the straight-line relationship but not significantly so. Hence maintenance is expected to be slightly higher but nothing which seems extraordinary.

2.2 Efficiency of the WaterNSW Strategy

Concerning the data in Notes 1 to 6, the WaterNSW funding requirements can be internally benchmarked on both a water consumption and an OpEx basis where the OpEx reflects the size of the asset portfolio of a valley. Taking all this into account, the efficiency of the WaterNSW strategy is then assessed as:

- The Murrumbidgee valley is a large system which correspondingly needs significant CapEx and OpEx to maintain services.

- While the Murray valley is also a large system, its requirements for both CapEx and OpEx are defrayed by other Government funding through the Murray-Darling Basin Authority. Hence WaterNSW funding requests do not cover all the work undertaken on these assets.

- The Namoi valley needs a significant capital injection, should this funding period be used to address deteriorated structures and equipment. The Namoi valley includes the Keepit dam which is the subject of major remedial work, some of which is co-funded by the NSW Government.

- The Lachlan valley also needs significant capital compared to its level and utilisation of water consumption. Having said this, the Lachlan valley has been severely impacted by drought so that its water consumption rates are depressed. The utilisation for the Lachlan was calculated to be 30% of the water allocation which compares to a median value across the valleys of 49%. It may be arguable that its asset base needs significant funding either due to standby deterioration, environmental degradation or preparation for higher utilisation.

- The requested funding for the Fish River Scheme is not readily benchmarked against the other valleys, but its requirements are not exceptionally high when benchmarked by its maintenance requirements. What this means is that if the maintenance expenditure is relatively consistent for assets across WaterNSW, then the expenditure on both CapEx and OpEx for this scheme is roughly aligned with the requirements of other rural valleys.

- The Lowbidgee scheme has a slightly higher level of CapEx requested when baselined by its OpEx requirements, but the total spend is much smaller than for other rural valleys.

These considerations need to be justified based on what is known about the asset health in these valleys. Ideally this information should be included in the valley-specific summary sheets contained in the Appendix to the submission. Unfortunately, they were not.

2.2.1 Comment from IPART Invitation for Submissions

IPART released an invitation for submissions[27] which commented:

IPART Comment	Notes from this Study
The lower overall cost of WaterNSW's proposal is driven by reductions in operational expenditure and lower return on capital.	The OpEx was tolerated to reduce through both efficiencies plus realisation of asset improvement benefits from the increased CapEx programme. It is not clear that the conjunction of the OpEx and CapEx strategies has been recognised by IPART. As WaterNSW renews and sets up the assets for the longer term, the life cycle costs will fall as reflected by lower OpEx costs.
The proposed total capital expenditure is higher than allowed in current determinations.	Total increase is $76.5M over the 2014/2017 period of $117.2M (ACCC Regulatory Allowance) leading to a proposed $193.7M for 2017/2021.[28] The difference is an increase from $39.07M per annum to $48.4M per annum which is a 24% increase. The user part share statement in Section 6.2.2 of the IPART document is claimed to increase by 163.7% in the user share in the 2017/21 period. It was noted in Tables 103 and 104 of the WaterNSW submission the balance of user share for capital expenditure was 40%. In 2017/2021 this increases to 77%. If the original balance of user/government share of 40% was retained, then the user share increase would be 65%.

Table 4 Notes on IPART Invitation for Submissions

There are some anomalies between our reading of the submission and IPART's but these are not substantive. The IPART comments relate to the top-level view of the WaterNSW strategy set out in Section 2.3.

Of interest is the drop in the Government cost share of the capital works. IPART noted[29] that the Government share has decreased as capital work moved away from dam safety and fish passages to asset renewal. This is a substantial driver of increases to the costs of the users who are being required to fund the life cycle renewal of the assets which provide them with the water services.

2.2.2 Comment on Asset Health across the Rural Valleys

Probably the greatest deficiency in the WaterNSW submission is that it continually referred to asset health being a key driver of the capital program requirements, but did not communicate the trends across the valleys. The strategic basis of the WaterNSW proposal is that increased capital spending is needed to address deterioration, in part brought about by underfunding in the past. This message was implicit in Figures 19 and 20 of the submission.

A view of the asset health is reported below based on an analysis of data from the AssetBank system.

[27] IPART, Review of prices for WaterNSW, Rural bulk water services from 1 July 2017, Water – Issues Paper, September 2016.

[28] Note that the WaterNSW submission did not include details of the 2013/2014 capital expenditure.

[29] ibid, Section C.3

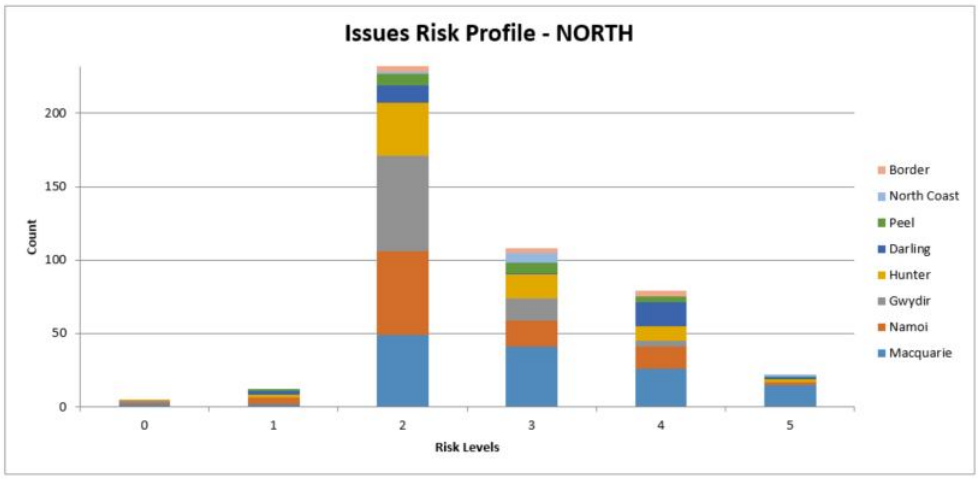
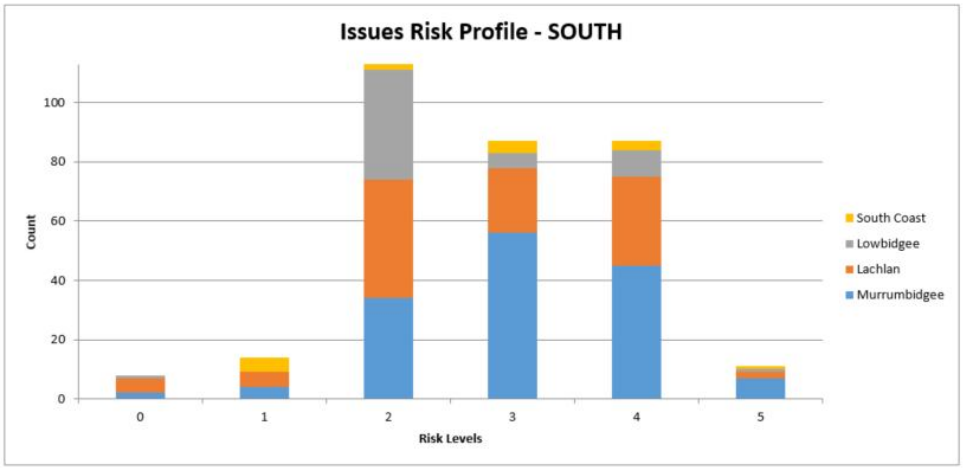
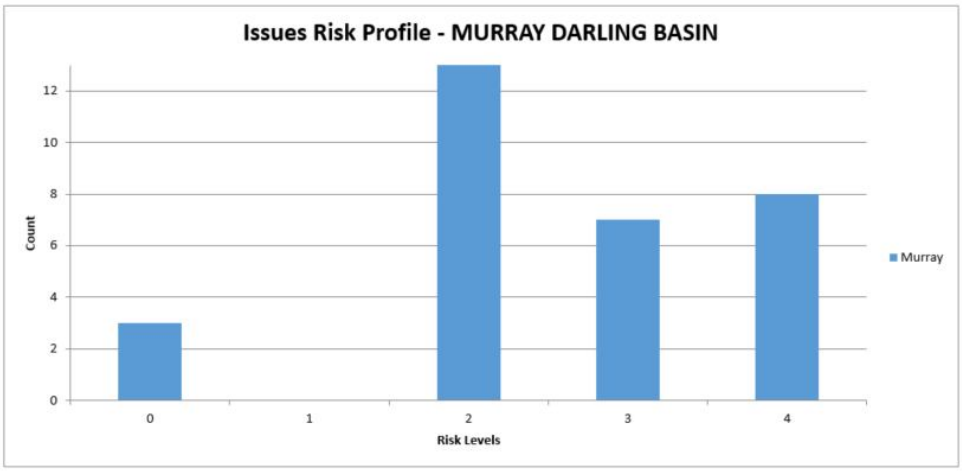
Northern valleys	
Southern valleys	
MDB	
Fish River Scheme	No credible data available to the author

Figure 9 Distribution of Asset Risk

Valleys of interest with frequency as well as high risk issues included Macquarie, Namoi, Murrumbidgee and Lachlan, and then to a lesser extent the Gwydir and the Murray valleys. These trends in the known risks correlate well with the high-level strategy set out in Section 2.3, supporting the efficiency of the WaterNSW capital strategy in identifying the right mix of work for the forward plan.

2.3 Prudence of the WaterNSW Strategy

Prudence is defined as "… whether, in the circumstances existing at the time, the past decisions to invest in an asset were ones that a similar business, acting prudently, would be expected to make.[30]" The test applies to both how a decision is made and how the investment is executed.
The prudence of WaterNSW was tested referring to feedback from the customers in the three IPART forums conducted as part of the Pricing Proposal. These are documented below.

2.3.1 IPART Public Hearings

In the IPART public hearings conducted in Sydney 8 November 2016 it was noted that:

- A reduced operating expenditure of 20% in the new determination period over that required for the current period reflected WaterNSW's focus on efficiency gains and alignment with customer requirements.
- Two issues with the capital programme were considered: assuring assets were well maintained and ensuring proposed capital works proceed as planned. These are being addressed by:
    - Strategic procurement; and
    - Reprioritisation of projects based on current needs, assessed on an annual basis including customer feedback.
- Customer concerns included:
    - State Water's past track record in not being able to spend its capital budget leading to the current concern that assets have deteriorated.
    - The proposed balance in OpEx to CapEx, particularly regarding dam safety, where the revised Dams Safety Act apparently introduces further options other than "pure capital expenditure".
    - Irrigator's Council has concerns with the use of MEERA and potentially less transparency (presumably with respect to options analysis) in the capital program. Specifically, large capital projects should be planned and documented leading up to the four-year determination period.
    - The issue of presenting large projects to the customers in detail before they commence was reinforced for the North and South Coasts. They have a specific issue of not requiring their full allocation. (Covaris Note: the utilisation for North Coast was 6% and that for South Coast was 25%. The median utilisation is 49%.)
    - There is concern that user shares have increased and these are in part covering environmental flows which would more properly be covered by a government share.

[30] IPART, Regulatory Tests of Past and Forecast Capital Expenditure, Research – Final Report, December 2010. Section 2.1

2.3.2 Consideration of Evidence of WaterNSW Prudence

The comments in previous section go the heart of what is prudent in the management of the assets. Consideration should be given to:

1. Prudent capital works specification

    a) Business cases are required to consider options for the optimal specification and budget of capital works.

    b) Based on the comments within the forums, it is possible that the MEERA concept has not been fully understood by the wider community. For example, the replacement of a protective coating has an optimal time before damage to the underlying steelwork initiates. In this case, the MEERA analysis is the capitalised maintenance associated with renewing the paint scheme. The application of MEERA does not mean waiting until replacing the steelwork.

    c) It is reasonable to anticipate that projects with a planning horizon longer than a determination period of 4 years should be proposed in some detail as part of a Pricing Proposal. Where the planning process as well as works execution are within the determination period, then the potential budget for such work should be sufficient as a forward cost estimate for the work.

        - It was noted that only one project currently managed by WaterNSW has a timeline greater than 4 years: the Keepit Dam post-tensioning project.

        - Having said this, WaterNSW are obligated to maintain a pipeline of work and it would be reasonable to demonstrate prudence by submitting projects planned in the short term as examples of prudent project formation. AssetBank maintains a 10-year forecast which is an effective Asset Management Plan which is risk prioritised, cost estimated and scheduled.

        - When Aither was commissioned by IPART to test prudence, they could draw down a list of sample projects and consider each. Hence WaterNSW could demonstrate an efficient process and, since the list was risk prioritised, a prudent basis for determining possible projects. What AssetBank cannot do is demonstrate options for the best possible resolution of an asset issue.

    d) IPART in the 2010 Research Paper accepted a proposal that Pricing Proposals should include the Asset Management Plan from the business, including a strategic view of forward work. WaterNSW submitted the AssetBank data to the IPART consultants, Aither.

        - The comments from North and South Coast valleys with respect to paying for the cost of works in their valleys given the low levels of water utilisation was of interest. WaterNSW concurred with their issues. The reality is that these valleys have dams and other structures which need to be maintained for both public safety and water utilisation. In their case, 90% of the user share is paid for by

government subsidy. In the case of the South Coast with a utilisation of 25%, this is generous.

- The table below is a report of groups of individual projects in North and South Coast valleys which are registered in AssetBank. They represent respectively 49 and 32% of the total capital investment requested for these valleys. It is unusual that the feedback did not indicate that at least this proportion of the funding was clearly needed.

Project Name	Facility	Cost	Budget	Cost%
NCT-TOR-001 -- Toonumbar Renewals	Toonumbar Dam	545000		
NCT-TOR-001C -- Toonumbar Crane Renewals	Toonumbar Dam	65000		
NCT-INVESTIGATIONS	Toonumbar Dam	11000		
NCT-UNREG	Cob-O-Corn Creek Weir, Fawcetts Creek Weir No 1, Fawcetts Creek Weir No 2, Goolmagar Creek Weir, Mungay Creek Weir No 6, Mungay Creek Weir No 8, Shannon Brook (Deep Creek) Weir	50695.49		
NCST - Plant and Equipment 60HP		67000		
North Coast Health and Safety Upgrades		131256		
North Coast Total		**869951.5**	**1777000**	**49**
STH-BRO-001 -- Brogo Renewals	Brogo Dam	206568.2		
STH-BRO-001C -- Brogo Crane Renewals	Brogo Dam	260000		
STH-INVESTIGATIONS	Brogo Dam	8000		
STH-UNREG	Allsops Creek Weir, Colombo Creek Weir, Croobyar Creek Weir No 1, Croobyar Creek Weir No 2, Croobyar Creek Weir No 3, Croobyar Creek Weir No 4, McLaughlin River Weir, Mogendoura Creek Weir, Tapitallee Creek Weir, Penrith Weir, Theresa Park Weir	70415.75		
Brogo - Crane Conformance		35000		
SCST - Plant and Equipment		23000		
South Coast Health and Safety Upgrades		119268		
South Coast Total		**515683.8**	**1601000**	**32**

Table 5 North and south Coast Valley Significant Projects (2017/21)

e) The issues which no doubt the customers allude to is the need to better understand the requirements behind each project and secondly, are the estimated costs best value for money?

2. Prudent capital works delivery

a) There were two key reasons for the WaterNSW underspend in the capital program described in the Pricing Proposal. First was that the underfunding against the 2014 request meant that large projects had to be cancelled or deferred. Secondly 31% of the approved funding was reallocated to more important projects, which sets a precedent particularly with the use of annual project reviews and customer engagement.

b) It should be considered reasonable that a 30% allowance throughout the determination period is allowed for substitute projects, taking advantage of

WaterNSW's extensive customer consultation process and annual project review process.

c) The variance or under delivery of the capital program in 2014/2017 was reported to be on average 18%, but at the time of writing, the 2016/17 variance had dropped to 12%. This demonstrates improvement of the organisation and provides guidance what its current approach can achieve, without taking into account ongoing improvements as the integrated organisation (from two earlier authorities) refines its internal processes. A performance target should be set within WaterNSW and then monitored for the delivery of individual capital projects. A probable target will lie between 5 and 12.5% which is half of the NSW Treasury allowance[31] for price variance for planned projects and business cases respectively.

d) Project underspend (and indeed overspend) may be facilitated by monitoring two metrics:

- On time delivery of projects; and
- Individual planned cost to actual cost.

e) As per the table above which reported logical groupings of projects or programs, WaterNSW intend to release such groupings in blocks of work to drive best value pricing from the market. To this end, WaterNSW have sought tenders from large contracting organisations to join a panel from where they may efficiently tender and be selected for specific program delivery. This was described in the WaterNSW proposal in Section 13.5.2.

The commentary above is representative of the issues related to asset management, some of which were also repeated at the Moree and Coleambally forums. Other issues were also raised such as price disparity between valleys, notably the purported high cost of water in the Peel valley. Such comments challenge the logic as to allocating costs on local infrastructure to the valleys in question or otherwise bundling up the work and averaging the costs across all valleys on some basis such as water allocations. These issues are outside the scope of this analysis.

Two items were particularly striking in reading the material from the forums:

- The lack of reference to details of projects which would logically be raised in the CSCs; and

- The persistent view that the MEERA approach (which is the treatment of Risk Cost) led to a lack of transparency of the proposed projects.

The first is a matter for WaterNSW communications but the second is equally of interest insofar that:

- The Risk Cost analysis is a recognised technique to determine timing on risk versus cost basis, and cannot mask projects. The projects must be identified and then the analysis applied. The understanding of the WaterNSW capital pipeline management, utilising asset checks and health indices, Risk Cost, project formation and business cases may need to be improved within the CSCs to lift confidence that the resulting body of work is prudent.

[31] NSW Treasury, TPP 08-5, Guidelines for Capital Business Cases December 2008

- WaterNSW should consider communicating the risk profile of the assets which gives rise to the project proposals which in turn are analysed on a Risk Cost basis. This is an essential aspect of the project communication which the CSC process must accommodate so that people know what they are purchasing.

Summing up, it appears that WaterNSW meets the efficiency test quite well with their submission but are lagging in their ability to demonstrate meeting the prudence test.

3 Aither Expenditure Review 12/2016

The Aither expenditure review has seven key parts plus an extensive Appendices reviewing a sample set of capital projects. Section 2.3 of the Aither report correctly defines efficiency and prudence which are the criteria of the tests Aither were tasked to apply. With respect to the approach advised by Aither there is a fundamental concern with the treatment of asset renewals as advised in Section 2.7.1. Renewals were tested solely based on AssetBank records and sampling of specific projects. As will be stated in this analysis, the capital program of WaterNSW is managed as a continuum which includes AssetBank but also includes:

- A routine inspection program which records asset health indices in the asset information system;
- A capital investment plan managed by the Projects team, ADP;
- Specific business cases and project proposals, typically managed by the Projects team; and
- Project delivery tracking, again managed by the Projects team.

Reference to artefacts from these processes was not present in the Aither report.
In this analysis, we follow on from the comments in Section 2.4 that WaterNSW struggles to demonstrate prudence in its specification of capital works per valley. This point was realised in Aither's executive summary where it stated:

1. Strategic management processes and documentation appear to be robust and generally effective. Having said this, concern was then raised regarding forecasting the need for asset renewals plus project assessment and options analysis.
2. Past (current regulatory period) capital expenditure is considered generally prudent and efficient, noting the 2014/17 underspend which appeared to be satisfactorily explained by WaterNSW.
3. A reduction by $33.4M is recommended in WaterNSW's capital plan.

Item 3 is a direct consequence of recommendations in items 1 and 2, and will be treated in conjunction with their consideration.
Item 2 is of interest: it states that WaterNSW has demonstrated prudent capital management practices in the past. This is a more generous view than the work documented in this report has found, eg the comments included in Section 2.3 above.
It was therefore considered that item 3 resulted from two concerns associated with Item 1:

- The risk basis for forecasting the need for work was challenged; and
- WaterNSW did not demonstrate adequate evidence of options analysis and project business case formation.

These two items go to the heart of the test for prudence and efficiency associated with cost optimisation, and will be considered in this section.
It should be noted that in Section 2.7.5 of the Aither report the definition for efficiency is extended to the cost effectiveness of a proposed project which relates to the term "expenditure" in the definition of efficiency in Section 2.3. Hence cost effectiveness is included as part of the efficiency test which results from options analysis. IPART states … "the efficiency test should assess whether the business' past and forecast capex represents

the best way of meeting the community's need for the relevant services.[32]" This point is made since it is agreed that WaterNSW are efficient in terms of compiling the whole investment portfolio, ie the Capital Investment Plan put forward by WaterNSW is efficient in its entirety. It remains to be seen if its individual projects are in themselves efficient in terms of cost optimality.

3.1 Risk Basis for Forecasting Work

The Aither review team analysed the risk metrics utilised in AssetBank and noted in Section 3.4.2 of their report:

> *The review team notes that the risk assessment component of Assetbank relies on a coarse assessment of condition (only two categories represent assets in poor condition), and includes an advancement of works that are assessed as high risk without due consideration of ways to mitigate or manage the risk. We consider the risk assessment process to be overly risk averse, which may lead to inefficient expenditure forecasts.*
>
> *The review team spent some time with WaterNSW staff reviewing a number of projects within Assetbank and also the methodology and logic behind the assessment processes and while the system and process is sound, we were unable to determine the accuracy and validity of input data. The review team is therefore concerned that if the input data cannot be independently verified (such as an external reviewer sighting a sufficient sample of this data and supporting information) then the output data, on which the asset programs are based, cannot necessarily be relied upon.*

There are three concerns raised by the reviewers in these statements:

- The choice of risk metrics selected for use by WaterNSW;
- The lack of risk mitigation in the metrics, ie they are a function of consequence and likelihood but do not consider mitigating factors; and
- Integrity of the data supplied to AssetBank and whether the provenance is consistent and a repeatable means of assessment.

In other words, the reviewers believe the risk assessments are an educated guess using a crude risk matrix which does not consider mitigation. This position may be challenged.

1. The risk criteria used to rank issues which articulate the need for projects is a well posed risk matrix made up of the following:
    - Asset Condition considerations:
        - Physical Condition – is the physical condition adequate for the intended operation in the local working environment
        - Function – is the function of the asset impaired below acceptable level
        - Monitoring – is the asset getting any additional attention (intervention or surveillance)
        - Wear & Tear – is the asset deterioration greater than what is consistent with fair wear and tear for its age
        - Probability of Failure / Breakdown – is there an elevated probability of failure
        - Safety – are there safety risks to be addressed
    - Service Potential considerations:
        - Spare Capacity – is the asset correct sized and otherwise has the capacity for its intended operation

[32] IPART, Regulatory Tests of Past and Forecast Capital Expenditure, Research – Final Report, December 2010. Section 2.1

- Compliance – is the asset condition or operation outside or will fall outside compliance limits
- Maintainability – is the asset design or technology easily maintained
- Surplus – is the asset surplus to the function (and reliability) of the system in which it resides
- Economic Viability – is the asset costing WaterNSW an excessive amount to operate or maintain

Performance scores allocated to assets under these criteria rank the likelihood of a hazardous event being realised. The assessment criteria which is to be applied to these criteria is:

5 – Very Poor: asset has failed or failure is imminent or WHS risks are unacceptable
4 - Poor: asset is functioning but requires a high level of maintenance to remain operational
3 – Fair: asset is functionally sound with moderate deterioration (eg fair wear and tear)
2 – Good: asset is in sound condition and meets all service requirements
1 – Very Good: asset in 'as new' condition

2. The scores have a confidence level associated with them, using the following rating:

4 – Excellent Knowledge: as per Rating 3 plus non-destructive testing or other detailed analysis/monitoring
3 – Good Knowledge: as per Rating 2 plus inspections by competent personnel
2 – Some Knowledge: desk top reviews by competent personnel with reasonable records
1 – Limited Knowledge: some records, photographs or other evidence available

The distribution of confidence levels in AssetBank is as follows:

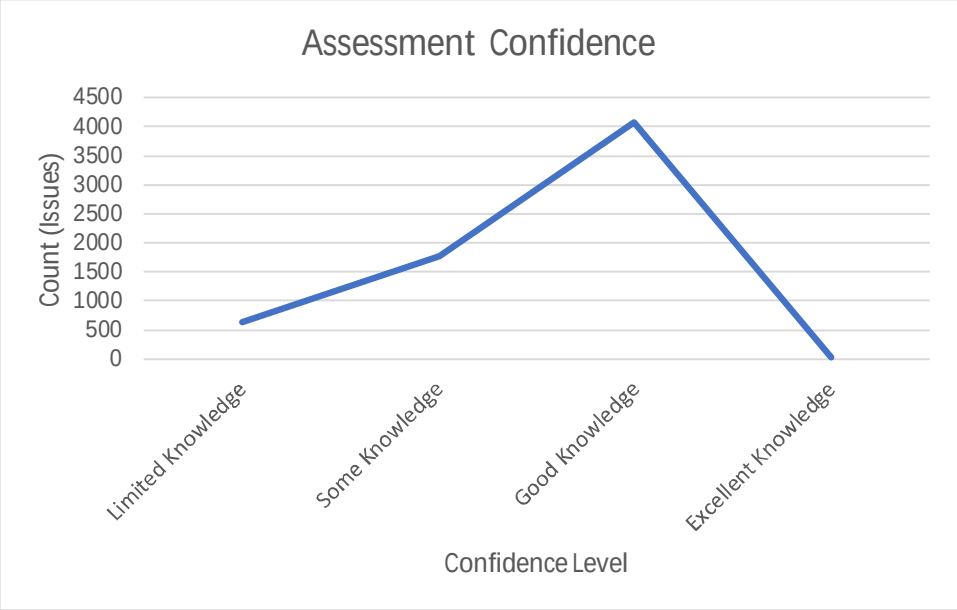


Figure 10 Assessment Confidence of Asset Risks

3. The significant reliance on inspections is managed through routine inspections and the recording of asset health indices in the asset information system, SmartAsset. This data forms the bulk of the justification of issues recorded in AssetBank.

4. Based on the information above, the WaterNSW risk assessment process is robust and well supported by field inspections.

We now consider the fairness of the concern that the risk factor does not include a mitigation parameter. IEC 60812[33] suggests mitigation factors including:

- Redundant items that allow continued operation if one or more elements fail
- Alternative means of operation
- Monitoring or alarm devices; or
- Any other means of permitting effective operation or limiting damage.

The other means include maintenance intervention, reduced operation or inserting barriers of some kind to slow the progress of damage. These are typically OpEx considerations which may be reasonably presumed to be implemented when routine inspections identify advanced deterioration and there is a need to wait for capital renewal.
If we consider capital intervention, the most frequent example is refreshing the paint scheme or some other surface protection, or waiting until corrosion has progressed that a structure or item needs to be replaced. It would be an accusation of gross lack of prudence to accuse WaterNSW engineers of being prepared to compromise paint schemes. Reviewing a 2016 version of AssetBank data, of the 2326 projects registered, 115 involved painting.
For these reasons, we do not consider the capital planning is essentially conservative or flawed, and the Risk Cost process does allow options to be developed which are based on WaterNSW's experience in handling similar problems in the past. We believe that the review team could have placed more confidence in the use of AssetBank to prudently determine the right work to address the issues which have so efficiently been identified.

3.2 Options Analysis and Project Business Case Formation

It was noted in the Aither report (reference Section 3.3.8):

> *The approach WaterNSW takes to evaluating and managing risk is important in the context of developing its forward capital plan. For example, the level of risk that WaterNSW is willing to accept in relation to assets (including of different types) will inform if, and when, remediation works may be undertaken. This feeds into expenditure proposals, as assessments of risks will inform which works need to be prioritised, and for which funding is then sought. The approach to risk will inform both relative priorities and the sequencing of works over time. An example of this seen with Assetbank is that if the risk score exceeds pre-set thresholds ($10,000 and $100,000), the observed condition of the assets is downgraded by 1 or 2 increments respectively, triggering remediation before the condition score alone would suggest. Alternative solutions to managing or mitigating risk rather than 'buying out' risk with capital expenditure can also potentially defer capital works, and therefore delay expenditure requirements, should cost-benefit analysis indicate this as the lowest total life cost option.*

Hence WaterNSW has a consistent approach to assessing risk, based on condition (which informs the likelihood of the risk), and which will expedite work where the cost of the consequence exceeds threshold values. Secondly, the process does not automatically "buy out" risk with a capital replacement, which was a concern levied at WaterNSW in the forums referenced in Section 2.4.1.
This view of AssetBank tallies with work conducted with data extracted from the tool, some of which has been analysed and is referenced in Section 2.3.2 of this document. The AssetBank tool has compiled thousands of individual project opportunities, each of which is risk prioritised as discussed in Section 3.1. This allows the formation of risk profiles per major asset as well as valley, which WaterNSW does not well communicate. This is borne out by the comments in Aither Section 2.4.1 where the customer base feedback indicates a lack of appreciation of what the capital funding is supposed to achieve.
The Aither team signed off on the WaterNSW approach that high priority projects are identified early and are allocated reasonable and rational timeframes. This is the first step of the process to deliver capital works, and is considered prudent.

[33] IEC 60812 – Analysis techniques for system reliability – Procedure for failure mode and effects analysis (FMEA), 2006

Having said this, the WaterNSW process is rejected as not being prudent because:

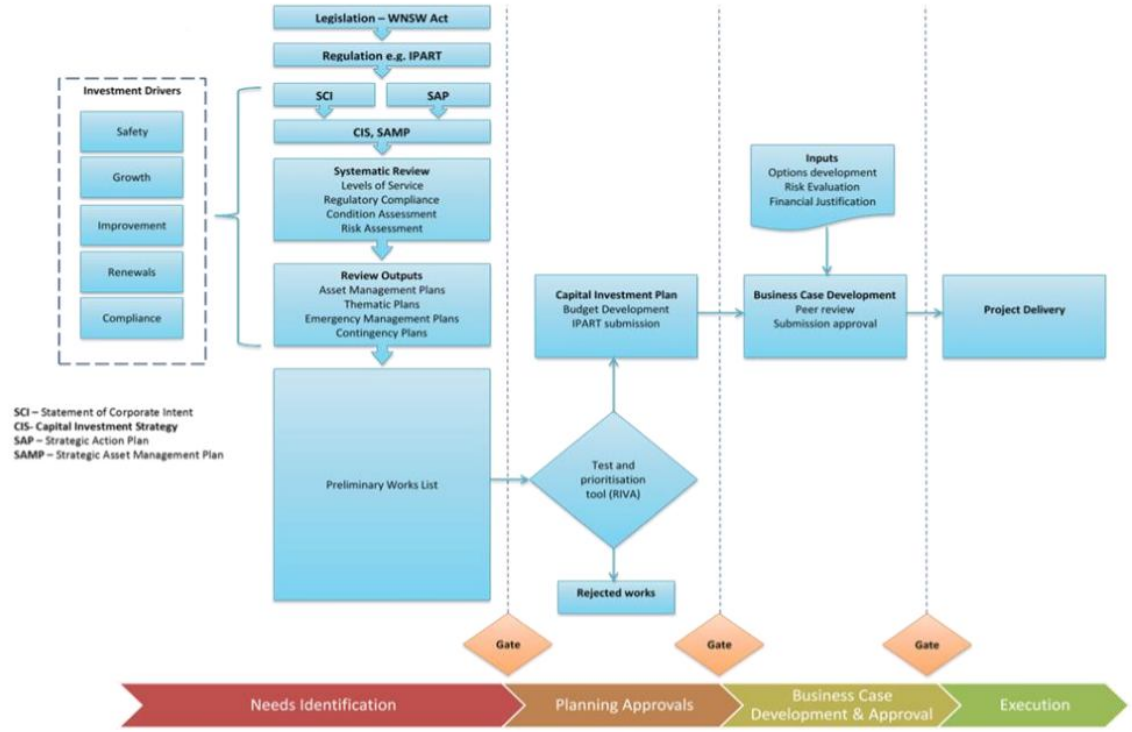
> *In summary, this is because the majority of the proposed forecast expenditures have not yet been fully scoped or put through the 'Approval to Spend' step of the approval process. This has resulted in a proposed four year capital expenditure program with minimal detail on what is proposed, compared with the detail available in previous expenditure reviews for WaterNSW and in comparison with other regulated businesses. While there is a list of individual items that underpin the overall capital expenditure proposed, these are typically amalgamated at a higher program level. This amalgamation has been carried out either on a valley by valley basis (such as all renewals in the Hunter Valley) or across functions (such as electrical switchboard and power upgrades).*

Further, after commentary from WaterNSW attempting to justify their approach, the report continues:

> *While the review team understands the logic of providing flexibility to undertake expenditure based on needs, which may change during a four or five year period, the approach taken by WaterNSW does appear to compromise both transparency around proposed spending, as well as accuracy of estimation and forecasting. Stakeholders such as Murrumbidgee Irrigation and the NSW Irrigators Council have expressed similar concerns at recent public hearings and in written submissions. Given the long lived nature of water assets, the review team expected that the majority of the proposed forecast expenditures would either be in the form of defined projects, with clear scopes, pricing and timing or in the form of programs of work with clear trends and reasons for variations from trends. The revised approach to capital investment appears not to provide much in the way of justification at the project or program level.*

Hence the review team does not agree with WaterNSW's approach to capital planning.

We may now return to the entirety of the WaterNSW capital investment strategy which is included in the Aither report as Figure 5.



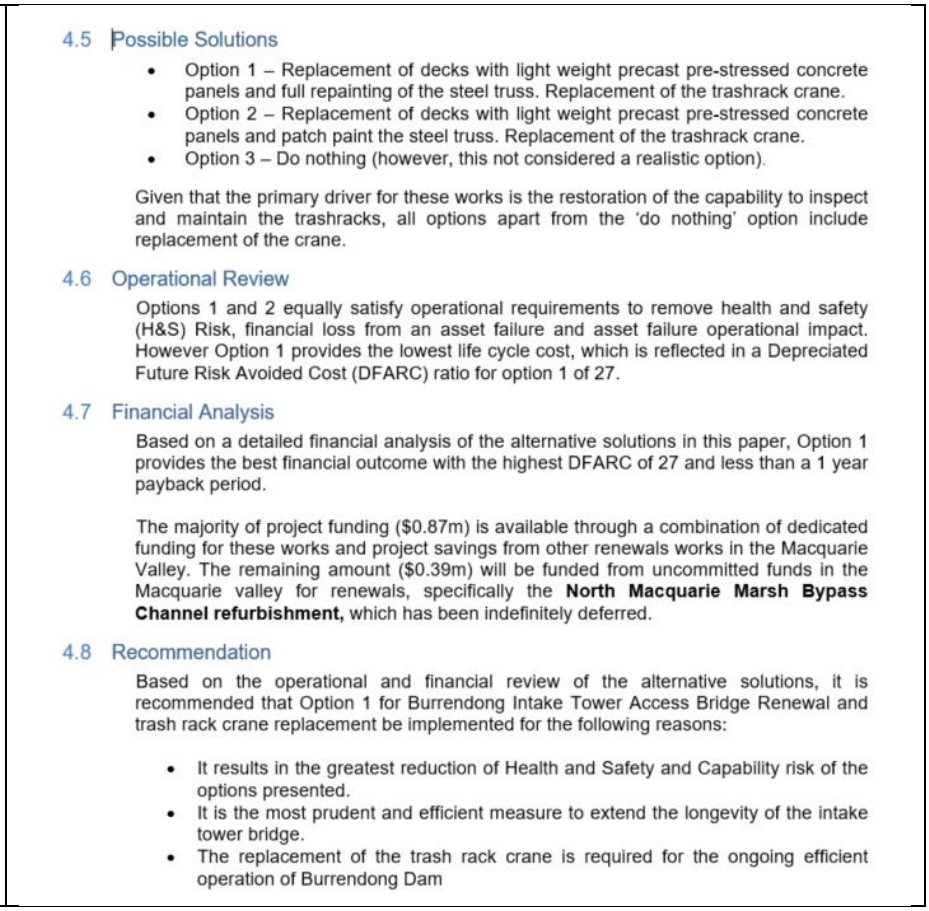
Source: WaterNSW Capital Investment Strategy (FY2017- 2021 p. 5)

Figure 5 Capital investment process within the AMS

Figure 11 Extract from the Aither Report: WaterNSW Capital Investment Process

A sample was obtained of the standard documentation WaterNSW apply for all actual expenditure prior to Project Delivery. While the documentation is extensive two key pieces are shown:

Rationale	**4. Executive Summary** **4.1 Purpose** The purpose of this document is to seek Board approval for the recommended option for the **Burrendong Dam Intake Tower Access Bridge and Trash Rack Crane Renewal**, at a cost of $1.13M, plus a contingency of $0.13M, totalling **$1.26M**. This document describes the business justification for the project. **4.2 Issue** The trashrack Crane within the ***Burrendong*** intake tower is currently inoperable due to noncompliance, preventing removal of trashracks for inspection. The current condition of the access bridge deck slabs prevents the required vehicular access for crane renewal. The trashracks are overdue for inspection/ repair and are considered to be at risk of failure due to corrosion. Following further deterioration of the slabs, the bridge has been isolated from personnel access potentially impacting operation of the temperature control curtain and emergency closure fixed wheel gate. **4.3 Background** Burrendong Dam was constructed in 1967. The Intake Tower houses the emergency closure Fixed Wheel Gate (FWG), the trash racks and a 2.5t intake crane (Trash Rack Crane). The function of the FWG is to stop the flow in the penstock in an emergency (such as failure of one of the outlet valves). The trashrack crane failed a compliance audit in 2011, preventing the removal of trashracks for inspection and maintenance. The trashracks have not been removed since 2007 and are now overdue for inspection. The intake tower access bridge provides personnel and vehicle access to the intake tower. It comprises 54 reinforced concrete deck slabs which are supported by a steel truss bridge. Efficient operation of Burrendong Dam will not be possible without continued safe access to the Intake Tower via the access bridge. A 2011 report reduced the rating of the bridge. This has prevented vehicular access required for crane renewal. Worsening cracking observed in early 2016 has resulted in the bridge being isolated from personnel access. This prevents access for operation of the FWG in the case of emergencies, and operation of the temperature control curtain. The coating on the supporting steel truss bridge has failed and the steel I-beams are experiencing surface corrosion. **4.4 Objectives** The objective of the project is to ensure the ongoing safe access to the intake tower for various operational purposes and safe and effective maintenance of the trashracks.

Options Analysis	

4.5 Possible Solutions

- Option 1 – Replacement of decks with light weight precast pre-stressed concrete panels and full repainting of the steel truss. Replacement of the trashrack crane.
- Option 2 – Replacement of decks with light weight precast pre-stressed concrete panels and patch paint the steel truss. Replacement of the trashrack crane.
- Option 3 – Do nothing (however, this not considered a realistic option).

Given that the primary driver for these works is the restoration of the capability to inspect and maintain the trashracks, all options apart from the 'do nothing' option include replacement of the crane.

4.6 Operational Review

Options 1 and 2 equally satisfy operational requirements to remove health and safety (H&S) Risk, financial loss from an asset failure and asset failure operational impact. However Option 1 provides the lowest life cycle cost, which is reflected in a Depreciated Future Risk Avoided Cost (DFARC) ratio for option 1 of 27.

4.7 Financial Analysis

Based on a detailed financial analysis of the alternative solutions in this paper, Option 1 provides the best financial outcome with the highest DFARC of 27 and less than a 1 year payback period.

The majority of project funding ($0.87m) is available through a combination of dedicated funding for these works and project savings from other renewals works in the Macquarie Valley. The remaining amount ($0.39m) will be funded from uncommitted funds in the Macquarie valley for renewals, specifically the **North Macquarie Marsh Bypass Channel refurbishment,** which has been indefinitely deferred.

4.8 Recommendation

Based on the operational and financial review of the alternative solutions, it is recommended that Option 1 for Burrendong Intake Tower Access Bridge Renewal and trash rack crane replacement be implemented for the following reasons:

- It results in the greatest reduction of Health and Safety and Capability risk of the options presented.
- It is the most prudent and efficient measure to extend the longevity of the intake tower bridge.
- The replacement of the trash rack crane is required for the ongoing efficient operation of Burrendong Dam

Figure 12 Sample Documentation – Capital Projects Management

In Section 3.4.2 of their report, Aither noted that WaterNSW could not provide business cases for work other than that which will be in progress at the commencement of the determination period. Hence there are three reasonable tests which may be applied to the WaterNSW Pricing Proposal for capital works:

- Based on experience in the current determination period, WaterNSW do not commit funds without detailed and extensive analysis and professional documentation. This ensures that projects which are undertaken represent the best option at the time and may therefore be considered prudent.

- It is correct that WaterNSW did not include sample business cases in their Pricing Proposal. An appendix which includes details of the process by which projects are formed and justified may be helpful as communication, and considered as an Appendix in future submissions. This would assist the reader by providing evidence of a consistent process which is sound and may be considered prudent.

- Further the Pricing Proposal would have benefited from more information on the risk profile of the assets throughout the valleys which would have strengthened the case for the increased tempo of the Capital Investment Plan.

But in the 2010 Research paper referenced earlier in this report, IPART rejected the concept of detailed capex reviews[34]. This decision was made based on two considerations:

- *The regulatory requirements (for the submission) were already highly detailed*; and

[34] IPART, Regulatory Tests of Past and Forecast Capital Expenditure, Research – Final Report, December 2010. Section 4.3

- Consulting firms advised IPART they did not consider themselves well placed to comment if "*… an individual capex program was efficient or not".*

3.3 Capital Renewal of Assets per Valley

In Section 8.1 of the Aither report, it was proposed that a reduction of 25.6% could be to all valleys' capital renewals based on the following assumptions:

- 3.2% deferral of work which is low risk;
- 9.6% for reduction of work based on scope change or estimation inaccuracy;
- 4.4% due to deferral of work; and
- 8.3% due to carry over into next determination period.

These figures were derived in part from reference to Section 18.4.1 of the WaterNSW Pricing Proposal which stated the following variances:

- 2.2% reduction due to cost improvements less scope changes and cost increases;
- 8.6% was due to project delays;
- 13.7% reduction due to strategic deferrals less commitment of substitute projects. This is considered a function of the ACCC determination in 2014 which blocked significant projects; and
- 3.7% due to other causes.

Hence the outer bound of possible variance based on the 2014/17 period is 28.2% with a significant portion of this due (13.7% of the total variance) due to significant projects not proceeding following the 2014 determination.
The claim that WaterNSW's AssetBank is conservative and 3.2% of the work can be safely dropped was proposed by Aither referencing the data in AssetBank. This claim cannot be independently verified since the calculation was not provided. The basis that AssetBank is inherently risk adverse is not the experience of this author since it calculates a lower bound of renewal investment rather than an absolute replacement cost of the relevant structure or item of equipment. The options include paint schemes and other capitalised maintenance work.
The figure of 9.6% of variance due to scope change or estimation accuracy may be challenged. The current pricing determination period found that WaterNSW could achieve savings of around 2.2% but then needed to cover additional costs due to other causes of 3.7%. Hence the variance due to changes in committed work is around 1.5%, significantly less than 9.6%. It is reasonable to believe that WaterNSW would tune its project portfolio and committed funds to keep this level of variance as close to zero as possible through normal budget control processes.
The remaining factors making up the 25.6% are then considered. In the current determination period WaterNSW estimates that there are 7.3% of delays (based on $8.6M being delayed from the original budget of $117.2M). This equated to the reduced Aither estimate of 4.4% for deferral of work.
It is the treatment of the current determination period's combined variance of 13.7% due to strategic deferrals and substitute projects which is of concern. Based on this, Aither has postulated that WaterNSW will underspend by 10% in not being able to commission some projects in the next determination period. This is a misreading of the WaterNSW Pricing Proposal which states the 2014 ACCC determination led to a "*… complex exercise and*

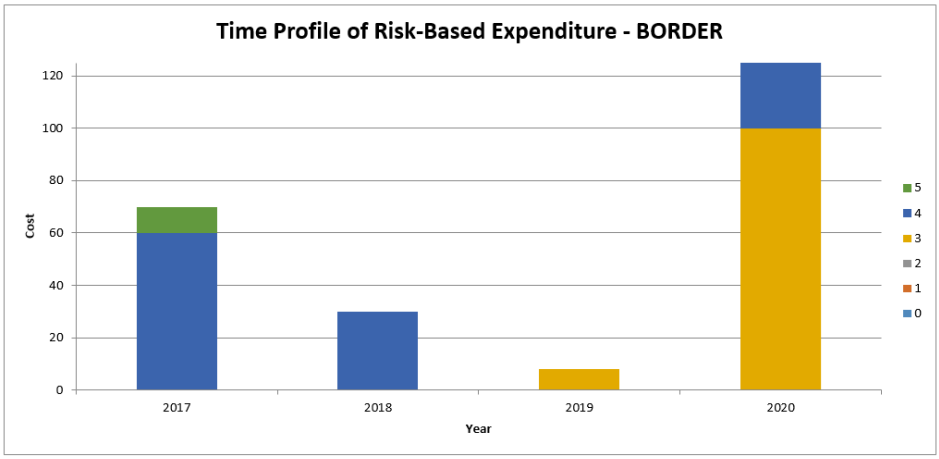
involved rebalancing priorities. This was made more difficult by the inability to reallocate capital expenditure funds between valleys …"[35]
WaterNSW would be reasonably expected to make a case that if such complexities are not repeated, then even a lower expectation of 10% from the original 13.7% shown in the current period is not realistic.
WaterNSW would be advised to further challenge the basis of the 25.6% parameter, noting that:

- If 13.7% of the variance in the current determination period was due to WaterNSW having to cope with a substantial cut in their funding from the proposed plan which had been risk prioritised, then there is case to suggest the maximum degree of variance WaterNSW induced in the current determination period was 14.5%; and

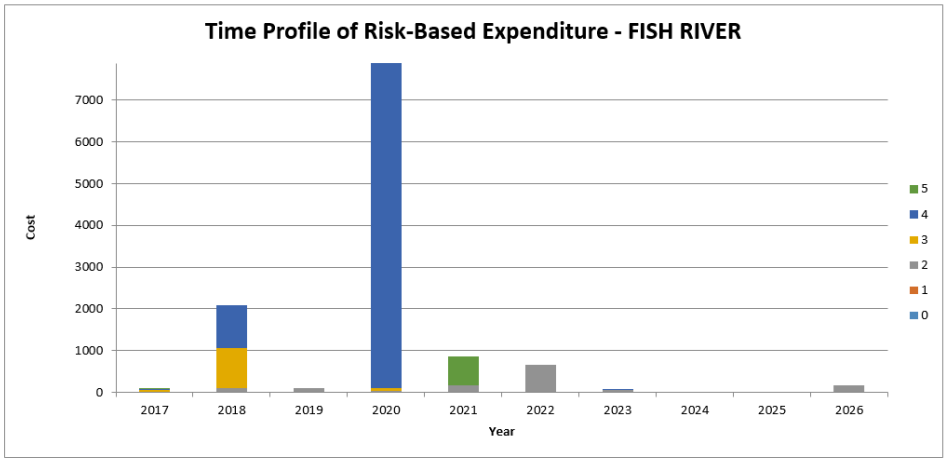
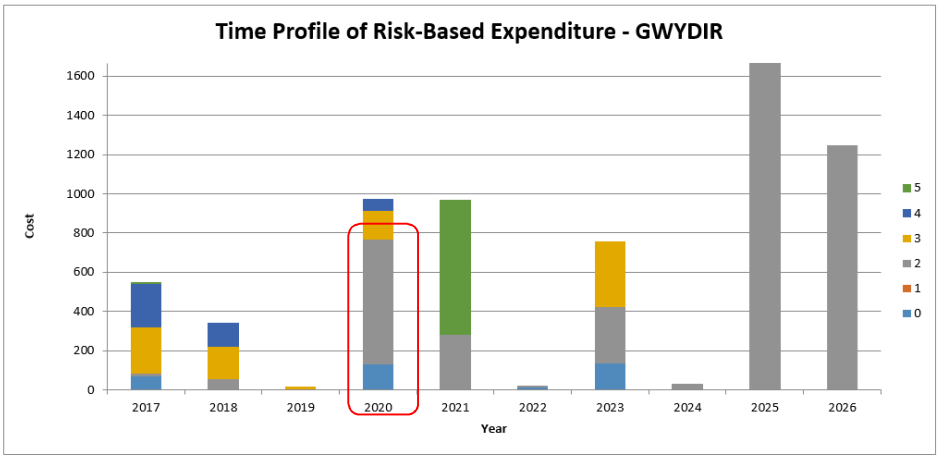
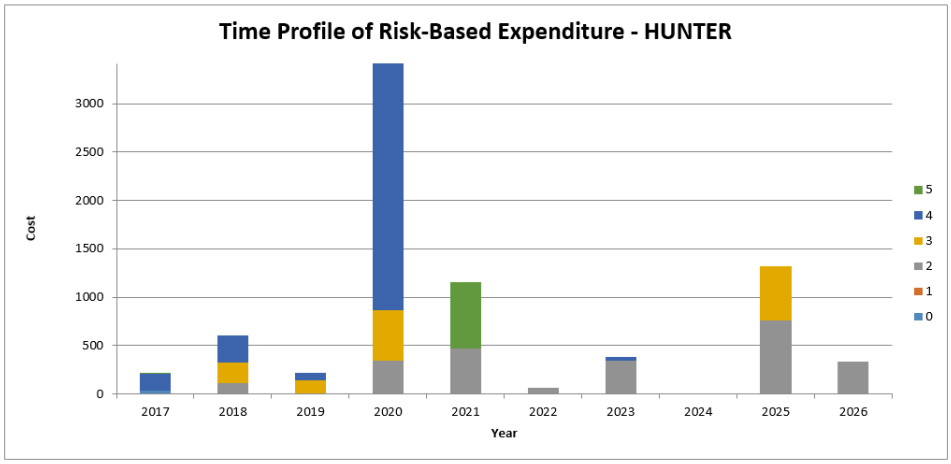
- WaterNSW have put forward and Aither concurred that the business has improved capital planning processes now in place as it matures from the merger of two state-owned organisations.

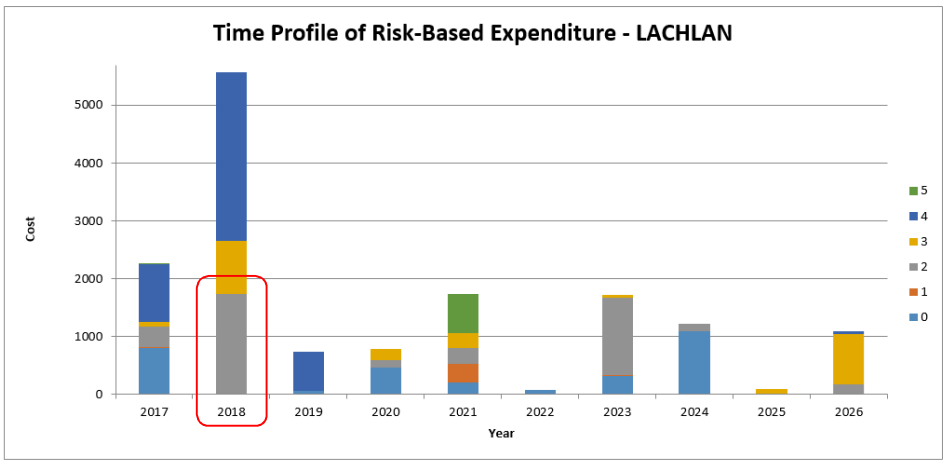
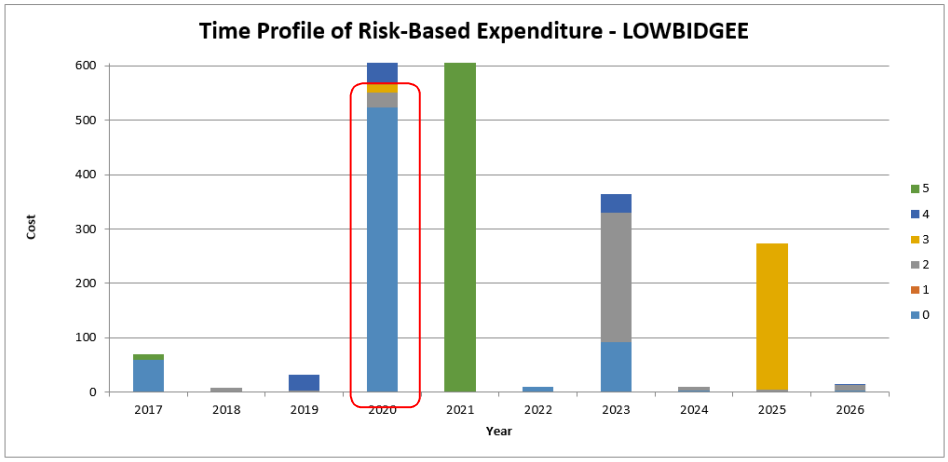
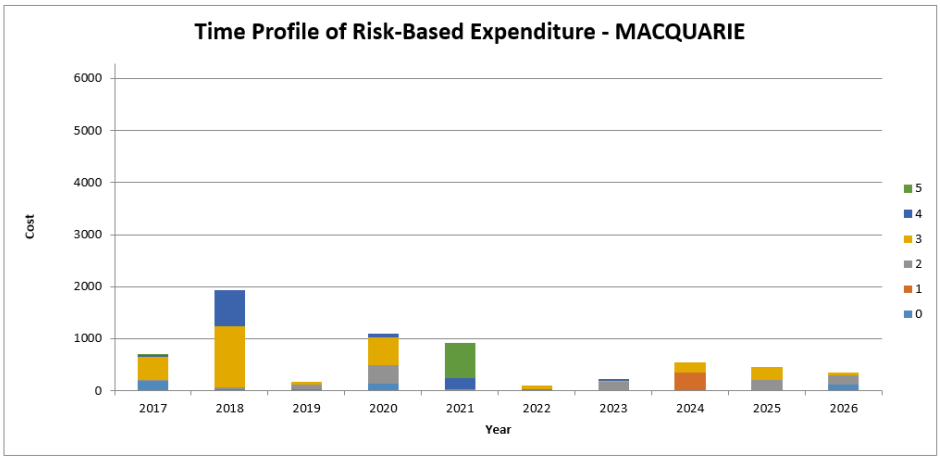
3.3.1 Risk Profiling per Valley

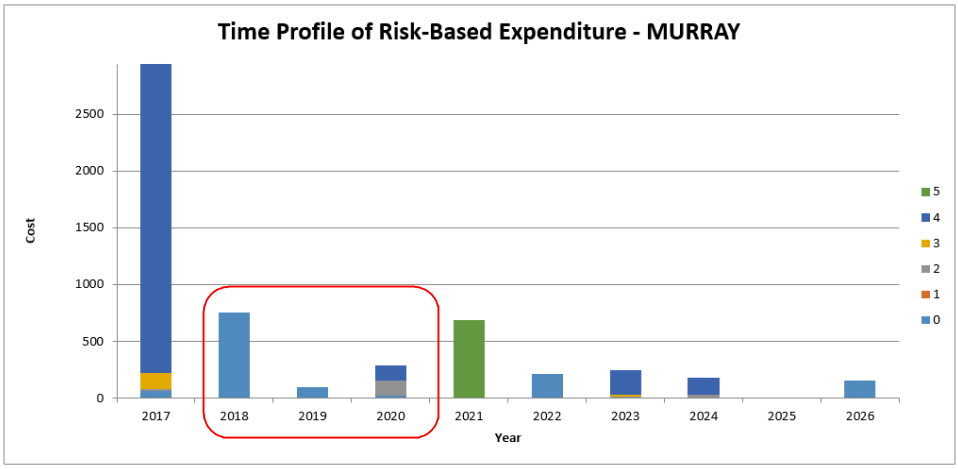
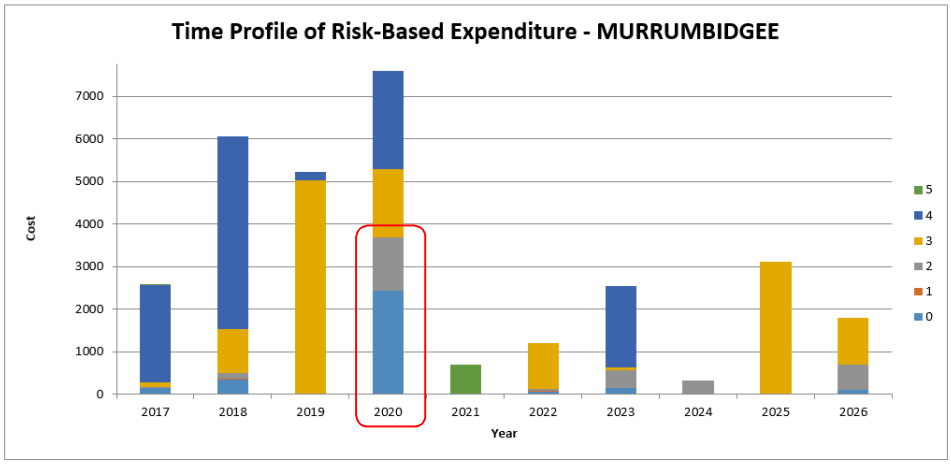
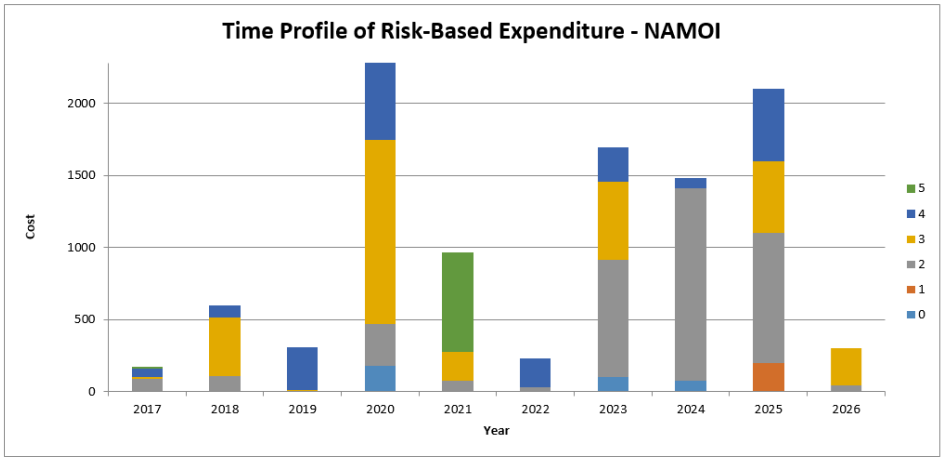
The risk profiles provided below indicate valleys for which no funding reduction should be contemplated due to the proportion of higher risks in their profile (red left hand column). Valleys where some challenge may be tolerable are indicated (green left hand column) as those where WaterNSW has internally classified the risk drivers as being lower (ie null through to risk level 2). Reporting such as this would help independent assessors determine the prudence of ensuring that proposed work is supported.

Border	 25.6% reduction NOT tolerable

[35] WaterNSW Pricing Proposal, Section 18.4.1.2.

Fish River	 25.6% reduction NOT tolerable
Gwydir	 25.6% reduction tolerable – low risk work in FY2020 but ensure high risk work in FY2021 proceeds
Hunter	 25.6% reduction NOT tolerable

Lachlan	 25.6% reduction tolerable – possibly defer some of the FY2018 work
Lowbidgee	 25.6% reduction tolerable – risk not classified for FY2020 work
Macquarie	 25.6% reduction NOT tolerable

Murray	 25.6% reduction tolerable – presuming FY2017 work is all completed. Must ensure FY2021 work is undertaken.
Murrumbidgee	 25.6% reduction tolerable – potentially reduce work in FY2020
Namoi	 25.6% reduction NOT tolerable

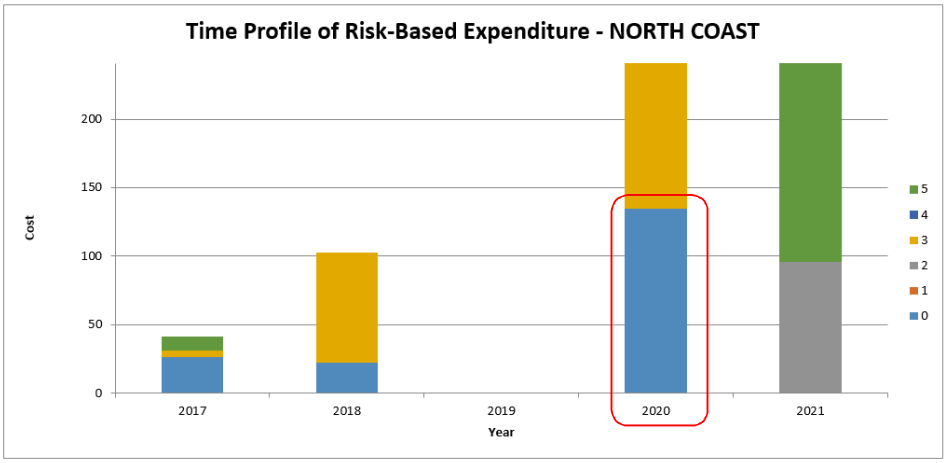
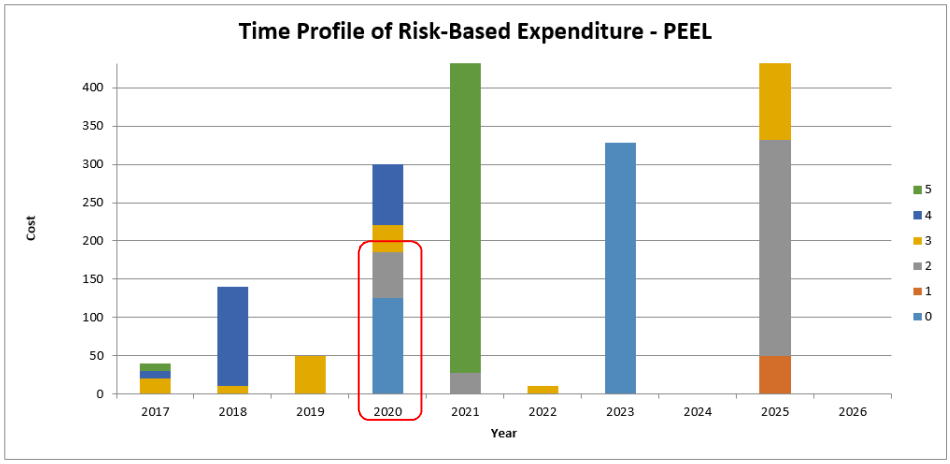
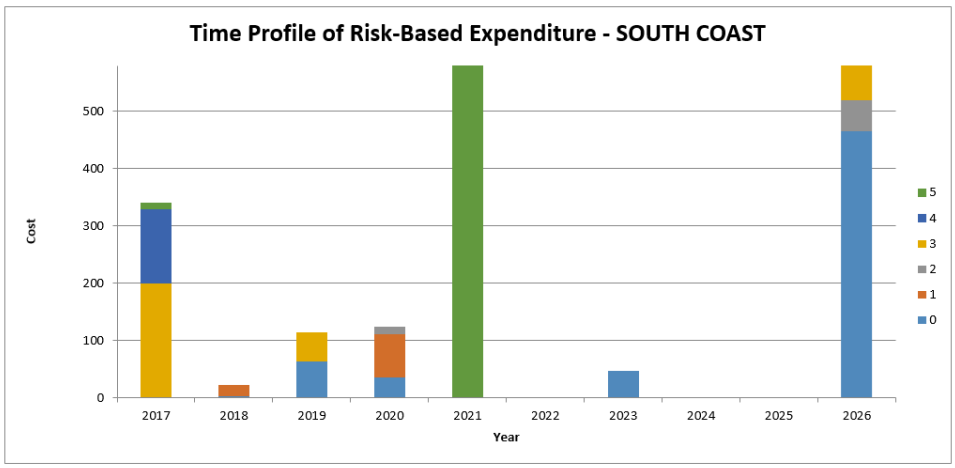
North Coast	 25.6% reduction tolerable – potentially reduce work in FY2020 but ensure some of the high-risk work in FY2021 is completed
Peel	 25.6% reduction tolerable – potentially reduce work in FY2020 but ensure some of the high-risk work in FY2021 is completed
South Coast	 25.6% reduction tolerable – potentially reduce work in FY2018-20 but ensure some of the high-risk work in FY2021 is completed

Figure 13 Risk Profiles of the proposed Capital Works Portfolio

While the absolute values of projects might be different with recent AssetBank updates and new projects entering the portfolio, it is contested that the risk profile of each valley is not moving significantly within the determination period. This may change with incoming asset audits but such variance would be covered by the allowance of 30% flexibility in the overall schedule which has been discussed before.

3.4 Findings on the Aither Report

1. The Aither review team noted that WaterNSW have processes and systems that are "… of good quality and industry standard tools that should lead to sound investment decision making." (reference Section 3.45 of the Aither report.)

2. The key concerns raised by Aither are:

    a. Coarse condition assessments

    b. Lack of certainty in project scopes

    c. Justification of programs of work.

    Item (a) may be reasonably refuted by WaterNSW, reference Section 3.1 of this report along with comments in Section 2.2.2 of this report regarding asset health tracking. The issue here is that WaterNSW do not well communicate their processes and do not provide transparent reporting on risk profiles based on results from routine inspections. This issue applies as much to WaterNSW's customers as it does to IPART and its supporting consultants.
    Items (b) and (c) are problematic since they reflect a difference in opinion on the management of capital work pipelines between WaterNSW and the review team. This will make it challenging for IPART to make a fair determination.
    WaterNSW believes that in accordance with its pipeline model for the flow of capital work, business cases and detailed plans result in good time after work has been identified and entered the work list with a risk-based priority and preliminary estimate, and has been consolidated into a cost-effective program of work. In such case the business case results for the overall program and the detailed planning considers options analysis and final best price. In accordance with NSW Treasury practices quoted in this report, the best price should be ±10% of actual cost.
    Aither instead believes that at least in some cases for major projects, detailed planning and business cases should be to hand as part of a 4-year budget determination. There have been instances where Aither has relaxed this requirement and in other cases, where this requirement has led to an arbitrary cut in recommended budgets of around 25% per project.
3. The resolution of item 2 (above) which is proposed in this report is recommended to apply the following formulation:

    a. If the risks being managed by a proposed body of work which is recommended for funding reduction are manageable (ie risk levels 1 to 3), then:

        i. Where WaterNSW has not provided effective evidence of the purpose and rationale for work commencing FY2018, the reductions recommended by Aither are tolerable. WaterNSW needs to manage its capital planning better.

        ii. For work commencing FY2019 onwards, then the budget should be allowed but the annual project review will need to consider if these projects are planned and documented. Again, if WaterNSW is deficient in the application of its own capital planning process, then the work may be further deferred.

b. If the risks being managed by a proposed body of work which is recommended for funding reduction are not manageable (ie risk levels 4 to 5), then

    i. WaterNSW should be required to expedite the planning documentation for independent review. The budget should not be cut due to poor execution of WaterNSW's processes while WaterNSW is in a transition stage as the first determination period following the merger of two public entities.

    ii. This dispensation should only apply to this determination period, allowing WaterNSW time to mature its internal processes.

    iii. The commitment to expedite this documentation should be sufficient to allow FY2018 to progress without further review.

    iv. For work commencing FY2019 onwards, then the budget should be allowed but the annual project review will need to consider if these projects are planned and documented. Again, if WaterNSW is deficient in the application of its own capital planning process, then the work may be further deferred. WaterNSW will be held to account for poor management of high risk projects.

c. Flexibility needs to be maintained such that, as per the current determination period, up to 30% of the budget for the next determination period will be for projects scheduled into a specific year the year before, usually in response to a customer request but also due to unforeseen contingency management. This level may be subject to challenge, but there is no recognisable authority who can advise what the right level of fluidity in the schedule should be. It is conceivable that this metric should be tracked and steps taken to compress it through the determination period.

4. In Section 8.1 of the Aither report, a recommended reduction in funding of 25.6% for asset renewal capital spending was proposed. This was slightly lower than the total variance for the 2014/17 determination period. This parameter is the primary driver of the Aither recommendations for the reduction of the WaterNSW capital budget in the 2017/21 determination period.

    a. Of the $193.7M WaterNSW has requested in capital funding, $21.0M was recommended as a reduction based on the application of the 25.6% factors to reduce funding for renewals-based work.

    b. The remaining recommended reduction in capital funding of $12.4M was based on reviews of individual projects where the review team had significant concerns with the lack of documentation of project rationale and costing optimisation.

    c. In Section 3.3, it was advised that WaterNSW seek guidance on the justification of the 25.6% adjustment factor, since it would be reasonable to expect WaterNSW to achieve better than 14.5% in the current period based

on the acceptance of the need for a comprehensive capital plan to address the risk profile WaterNSW has determined across the valleys plus WaterNSW's internal improvements in the management of projects.

5. The Aither report had concerns with the following aspects of the WaterNSW approach:

    a. The detailed risk profiling which is based on routine inspections and asset audits, with data held in its asset information system which then flows into AssetBank;

    b. The methodology and detailed analysis used by WaterNSW to assess asset criticality, health and risk along with measures of the quality of the asset health indices;

    c. The flow of work from the planning process with its highlighted tool of AssetBank to the formation of projects and the development of sound, well costed projects. Possibly there was inadequate representation from the projects delivery team in the Aither review since there was little reference to artefacts used by this team in their projects formation. This may mean WaterNSW should review the formality of its interface between planning and project teams.

4 Conclusion

This analysis was asked to comment on three aspects of the WaterNSW Pricing Proposal and follow-up review by Aither:

1. *Review WNSW Rural Pricing Proposal and arguments behind the Investment required to offset Asset consumption.*

2. *Review the Aither report commissioned by IPART and their arguments for a lower level of investment*

3. *Provide independent advice (via a report), based on a qualitative analysis (as opposed to a detailed engineering qualitative dissection of WNSW model and data), as to:*

    i. *whether the investment proposed by WNSW should be considered reasonable and prudent, and/or*

    ii. *whether Aither's view has merit and should be supported (i.e. it's reasonableness in light of the facts), or otherwise;*

    iii. *the extent to which WaterNSW's approach, and investment level requested is on any other basis consistent with industry best practice, precedent etc.*

The findings of this work are:

WaterNSW Rural Pricing Proposal

1. The WaterNSW Rural Pricing Proposal was a comprehensive document which had consistency across all its sections, calculations and reports. Top level data analytics demonstrated that the funding across the valleys was balanced and where anomalies occurred, could be reasonably explained. To this extent, the Pricing Proposal is considered by this analysis to be efficient.

2. Without detailed quantitative analysis, it would be impossible to assess the prudency of the Pricing Proposal on its merits, so an alternative test was applied. The public forums conducted by IPART at which WaterNSW explained its investment strategy were studied in detail. The customers, presumed to be knowledgeable as to the benefits of WaterNSW's service, were used as a test as to whether the work is prudent and well delivered.

3. The essence of the feedback from the customers was that, with the significant exception being the representative from the Hunter, there was consistent concern regarding the investment portfolio and its execution by WaterNSW. These concerns centred on the rationale of the work which required the levels of investment being sought.

    a. The customers did not demonstrate an appreciation of the risk-based optimisation of the lower bound of costs per valley based on the Risk Cost process. They instead claimed the "MEERA process" was too conservative, where in fact evidence suggests that it is not.

b. The customers did not refer to the risk profile being managed in their valley even though these profiles are precisely what is driving the proposed work.

4. WaterNSW would be well advised to provide technical attachments to its Pricing Proposal as well as information briefings on both the Risk Cost method and its ability to optimise the cost of the overall portfolio as well as the risk profiling which is supported by extensive field assessments and audits.

Aither Report

1. In general, the Aither report was generous in its acceptance of WaterNSW's systems and processes, leading up to the formation of the investment portfolio for which funds are being sought.

2. Aither recommended a $33.4M reduction to the WaterNSW capital plan, made up of the following:

	Aither report
Original WaterNSW Capital Request	193708
Adjustment by Aither proposed 25.6%	-21016
Adjustment by other Aither challenged projects	-12367
%Reduction of WaterNSW Capital Request	17

Table 6 Aither Recommendations for Cost Reduction of the Capital Plan

3. The basis of the 25.6% across valley reduction in asset renewal capital projects is specified in Section 8.1 of the Aither report, largely driven by scope changes and late work deferred to the next period. These assumptions were based on historical performance reported by WaterNSW in Section 18.4.1 in their Pricing Proposal. Again, with the greatest respect to the Aither specialists, it is recommended that the value of 25.6% be challenged insofar:

   a. It is not reasonable to claim that all AssetBank registered work is inherently conservative and a 3.2% adjustment down should be arbitrarily applied to all valleys. This report has noted that some valleys have low priority work included in their forward plan but in each case WaterNSW may well substitute higher risk work for some of these projects, following their customer consultations and annual reviews.

   b. Changes in scope are not likely to lead to a consistent 10% cost suppression. The current period's performance has shown an overall cost increase of 1.8% across delivered projects and in normal practice, WaterNSW will act to keep this variance as close to zero as possible across the entire investment portfolio.

   c. The strategic deferral of work applied in the current determination period was in response to a significant ACCC 2014 cost down of the StateWater proposal and the need to manage large projects across valleys. This situation is not likely to be repeated with Aither's own support for an increased level of investment and WaterNSW's current portfolio comprising work which can progress within each funding period except for the Keepit Dam.

4. Supporting the need to revisit the 25.6% factor was a review of the risk profile of proposed work per valley as understood from a 2016 release of AssetBank. This is an analysis of the same data provided to Aither albeit with specialist tools available to the current analysis. Some valleys simply cannot tolerate an arbitrary reduction which is applied evenly across the state since their individual risk profile is too high.

5. On the other hand, the risk profile of each valley does suggest the potential for deferring some work which may be a point of rationalisation between IPART and WaterNSW. This emphasises the need for WaterNSW to communicate the risk profile across each valley and use this in detail to justify the per valley investment portfolio.

6. It is up to WaterNSW for their specialists to challenge each of these findings with clear explanation from field audits such as included in this document. Anecdotal feedback from WaterNSW concerning the Aither review process indicated that some findings may have been adversely affected by specialists being away or documentation not to hand. This is not an acceptable outcome where the practical risk in the field needs to be managed.

Advice

1. The investment proposed by WaterNSW is reasonable and in general prudent with the following considerations:

    a. At times, insufficient evidence is provided of the technical basis for specific capital proposals such as asset health indices, risk profiles, field audits and other reports. In part this is due to the emerging maturity of WaterNSW as an asset manager.

    b. Front loading information in work lists which form the early part of the capital work flow pipeline is sparse and further consideration should be taken to capture technical considerations which lead to the early estimates of work and its costs.

    c. Business cases should be mature or at least sufficiently detailed to allow an early appraisal for work due to commence in the next 12 months to 2 years.

    d. Where business cases exist, WaterNSW should be able to provide these as evidence of rationale for expenditure and options analysis.

2. Aither's view is well founded based on the evidence they have documented as being provided, with the following exceptions:

    a. The determination of the factor of 25.6% for across valley reduction in asset renewal capital investment should be challenged by WaterNSW, noting that it may be reasonably claimed that a variance of 14.5% was achieved for the current determination period once the historical performance of 13.7% variance due to handling the low 2014 ACCC determination was excised as a one-off issue.

b. The Aither findings are a testament to the need for WaterNSW to improve its communication of the justification of work, noted in in the first item of this Advice.

3. Concerning WaterNSW's performance,

   a. WaterNSW demonstrates leading practice in the following areas:

      - Overall cost efficiencies being achieved through organisational restructure and corporate-level improvement;
      - Engagement with customers in detailed communication and aligning investment and future business activities with customer requirements as well as prudent risk management. While this report has challenged aspects of the communication, the processes which WaterNSW have implemented are highly commendable;
      - Field inspections and audits to establish and record asset health which is then used in project formation activities;
      - Risk analysis and the development of reasonable lower bound estimates of efficient levels of expenditure to remediate asset-related capability and condition risks; and
      - A strategic balance of investment across the valleys which is built from bottom-up considerations of risk but demonstrates a reasonable allocation of funds per valley based on water consumption and size of asset portfolio.

   b. WaterNSW is competent in the following areas:

      - Managing a project pipeline of work through effective business cases and options analysis to form reasonable requests for expenditure;
      - Managing down the variance in a capital work portfolio within a determination period;
      - Ensuring total OpEx expenditure on asset maintenance remains within tolerable budget boundaries representing at least better than average industry practice; and
      - Adjusting the strategic investment portfolio where appropriate, as shown in the Keepit Dam upgrades, funding for fish passages being reviewed and other key adjustments which may be clearly explained and justified.

   c. WaterNSW claims to be developing improved practices in the following areas:

      - Consolidation of projects into cost effective parcels;
      - Panel bids for competent parties to receive future work in an efficient manner;

- Refinement of existing asset health, risk and project concepts into an Asset Management Plan consistent with ISO 55001 to which the business is now certified; and
- Implementation of a continual improvement approach based on proven Lean methodology.

d. WaterNSW is recommended to improve in the following areas:

- Communication of the risk profile per valley to customers and relevant parties to explain the basis for outlay which is funded by these organisations;
- Consolidation and communication of technical considerations in the front-loading stages of the capital work flow pipeline, eg improved annotation of the work lists in AssetBank;
- Assurance that capital work scheduled to proceed within the next 12 months either has fully approved business cases or at least project documentation on rationale, options and preliminary work planning which allows a reasonable assessment of the proposed work.