Yarra Valley Water

Response to Productivity Commission's Draft Report "Australia's Urban Water Sector"

Yarra Valley Water - May 2011

Yarra Valley Water's Response to Productivity Commission's Draft Report

Introduction

Yarra Valley Water welcomes the opportunity to respond to the Commission's draft report on Australia's urban water sector. We support the vast majority of the Commission's recommendations and findings. We believe reforms implemented across Victoria in the past have positioned the Victorian water sector to effectively implement the high level reform vision articulated by the Commission, as many of the required building blocks are already in place. The Commission's report sets out a well-developed mosaic of interconnected reforms for the future of the urban water sector. We particularly note the Commission's comment that *"the largest efficiency gains are likely to be from achieving water security at lower expected cost, particularly better augmentation decisions and more efficient allocation of water resources."*[1] Large scale water supply augmentation projects will provide Melburnians with improved water security but with resulting increased water bills. This is a consequence of the most severe drought on record. The community's consciousness of the value of water has been clearly elevated – the prolonged water restrictions and the impact on our green open space, sports grounds and residential gardens has served to remind us of the critical role water plays in terms of liveability.

Our views on water reform are informed by customer research and continue to be anchored in achieving the dual outcomes of improved efficiency and greater customer satisfaction – refer Appendix 1 for a summary of this customer research.

We have provided further evidence-based information on the following matters which will assist the Commission in fine-tuning its recommendations:

- Governance
- Pricing / regulation
- The role of the future economic regulator
- Integrated water management
- Water supply and demand
- Institutional
- Roadmap

Appendix 2 contains a summary of our view on most of the recommendations contained in the Commission's report.

Governance

Government obligations

We believe improved governance and, more particularly, clarity of water policy objectives is the key reform opportunity for the major Australian urban water utilities. As recognised by the Commission, separation of the roles of policy, service provision and standards setting and regulation was a key element of the 1994 Water Reform Framework to provide more

[1] Page 250

economically efficient outcomes. Since the reforms of the 1990s, an increasing tangled web of regulatory arrangements has been created – refer Box 1 below for an informed view from the Chairman of Victoria's Essential Services Commission.

Box 1: Water industry governance – an informed view

I am very concerned about governance of the water industry — and here, let me differentiate very clearly between governance of the water industry from governance in the water industry.

The following is a list of Victorian agencies involved with the Victorian water industry; each creating its own set of incentives for individual water authorities. Similar lists could be generated for each State.

Victorian Competition and Efficiency Commission (Vic)
Department of Sustainability and Environment (Vic)
Department of Treasury and Finance (Vic)
Catchment Management Authorities (Vic)
Environment Protection Authority (Vic)
Department of Human Services (Vic)
Essential Services Commission (Vic)
Trade Measurement Victoria (Vic)
Minister for Water (Vic)
Treasurer (Vic)

Over and above this already extensive list, the last few years has seen various federal governments seek to involve Commonwealth agencies in the operations of the water industry for a host of supposed reasons. Here are some of the Commonwealth agencies that have managed to find themselves with an interest.

Department of Sustainability, Environment, Water, Population and Communities (Cth)
Minister for Sustainability, Environment, Water, Population and Communities (Cth)
Australian Competition and Consumer Commission (Cth)
Murray Darling Basin Authority (Cth)
National Standards Commission (Cth)
Australian Bureau of Statistics (Cth)
National Competition Council (Cth)
Environmental Water Holder (Cth)
National Water Commission (Cth)
Productivity Commission (Cth)
Bureau of Meteorology (Cth)
Infrastructure Australia (Cth)
CoAG Reform Council (Cth)

.....Now, keep in mind that each of these bodies creates its own set of incentives for individual water authorities and the water industry as a whole; incentives that may be intentional or inadvertent; formal or informal. It would be simple foolishness to believe that all these incentive frameworks could somehow be aligned. The laws of the universe do not work that way.

So what happens when incentive regimes are not aligned?
…The miasma of conflicting incentives playing upon the water industry is highly disruptive; and I greatly fear it is getting worse. If we remain on the path that we are on, then one day, maybe ten, maybe twenty, years from now, we will look at this sector and wonder how on earth we got ourselves into such a tangled state of governance and regulation. The water sector of 2024 will have come to resemble the health sector of today; a tangled bureaucratic mess.

Ben David, Ron (Chairman, Essential Services Commission), 2011, *Governance and the water sector. Are good intentions a good thing?*, 25 February, IWA/AWA Joint Conference, Healesville, pages 13-14

The Commission in its draft report has found (Draft Finding 11.2) that:

> *Government-owned water utilities are typically given a number of conflicting objectives by governments. Some objectives are inefficient (for example, utilities being required to reduce per capita consumption) and some are more appropriately assigned to other agencies. Often, little guidance about the relative importance of objectives is provided.*

We agree with this finding and, as an example, point to the Statements of Obligations that are issued to Victorian water utilities. In a recent review, the Victorian Competition and Efficiency Commission found[2]:

> *...some obligations in the Statement of Obligations are quite specific while others leave considerable room for interpretation. An example of a specific obligation is that retailers must meter all water use (Statement of Obligations, clause 18). Far less specific are obligations to implement programs for the sustainable use of recycled water (statement of obligations, clause 15.1(f)) and to develop and implement programs for responding to climate change and maintaining and restoring natural assets (statement of obligations, clauses 25.2 (a) and (b)).*

At the last price review, this ambiguity in obligations led to different views by water utilities on what was required to reduce greenhouse gas emissions to deal with climate change which the regulator was then required to resolve[3]:

> *During the last price review, quite a number of water authorities put forward proposals to reduce emissions. To a small extent this involved changes to 'production' processes, but more typically involved purchasing carbon offsets. In other words, and for completely noble reasons, these water authorities wanted to pay someone else to plant trees or collect methane from waste as a means of acquitting their own greenhouse gas emissions,. This quest for carbon absolution ran into millions of dollars and we were being asked to approve higher prices in order to cover these costs?*
>
> *What is a regulator to do with such proposals?*
>
> *There was no business case made for purchase of offsets. There was no robust testing of customers' willingness to pay for these offsets. There was no clear government requirement for the water authorities to offset their emissions.*
>
> *So let's be perfectly clear about this. In submitting these unsubstantiated propositions to the Essential Services Commission, it was just assumed that customers should pay for the beneficent intentions of their water authority.*

As a consequence of these ambiguities, the Victorian Competition and Efficiency Commission recommended[4]:

> *That:*
>
> - *A regulatory impact statement be prepared before a new or varied obligation (above a threshold level) is inserted in a statement of obligations*
> - *A publication of amended obligations required by the Minister within a regulatory period, be accompanied by a statement outcome(s) the obligation is intended to achieve.*

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[2] Victorian Competition and Efficiency Commission, 2008, *Water Ways: Inquiry into Reform of the Metropolitan Retail Water sector: Final Report*, February, p 150

[3] Ben-David, Ron (Chairperson, Essential Services Commission), 2010, *Governance and the water industry: The challenge of defining, creating and delivering value*, VicWater 2010 Annual Conference, 2 September 2010, pp 21-22.

[4] Victorian Competition and Efficiency Commission, op.cit. p 155

The Victorian Government supported this recommendation[5] - it is still work in progress to clarify these ambiguities in obligations as well as providing guidance on trade-offs decisions.

This lack of clarity in objectives has also been identified by the National Water Commission as a major barrier to efficient outcomes[6]:

> *The Commission considers that the absence of a coherent set of objectives is a major barrier to reform; it leads to policies that are ineffective and costly, policies that operate at cross-purposes and confusion between means and ends, and it undermines accountability and transparency.*

However, care should be taken to strike a good balance between providing clarity and allowing water utilities to seek the best solutions for the community. Objectives that are too tightly defined or overly prescriptive may create inefficient results by stifling the scope for innovation. They create a focus on achieving an outcome in a particular way rather than providing the best outcome for the customer. The framework needs to recognise that a balance can be achieved by increasing competitive pressures by introducing third party access, competitive pressures on the wholesale function, stronger comparative (yardstick) competition for retailers and comparative assessment of commercial performance via a commercially focused shareholders representative.

The Commission's recommendation on creation of a charter with Government (draft recommendation 11.2) with outcome based obligations is supported and should lead to a substantial improvement in economic efficiency and provide considerable benefits to our customers.

Corporate form and shareholder oversight

There are certain attributes of the current governance arrangements that Yarra Valley Water considers effective, including our current Corporations Law corporate form (in the context of being a State owned company). Corporations Law provides a strong foundation for good governance and a clear framework including director accountabilities and reporting disciplines. Essentially the organisation is compelled to abide by the same strictures as any other business. The Allen Consulting Group reports that this sets the scene for efficiency and good service[7]:

> *Corporations law form is the most likely arrangement to drive efficiency in government business enterprises and strong financial returns for government as shareholder, is the form most amenable to incentive regulation and is the form most likely to support good performance in service delivery.*

Yarra Valley Water believes the Corporations Law model works well and delivers efficiency and service improvements. As a business, Yarra Valley Water feels that it is under an obligation to seek efficiencies and innovations to deliver best value for its shareholder.

We note that the Commission has also expressed preference for this corporate form in its draft report (page 300).

In Victoria, water utilities are either statutory corporations (under *Water Act 1989 (Vic)*) or Corporations Law companies (under *State Owned Enterprises Act 1992 (Vic.)*). The Victorian

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[5] Victorian Government, 2008, *Water ways: Inquiry into Reform of the Metropolitan Retail Water Sector: Victorian Competition and Efficiency Commission's Final Report: Victorian Government Response*, July, p 13.
[6] Australian Government National Water Commission, 2011, Urban water in Australia: future directions, p ix
[7] Allen Consulting Group, 2005, *Governance of Government Water Businesses, A Best Practice Framework,* August, p. vii

Competition and Efficiency Commission examined the corporate form of Melbourne's three retail water companies in 2008 and recommended that the retailers be made statutory corporations under the *Water Act 1989* on the following grounds[8]:

- public accountability
- achieving the efficient delivery of the multiple objectives that the government is seeking from the sector
- the changing role of the water retailers
- operational considerations.

This conclusion is appropriate where it is accepted that water utilities should have multiple and somewhat blurred accountabilities and are representing the State. However, one of the Commission's key findings and draft recommendations is the need for State Governments to clarify the objectives of water utilities including trade-off decisions to improve economic efficiency. Given this, a Corporations Law company would be the better corporate form to achieve outcome based government obligations.

The Commission has listed on page 261 a number of characteristics of corporatised entities. These characteristics are broadly consistent with those of the Allen Consulting Group who suggested the following governance arrangements for Government Business Enterprises[9] (GBE):

- separation and clarity in roles across government so that each is well represented
- clear objectives for performance
- operational autonomy for Boards and managers to deliver on objectives
- focussed and effective monitoring to make Government Business Enterprises accountable
- effective performance by the government of its shareholder duties to underpin strong GBE performance.

The Corporations Law corporate form encourages clearer objectives and operational autonomy for the businesses within the water policy objectives set by government, and so is most likely to support good performance and improved economic efficiency. In its absence, government may have to pick up various accountabilities imposed by Corporations Law which may be administratively inefficient.

The need for all water utilities to have a shareholder focus has been recently endorsed by the Chairperson of the Essential Services Commission who stated[10]:

> *The nineteen water authorities operating in Victoria are each constituted with a shareholder Minister (or Ministers). In this regard, the water authorities, as operating entities, are answerable to their shareholders as well as their customers.*
>
> *Shareholder value is a far more concrete concept than customer value. It is defined in terms of return on equity. This is a well-established financial concept that has none of the vagaries of customer value…*

[8] Victorian Competition and Efficiency Commission, op.cit. pp 163-164
[9] Allen Consulting Group, 2005, op. cit., p 3
[10] Ben-David, R, 2010, op.cit. pp 18-19

> *Within the governance framework established for the Victorian water industry, the role of shareholder return is, or ought to be, central to each and every water authority. While a longer term view is well warranted in the water industry, this does not abrogate the responsibilities of directors and management to account for the annual return to the shareholder.*

Effective shareholder monitoring is a particularly important driver of efficiency and accountability in corporatised businesses, and may be a restraint on managerial discretion to pursue objectives other than specified by government. This is separate from the role the Commission identified in having an economic regulator overseeing reporting against the proposed Government charter contained in draft recommendation 11.2. The Victorian Competition and Efficiency Commission commented as follows[11]:

> *Private sector businesses are exposed to continuous shareholder and debt market scrutiny, with sanctions for poorly performing management that include takeover, receivership, insolvency and bankruptcy. These disciplines are largely absent from government owned businesses, and hence ways have to be found to perform this role in the public sector. It is notable that some jurisdictions have elected to set up separate entities to perform the shareholding role …Yarra Valley Water believes there should be 'greater shareholder oversight to ensure focussed and effective monitoring of performance'… The Commission endorses Yarra Valley Water's views about the importance of this role and in particular the need for robustness in the corporate planning review process and in the setting and application of dividend policy.*

There are examples in the United Kingdom[12] and New Zealand[13] whereby the shareholder function has been strengthened by the creation of a separate function within government that can provide advice on shareholder issues without also having responsibility for advising on policy or regulatory issues. Both models utilise corporate financial analysis skills and experience developed in the private sector. Appendix 3 contains further details in relation to these models. Yarra Valley Water supports the creation of a similar organisation to support more robust shareholding monitoring in the context of the overall governance framework for water utilities.

Pricing

Price regulation

In 2004, the price regulation function for Victorian water utilities was transferred by the Victorian Government to the Essential Services Commission. At that time a 'line in the sand' approach was adopted with a regulatory asset value established for each water utility having regard to such matters as customer price impacts and financial viability of the entity. Since that time prices have contained an appropriate return on all new investments considered by the regulator to be prudent and efficient. This response was consistent with 1994 Council of Australian Governments (COAG) Water Reform framework requirements and the 2001 National Water Initiative urban principles.

This economic regulation framework has been beneficial to customers in respect of:

- needing to create a business case for improved customer service outcomes through willingness to pay customer research

[11] Victorian Competition and Efficiency Commission, 2008, op.cit. p 166

[12] Shareholder functions are performed by a ring-fenced unit that draws on private sector expertise and reports to the Cabinet Office

[13] Separate Ministerial Posts – supported by a discreet unit within the bureaucracy (the "Crown Company Monitoring and Advisory Unit")
– have been created to perform shareholder duties

- improved internal planning processes particularly associated with investment planning
- more consultation with our customers and stakeholders on the outcomes we are planning to achieve and investment plans (these should be transparent)
- setting benchmark levels for efficient operating and capital expenditure
- breaking the nexus between government ownership of utilities and government setting prices.

The Commission has indicated that[14]:

> *Independent economic regulation of urban water utilities has been seen as important in the absence of competitive markets because the alternative has been high levels of interference in pricing. This has meant prices have often been set at levels well below cost recovery levels, possibly leading to inefficiently high water consumption and probably resulting in underinvestment and deferred maintenance.*

The Commission's draft recommendation 11.4 proposes moving from regulatory price setting to a price monitoring regime with continued pricing oversight. The Commission has stated that *'the role of price regulation has traditionally been to deal with concern about excessive pricing by infrastructure providers with market power"*[15]. We endorse this proposal on the basis that:

- at least in Victoria, price regulation has moved to a relatively mature state
- the Victorian Government implements an outcome focussed charter (as proposed in draft recommendation 11.2)
- the Victorian Government re-commits to full cost recovery in its water utility charter.

There has been recent public debate over the level of investment with publicly owned electricity companies and associated incentives – refer Box 2. These incentives can result in gold plating on one hand and under investment in renewal of infrastructure on the other hand. To date economic regulators have assumed the role of ensuring all investments in water and sewerage infrastructure are prudent and efficient so as to provide lower water bills to customers. If price regulation is to become less intensive, then there is a greater need for a strong shareholder function within government to ensure investments are prudent and efficient for the long term benefit of customers.

We seek clarification of how this recommendation might be applied to retailer-distributors and wholesale functions and how it might work in practice.[16]

[14] Page 273
[15] Page 99
[16] In Melbourne, regulation of wholesale prices and, in particular, review of costs is compromised by the absence of comparators, as exists in the retailer-distributor space.

Box 2: Investment incentives for government-owned businesses – electricity example

Gold plating of infrastructure, excessive reliability concerns and state ownership

For state owned network service providers, there is an unfortunate confluence of incentives that may be leading to significant over investment and gold plating of network infrastructure. As discussed earlier, state government owners may have an incentive to over invest because of the low cost of borrowing and tax allowance arrangements. In addition, political concerns about reliability of the network, about the ramifications of any failures, may further reinforce these incentives.

The existing financial incentives for state owned network providers to over invest coupled with the political cost of any failure in the network managed by a state owned company, have the potential to overwhelm any countervailing incentives to minimise operational costs.

The comparison of costs between Victoria, where the network providers are in private hands, and New South Wales and Queensland, where the network providers are in state hands, is at the very least a compelling piece of evidence to support this contention. While there are likely to be genuine differences between the states that explain some of these divergences, it is unlikely that these differences explain the majority of these divergences.

Commonwealth of Australia, 2011, *Garnaut Climate Change Review – Update 2011, Update Paper 8: Transforming the electricity sector*, pages 42-43

States blamed for power price surge

The chairman of the Australian Energy Regulator (AER), Andrew Reeves, said the lack of reinvestment by state-owned companies, combined with a dramatic increase in demand, had led to the "perfect storm" that resulted in power prices soaring across the country.

"In some ways we've been living off the investment of the past." Mr Reeves said…

"What's now happened, and the conjunction of timing, is we're looking at both replacement of assets as well as meeting higher demand coming in at the same time."

Australian Financial Review, *States blamed for power price surge*, 11 May 2011, p 1

Customer choice

The Commission's draft recommendation 7.3 recommends that more customer choice in tariff offerings should be available. This recommendation is consistent with Victoria's Ministerial Advisory Council which recently suggested[17]:

> *Opportunities are now emerging for customers to have greater choice in:*
>
> - *The water products on offer*
> - *The water charges they pay*
> - *Their level of service.*
>
> *Water users can therefore be much more informed about the water cycle and make decisions that best suit their budget and lifestyle. These choices can be made by individual customers or by local communities.*

For some time, we have been exploring options for customer choice with tariff offerings. Our current tariff structure for household customers has been in place since 2004. It comprises fixed charges for water and sewerage, a three-step (inclining block) usage-based charge for water and a sewage disposal charge (SDC). The SDC is usage-based but is calculated from water usage

[17] Victorian Government Department of Sustainability and Environment, 2011, Living Melbourne, Living Victoria roadmap: Ministerial Council for the Living Melbourne Living Victoria Plan for Water, March, p. 12

rather than measured directly. Customers and other stakeholders have raised a number of issues about the existing tariff structure:

- there is a perception that fixed charges make up too large a proportion of the bill so that customers have little incentive to save water
- the three-step water usage charge discriminates against large families and the necessity for a water conservation tariff is no longer critical
- the value of water is not reflected in the tariff
- the SDC is either not recognised as a variable charge or is too confusing
- some customers have interpreted inclining blocks to represent some form of peak or off peak charge
- tenants have been excluded from water efficiency measures because landlords have no incentive to install efficient appliances such as showerheads.

Our research and initial discussions with interested parties has indicated that the idea of offering some form of choice in tariffs has some merit and could contribute to improvements in customer satisfaction, although most parties recognise the difficulty in designing and implementing new tariff options (e.g. concerns regarding equity and simplicity).

Before proceeding, we decided that we would need to engage customers to determine their attitudes towards current tariffs and the concept of choice[18] through commissioned qualitative research. This took the form of discussion groups facilitated by a market research company. The groups comprised cross-sections of high and low users, urban and suburban residents and landlords and tenants. The research delivered some clear messages from customers:

- They are dissatisfied with the high fixed proportion of the bill and feel that they do not have adequate control. They want to see a move towards more variable charges,
- They are not aware of, or have little understanding of, sewerage charging,
- They are not clear about the role of parks and drainage charges[19],
- They are receptive to the idea of a choice of tariffs but are cautious about the form of the tariffs,
- They express a preference for restrictions and demand management over pricing solutions to controlling the supply/demand balance.

Further details on this customer research can be found in Appendix 4.

Developer charges

The Commission's draft finding 7.2 states "*there appears to be scope for efficiency gains in ensuring that developer charges better reflect the costs of service provision in new developments".* The Commission has sought further information on how developer charges are levied in each jurisdiction.

[18] We also proposed some possible choices to gauge their preferences.
[19] The three Melbourne retail water utilities levy a parks charge on behalf of Parks Victoria (annually) and a drainage charge on behalf of Melbourne Water (quarterly). These charges are included and shown on our bill together with water and sewerage charges.

Developer charges are a complex area with efficiency, equity and intergenerational issues. Some considerations are:

- investment in water and sewer assets is 'lumpy' with large and expensive assets most often designed to cater for current development and future growth
- new customers connect to existing assets, they do not connect to future assets
- some economic regulators believe that it is inefficient to include a contribution to existing assets with spare capacity (sunk assets)
- developers are principally concerned with equity and price advantages a competitor may receive.

Yarra Valley Water believes that developer charges provide important pricing signals for efficient servicing of greenfield sites and, most importantly, for out of sequence developments.

Major water and sewerage assets are often sized to provide capacity for distinct catchments and it can take many years of customer growth for the assets to be fully utilised. The value of the assets, less developer charges collected, is added to the water utility's regulatory asset base (RAB) and revenue is collected over the life of the asset through a return on and of assets. Consider the case of an asset with a 20 year life. Where developer charges reflect the cost of providing assets for growth, there is no increase in RAB and thus the water utility's general customer base does not contribute to the return on and of assets. Where developer charges are low and do not reflect the cost of providing the assets, the water utility's general customer base contributes to the return on and of assets. Existing customers, even though they will not use the assets, will contribute for the life of the asset whereas a new customer who connects to the asset in year 19 will only contribute for one year – all customers will contribute to the renewal / replacement of assets. Where a water utility has a large customer base, these additional contributions are likely to be minimal on a per customer base whereas there could be a significant impact on customers of a water utility with a small customer base. From an economic perspective, the water utility should be indifferent. However from a financial perspective, a small water utility may face difficulties in the short term having to fund the asset up front and receive the revenue over 20 years.

Answers to the Commission's information request questions are provided in Appendix 5.

The future economic regulator

The Commission has identified important future roles for economic regulators in the era of less intensive price regulation. These roles include price monitoring, oversight of water utilities compliance with their government charters and yardstick or performance comparisons.

In relation to performance reporting, the Chairperson of the Essential Services Commission recently commented[20]:

> *We are now in an era where customers are paying more and more each year for their water…As customers pay more, they will increasingly demand better value for money. This applies to individual customers as well as the community-as-a-whole. They will want to know what value they are getting for their money from their service providers.*
>
> *…open and transparent scrutiny, via public performance reporting, is one of the most important ways in which the community can be given assurance about value for money.*

[20] Ben-David, R, 2010, op.cit. p.9

Performance comparisons have served Melburnians very well since the current structure of the Melbourne water industry was established in 1995. Given the above comments, it is encouraging that regulators are thinking about reinvigorating this valuable tool for the benefit of the community but the timelines to progress this have been slow. A more challenging performance reporting regime should ensure greater transparency and scrutiny of the industry leading to economic efficiency gains and more innovation.

Moreover, economic regulators should periodically review the relevancy of their measures to ensure that the performance monitoring regime is kept up to date. We note that Ofwat, the economic regulator of the water industry in the United Kingdom, has a Service Incentive Mechanism that, in part, measures customer satisfaction[21]. A consistent customer satisfaction measure would be a major benefit to the current suite of largely infrastructure related measures.

Integrated water management

The Commission's draft finding 6.1 states:

> *Integrated water cycle management initiatives are often driven by the assumption that increased water reuse and recycling, and decreased reliance on centralised water supply systems are always in the community's interests. A better approach would be to seek to remove impediments to integration (such as the absence of appropriate property rights for wastewater and stormwater and deficiencies in the analyses, and community awareness, of costs and benefits), thereby allowing efficient recycling and reuse projects to be implemented.*

While we have never found unclear rights to be an impediment to integrated water management, we recognise an improved property rights regime for wastewater and stormwater is worth pursuing. The Victorian Ministerial Advisory Council has commented[22]:

> *Integrated water cycle management provides multiple benefits to the community. These include improvements to downstream water quality, reduced urban heat, reduced risk of flooding and improved urban amenity. These benefits accrue to the general public, rather than water providers and users, and are not often considered in investment decision-making.*

In terms of 'Integrated Water Management', we are implementing a number of diverse servicing solutions aimed at achieving better outcomes from a customer, economic and environmental perspective. Each of these perspectives are dependent on the unique circumstances associated with customer expectations and geographic location.

The critical breakthrough in identifying better alternative servicing solutions has been achieved through assessing options from a total community cost perspective and using Life Cycle Assessment (LCA) to quantitatively compare the environmental impacts of alternative solutions – while the community has been calling for alternative solutions to solve water shortages, LCA provides the scientific data that enables decision makers to choose the optimal balance between those alternatives (including recycled sewage, stormwater and rainwater) and traditional sources of water. This has shown us that the environmental impact associated with using water from any part of the water cycle is dominated by three factors:

- water taken out of the water cycle for potable use

[21] Ofwat, 2009, *Service incentive mechanism – a consultation on moving forward from the overall performance assessment*, August

[22] Victorian Department of Sustainability and Environment, 2011, op. cit., p 15

- greenhouse gas emissions
- nutrients discharged back into rivers from urban stormwater and sewage treatment plants.

Our total community cost model leverages off the LCA work by attributing a monetary value to each of the three factors listed above. These then legitimately form the dominant externalities that are included in our total community cost model. These externalities are then incorporated into our Net Present Value comparisons of all possible supply options. This ensures that traditional and alternative options are compared fairly because they both incorporate full community costs, not just the costs of the water utility.

Yarra Valley Water's Total Community Cost Model often shows the lowest community cost option results in higher costs for the water utility. For most utilities this is a major barrier to adoption of lowest community cost outcomes. A key policy question is "who should pay for value of the externalities - the utility (being the utility's customers) or the government (representing the broader community)?" Markets could play a role in valuing these externalities.

Case studies showing our community cost approach are provided in Appendix 6. Our experience in pursuing these has demonstrated that:

- Alternative servicing options are much more viable in new growth areas where economies of scale can be exploited and decentralised systems can be provided with their long term viability assured through centralised management.
- If desalination is the next augmentation to supply, alternative servicing utilising recycled water and stormwater generally delivers a better community outcome. The quantum of the outcome is dependent on the geographic, environmental and social circumstances that are unique to the project being considered. If desalination is not the next augmentation and cheaper sources of water are available, the viability of alternatives diminish.
- In circumstances where higher direct costs to Yarra Valley Water will be incurred but the benefits accrue to a much broader set of beneficiaries, proceeding with the project has been conditional on an injection of external funding. To date this has come primarily from the Federal Government's stormwater fund.
- While there are policy gaps and institutional issues to deal with, these have not been a major hurdle to pursuing alternative approaches (aside from the external funding aspect) – we believe this is primarily due to Yarra Valley Water having a very clear and aligned strategy regarding customers and the environment, and working with relevant stakeholders on the basis of achieving common goals.
- While stormwater offers strong potential to contribute to servicing new developments on the urban fringe, physical limits on the availability of large scale stormwater storage facilities in existing metropolitan suburbs means that stormwater is unlikely to make a material contribution to overall security of the potable water supply (refer Blackburn case study in Appendix 5).

Our community costing framework has evolved as we have applied it to real projects in partnership with key stakeholders. This has been invaluable in fully understanding the implications of alternatives. We welcome the scrutiny of our least community cost model by others for the benefit of all.

The least community cost approach is gathering momentum and Yarra Valley Water has been proactive in the promotion of our approach including via our submission to the Victorian Government's Ministerial Advisory Council. A recommendation in the resulting report has reflected our views and has identified that decisions should maximise community benefits[23]:

> *1. Water resources should be managed for multiple benefits*
>
> *Decisions will be made to achieve socially optimal water investment, which involves maximising the benefits to the community at the least cost to the community. A comprehensive framework for investment decisions will be used to fully reflect and quantify, wherever possible, the societal costs and benefits so that informed, robust and transparent decisions can be made.*

In April 2011, Frontier Economics produced a report for the National Water Commission entitled *"Externality pricing in the Australian water sector"* in which it is recognised that externalities, where they are material, should be considered in the assessment of servicing options[24]. This approach mirrors the Yarra Valley Water approach to community costing and Yarra Valley Water can attest to the materiality of these externalities.

Water supply demand balance

The Commission has recognised the impact of drought over the most of Australia during the past decade or more and that approaches to managing the water supply demand balance need to change. The commission needs to recognise that decisions relating to water supply augmentations are fundamentally underpinned by a risk assessment. The water industry, like no other, has to deal with the vagaries of weather and climate change and has been faced with the simple choice of either waiting for rain or committing to the security of new sources of supply. While desalination plants have put unprecedented pressure on water prices this pales in comparison with the economic, social and environmental cost of a major city running out of water. Australian capital cities are still growing and the new desalination plants will inevitably make an important contribution to the security of supply in our major cities.

We now have the opportunity to adopt and apply the 'real options' approach proposed by the Commission.[25]

A conceptual framework has been drafted based on a real options type approach - an outline of our initial thinking is contained in Appendix 7.

Institutional

In our response to the Commission's Issues Paper, we outlined our experience with the current water industry structure in Melbourne[26]. We also outlined our evidence on economies of scale and scope in the water industry[27]. Overall, we endorse the Commission's discussion of the merits of Reform Option 4 (Horizontal separation of retail-distribution), which is broadly consistent with the Melbourne water industry structure. However, as Option 4 is considered by

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[23] Victorian Government Department of Sustainability and Environment, 2011, op.cit., p 9
[24] Australian Government National Water Commission and Frontier Economics, 2001, *Externality pricing in the Australian water sector*, Waterlines Report Series No 43, April 2011.
[25] Page xxvi
[26] Yarra Valley Water, 2010*, Response to Productivity Commission's Issues Paper "Australia's Urban Water Sector"*, November, pages 8-12
[27] Ibid, p 11-12 and Appendix 2.

the Commission to be a refinement of Option 3, it should be noted we do not have a clear view regarding the costs/benefits of disaggregation at an individual wastewater treatment plant level (as described in Option 3). As a retailer-distributor, we currently own and operate several small local sewage treatment plants (STPs), and some of these are being used to provide various classes of recycled water to customers. We would be interested in understanding the Commission's view as to the viability of a competitive market at this level. We agree with the Commission's draft finding 12.2 that the benefits of a fully competitive, decentralised urban water market model (Option 5) are unlikely to exceed the costs.

Aside from disaggregating wastewater treatment, the current Melbourne model would need to evolve further to fully meet the Commission's Option 4 model. The main two aspects are in relation to each retailer-distributor having its own responsibility for security of supply (rather than joint responsibility with the other two retail water utilities) and the establishment of a Water Grid Manager that would be responsible for integrating long term planning across all water utilities.

The Commission has proposed "*each retailer-distributor … be independently responsible for securing sufficient services to meet customer demand and a security of supply requirement (so each retailer-distributor has an obligation to serve customers in their geographic area)*"[28]. The Commission concluded that *"the presence of multiple buyers (retailer-distributors) is expected to drive greater competition and innovation by service providers."* [29] Currently, the three Melbourne retailer-distributors are jointly responsible for Melbourne's overall security of supply including through having 'pooled' bulk water entitlements.[30] To transition to the Commission's Option 4 model, the 'pooled' bulk entitlements would need to be unbundled to provide each water utility rights to water from the various water sources and to the intertemporal carryover storage in Thomson Dam. The Melbourne retail water utilities have previously undertaken joint studies into how separation of the bulk entitlements could be undertaken through a market mechanism so that water values for the various sources and for intertemporal storage are determined. However, implementation will be complex. In any event, we fully support the Commission's recommendation and its goal of competition and innovation.

The Commission also stated in relation to Reform Option 4[31]:

> *…a distinguishing feature of option 4 would be the establishment of a single, network transmission entity (or water grid manager) that would provide all transmission (shared) network services;*
>
> - *Potable water transmission services*
> - *Wastewater transmission services*
> - *Stormwater transmission services.*

We support the establishment of such an entity. In Appendix 8, we have outlined our view on the characteristics of this body. We also note that the Victorian Ministerial Advisory Council has proposed a body with many of these features[32].

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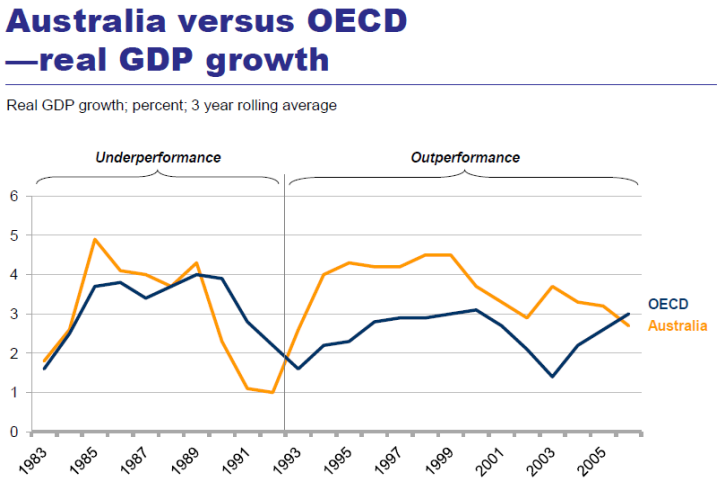
[28] Page 350
[29] Page 361
[30] Through 'pooled' bulk entitlements for each water source with each retailer-distributor having an undefined share.
[31] Page 349
[32] Such as preparing a 'statement of opportunities' that covers resource availability and demand for services and reporting on system operation constraints, including network capacity and environmental constraints – refer Victorian Government Department of Sustainability and Environment, 2011, op. cit. p. 17

The Commission has suggested a number of other worthy features for the Option 4 model including:

- The development of a 'bulletin board' system (or a variation of) – as exists in the gas market – to help facilitate trade in services and capacity by providing all retailer-distributors with ready access to information on available water and network capacity.
- Large water users able to operate as independent buyers and sellers of water – the Melbourne water industry has prepared a report on this matter to identity the net benefits and issues [33]. This would be consistent with the creation of a third party access regime which we support as it would lower water prices to customers.

Road map

In our submission to the Commission's Issues Paper, we outlined our view that water reform was a significant item for Australia's microeconomic reform agenda[34]. The 1995 National Competition Policy Reforms are seen to have underpinned an era of out-performance in Australia's growth prior to the onset of the Global Financial Crisis and the current "resources boom"– refer figure and Box 3 below. However, immediately prior to the Global Financial Crisis Australia's out-performance in growth had stalled.



Source: Hilmer, Fred, ACCC Regulatory Conference Presentation: Learning from Success – Competition Policy and Success, 29 July 2010

[33] Farrier Swier Consulting, 2007, *Feasibility Study and Recommendations: Large User Water Market: Final Report*, 9 November

[34] Yarra Valley Water, 2010, *Response to Productivity Commission's Issues Paper "Australia's Urban Water Sector"*, November, p 20

Box 3: Reform benefits

The benefits of reform in public services can be significant. Past eras of microeconomic reform – notably the national competition policy reforms that started in the mid 1990s – have demonstrated that the introduction of competition can deliver significant productivity improvements, greater choice and better customer service in areas of the economy not previously subject to market discipline. In 2005, the Productivity Commission estimated that the productivity and pricing reforms implemented as a result of the National Competition Policy agenda resulted in a sustained increase in Australia's real gross domestic product of 2.5 per cent above what it would otherwise have been.

Victorian Government, 2011, *2011-12 Budget Paper No 2, Strategy and Outlook*, May, page 18

A notable feature of this era of out-performance was the delivery of the Council of Australian Governments' 1995 National Competition Policy package of measures to implement the Hilmer proposals and to meet reform commitments in the areas of electricity, gas, water and road transport. The water reform package incorporated the 1994 COAG endorsed strategic framework for the efficient and sustainable reform of the Australian water industry. In Victoria, a complementary structural reform package was implemented in 1995 that included disaggregation of the former Melbourne Water into a wholesaler, three retailer-distributors and a separate parks entity. The Melbourne reforms resulted in major efficiency gains and significant improvements in customer service[35].

The Commission's proposals, if implemented, would make a significant contribution to improving productivity across Australia's urban water sector and, importantly, contribute to an increase in national income. It is for this reason we believe that the Commonwealth Government needs to provide incentives to the States to deliver these urban water reform proposals in a timely manner – similar to that which occurred with the urban water reforms of the 1994 COAG Water Reform Agenda. Otherwise the costs and barriers to implementation are likely to be greater than the perceived benefits.

The Commission's draft recommendation 14.1 stated that the highest priority for reform was the implementation of reforms to policy, governance and institutions. This area is the responsibility of State Governments. We agree with this proposal and that it should be able to be completed within a period of 18 months.

[35] Victorian Competition and Efficiency Commission, 2008, *Water Ways: Inquiry into reform of the metropolitan retail water sector: Final report*, February, page 29.

APPENDIX 1

Customer research snapshot

There is no view that is common across the entire customer base, and current attitudes have been strongly influenced by the fact that the key interaction between water utilities and customers in recent years has concerned water restrictions and water conservation. Nevertheless, there are some general conclusions that can be reached from recent water sector market research and customer feedback:

- Water has shifted in recent years from what was once a low involvement category to one that is high on the community's agenda. There is a greater emotional connection with water and the community places a much higher value on water than in the past.
- Over the years of drought, an aspect of psychological burden has emerged in terms of water – some customers miss the freedom of having no rules, the flexibility of performing tasks when desired, and the freedom from worry about a water constrained future.
- Water conservation has been embraced and behavioural change in the use of water has occurred – although favourable attitudes to water conservation do not always translate to action, with key barriers being cost and convenience.
- Communities are cautious about the future in terms of water availability / security.
- Customers would like more control over water bills, that is, the ability to materially influence the size of their bill through their own water saving actions.
- The perception of the cost of water has shifted dramatically in a short period – customers previously considered the cost of water to be too cheap. Now, combined with the effects of other cost of living increases (especially energy), there are concerns being expressed regarding the future price of water. This is a national trend following significant investments in new water supplies and in the context of some recent recovery in dam levels due to high rainfall.
- There is a predisposition to alternative supply options (i.e. stormwater re-use, rainwater capture and recycling sewage) – however there is a knowledge gap regarding the costs, environmental aspects and health considerations in relation to alternatives.
- Customers want choice, but not too much choice – customers are adamant that they do not want to be presented with too many options.
- There is a strong desire for fairness and equity regarding water use and some kind of incentive system to ensure that those doing the 'right thing' are rewarded.
- There is some support for water restrictions, particularly from a fairness and equity point of view – but this has not been tested in the context of providing a holistic perspective on the community impacts of restrictions (eg unplayable sports grounds, loss of plants in residential gardens, loss of jobs in nursery industry etc)
- By and large, and in the context of cost of living pressures, customers have a low willingness to pay for increases in service levels
- In terms of value, the most important aspect of service provided from the water utility is the safety and appeal (colour, odour, taste) of water, followed by the availability of sewerage services, above what may be defined as "add-ons" such as water conservation programs, call centre services and bill payment options.

APPENDIX 2

Yarra Valley Water comments on Productivity Commission's draft recommendations and findings

Recommendation/ Finding	YVW position
Chapter 3 – Objectives for the urban water sector	
DRAFT RECOMMENDATION 3.1	AGREE - refer page 11 and Appendix 6 for further details.
Chapter 4 – The role of governments	
DRAFT FINDING 4.1	AGREE - refer Governance section on page 1 for further details.
Chapter 5 – Improving regulation of the urban water sector	
DRAFT RECOMMENDATION 5.1	AGREE
DRAFT FINDING 5.1	AGREE We agree that Government is responsible for dealing with broader affordability issues. The Victorian Government has a concession scheme which provides assistance to low income and disadvantaged water users in the Victorian water industry and community service obligation payments are made to the water utilities for this purpose. The water utilities can assist affordability by vigorously pursuing efficiency to keep pressure off prices in the context of a full cost recovery obligation. The water utility's charter with Government should require each water utility to adopt the good practices from independent price regulation such as a willingness to pay to substantiate increases in customer service standards, stakeholder consultation and transparent investment planning. Water utilities need to have regard to affordability issues affordability issues particularly in transitioning tariff structures and increasing prices.
Chapter 6 – Supply of water, wastewater and stormwater services	
DRAFT RECOMMENDATION 6.2	GENERALLY AGREE Government funding is still required for research and development and trial projects where the results are made available to the whole water industry.
DRAFT FINDING 6.1	AGREE - refer Integrated Water Management section on page 11 for further details. Also refer to our case studies on Integrated Water Management (IWM) in Appendix 6.
Chapter 7 – Pricing of water and wastewater	
DRAFT FINDING 7.1	AGREE IN PRINCIPLE

Recommendation/ Finding	YVW position
	This needs further work re how it might be implemented. Any changes in the bulk water supply cost profile should be able to be reflected in retail pricing. This could be linked to a transparent real options plan – refer Water supply demand section on page 13 and Appendix 7 for our proposed water security framework.
DRAFT FINDING 7.2	AGREE - refer Pricing – developer charges section on page 10.
INFORMATION REQUEST	Responses to specific questions are contained in Appendix 5.
DRAFT RECOMMENDATION 7.1	AGREE Metering of all new single and multi-unit developments already applies in Melbourne. Water charges should be based on usage to ensure equity.
DRAFT RECOMMENDATION 7.2	ASPIRATIONAL OBJECTIVE – subject to no overall increase in costs borne by tenants. If there is no impact on tenants (i.e. rents decreased by increased amount) it should implemented. It should be recognised that if there was no offset to rent payments such a proposal would result in tenants' bills more than doubling and may have cost impacts (e.g. increased bad debts) which would need to be borne by the whole customer base.
DRAFT FINDING 7.3	AGREE IN PRINCIPLE There will be customer impacts from eliminating IBT and so tariffs may need to be transitioned over one or more regulatory periods. The "substantial efficiency gains" from eliminating IBT have not been demonstrated in the report. Nevertheless we do favour simplicity.
DRAFT FINDING 7.4	UNDECIDED In Melbourne, we already have differential pricing between retailers – so we have locational pricing for each distributor-retailer (to an extent). We do not see any advantage in disaggregating price further. Differential pricing maybe appropriate where there are different networks within a region, otherwise we would favour network pricing for wholesale functions. We are concerned that further unbundling by each distributor-retailer will cause unnecessary impacts on customers. The proposal still has to pass the fairness/reasonableness test for customers.
DRAFT RECOMMENDATION 7.3	AGREE - refer Pricing – customer choice section on page 8 and also Appendix 4.
DRAFT FINDING 7.5	AGREE – the statement is technically correct. Governments have had other objectives besides economic efficiency e.g. a

Recommendation/ Finding	YVW position
	three block tariff has contributed to the achievement of a water conservation objective.
INFORMATION REQUEST	Sanford V. Berg, Director, Public Utility Research Center, University of Florida has set out the following objectives for water pricing which form a sound and robust set of principles. These are[36]: • revenue adequacy, • revenue stability and predictability • price stability and predictability • economic efficiency in supply and consumption • recognition of positive and negative externalities • fairness in apportionment of total cost of service • avoidance of undue discrimination • economic efficiency in innovation • simplicity • certainty • convenience of payment • economy of collection, • understandability • acceptability • feasibility • freedom from controversy as to proper interpretation.
Chapter 8 – Non-price demand management	
DRAFT FINDING 8.1	AGREE - refer Water supply demand balance section on page 13 and Appendix 7.
DRAFT RECOMMENDATION 8.1	AGREE - refer Water supply demand balance section on page 13 and Appendix 7.
DRAFT FINDING 8.2	AGREE
DRAFT RECOMMENDATION 8.2	AGREE
DRAFT FINDING 8.3	AGREE However, in our customer research on tariff choice (refer Pricing – customer choice section on page 8 and Appendix 4), we found that customers expressed a preference for water restrictions and demand management over pricing solutions to controlling the supply/demand balance.

[36] Berg, Sandford V.,1999, Basics of Rate Design: Pricing Principles and Self-Selecting Two-Part Tariffs, in *Infrastructure Regulation and Market Reform: Principles a.* ,1 *Practice.* Editors Margaret Arblaster and Mark Jamison. Austrailian Competition and Consumer Commission: Melbourne, Australia. 1998.

Recommendation/ Finding	YVW position
Chapter 9 – Achieving affordability and consumer protection objectives	
DRAFT FINDING 9.1	AGREE
DRAFT FINDING 9.2	AGREE
DRAFT FINDING 9.3	AGREE There is scope for better targeting of the current concessions arrangements. Ideally the concession should cover at least the fixed component of the water bill so that low income and disadvantaged customers then have total control over their bill via the amount of water they use.
DRAFT FINDING 9.4	AGREE
DRAFT RECOMMENDATION 9.1	AGREE
DRAFT FINDING 9.5	AGREE We strongly support the Commission's finding. We have one of the most comprehensive utility hardship schemes In Australia. Our hardship scheme was established based on a business case and the need for such a scheme has been recognised in the Essential Services Commission's Customer Service Code[37].
DRAFT RECOMMENDATION 9.2	AGREE In Victoria, these two arrangements are already in place. We have: • A requirement to belong to the Energy and Water Ombudsman Victoria scheme • A Customer Service Code issued by the Essential Services Commission. Both arrangements work well. These arrangements provide sound customer protection against any inappropriate behaviour by water utilities.
DRAFT RECOMMENDATION 9.3	AGREE
Chapter 11 – Institution-centred reform	
DRAFT FINDING 11.1	AGREE

[37] Essential Services Commission, 2010, *Customer Service Code; Metropolitan Retail and Regional Water Businesses*, October, pp 9-10.

Recommendation/ Finding	YVW position
DRAFT RECOMMENDATION 11.1	AGREE
DRAFT RECOMMENDATION 11.2	AGREE
DRAFT FINDING 11.2	AGREE
INFORMATION REQUEST	Refer Governance section on page 1 for further details
DRAFT RECOMMENDATION 11.3	AGREE - refer Governance section on page 1. Many of the attributes outlined in this recommendation already exist in Victoria.
DRAFT FINDING 11.3	AGREE – refer Governance – corporate form and shareholder oversight section on page 4 and Appendix 3.
DRAFT RECOMMENDATION 11.4	AGREE - Refer price regulation section on page 6.
DRAFT FINDING 11.4	AGREE Yarra Valley Water has a customer consultative committee which discusses proposals that impact customers. This group is representative of our customer base and we have found it to be an excellent sounding board. We also conduct a wide range of ongoing customer market research to inform our service offerings and communications.
DRAFT RECOMMENDATION 11.5	AGREE
DRAFT RECOMMENDATION 11.6	AGREE
Chapter 12 – Structural reform options for large urban centres	
DRAFT FINDING 12.1	AGREE
INFORMATION REQUEST	We have already supplied our available evidence in our response to the Commission's Issues Paper.
DRAFT FINDING 12.2	AGREE These five options generally form the range of available structural options. It is noted that the Melbourne model is close to essentially Option 4 and has been preferred by the Commission for large urbans.

Recommendation/ Finding	YVW position
INFORMATION REQUEST	The Melbourne model has been characterised by: • Strengthening accountabilities for water and sewerage service delivery (e.g. separation of wholesale and retail functions; this has resulted in a strong focus on customers by the retail utilities) • Gradual strengthening of commercial disciplines (e.g. introduction of skills based Boards, tax equivalent regimes and dividends, contracting out of non-core activities; these have delivered strong corporate governance and significant efficiency gains) • Transition to independent regulation, with greater transparency on decision making and scrutiny of performance (e.g. independent environmental and drinking water quality regulation, price regulation and cost based pricing, transparent disclosure and performance reporting; these have created very strong discipline in long term planning and customer consultation) • Creation of explicit obligations in customer service and environmental performance (e.g. customer charters; this has provided clear, unambiguous obligations on water utilities) • Introduction of elements of competition (e.g. comparative competition regime; this has provided a major spur for innovation and continuous improvement) • Improvements in planning (e.g. Sustainable Water Resource Strategies; striking the right balance between supply and demand) and water allocations (e.g. Bulk Water Entitlements to retail water utilities; potentially facilitating efficient water transfers based on sound economic principles).
Chapter 14 – Implementing reform and monitoring progress	
DRAFT RECOMMENDATION 14.1	AGREE
DRAFT FINDING 14.1	AGREE
INFORMATION REQUEST	AGREE - refer Road map section on page 15
DRAFT RECOMMENDATION 14.2	AGREE
DRAFT FINDING 14.2	AGREE
INFORMATION REQUEST	The most crucial reform is improved clarity of Government obligations on water utilities. This reform should be able to be delivered within 18 months. The full package of reforms suggested by the Commission should be able to be delivered by 2015.
DRAFT FINDING 14.3	UNDECIDED It is not exactly clear that “governments will benefit”. Certainly we expect customers will benefit, but the benefits as articulated may not be sufficiently compelling for state governments to act. We believe incentive payments to the

Recommendation/ Finding	YVW position
	States are required to achieve the PC's recommendations and ensure Australia's productivity is increased in a timely manner.
DRAFT RECOMMENDATION 14.3	AGREE
DRAFT RECOMMENDATION 14.4	AGREE

APPENDIX 3

Shareholder oversight

Water utilities and the State Government (as shareholder) would benefit from rigorous oversight of utility operations by a dedicated shareholder representative. This happens frequently in private industry where the holding company undertakes regular, rigorous reviews of the subsidiary company. There are two very good examples of effective shareholder management of Government Business Enterprises:

- Shareholder Executive (United Kingdom)
- Crown Company Monitoring Advisory Unit (New Zealand).

In summary this type of oversight would have a number of benefits:

- Provides government with confidence that utilities are operating efficiently and that they are applying government policy consistently and effectively
- Ensures that government, not utilities, makes key trade off decisions on competing social, environmental and economic matters
- Assists in reinvigorating comparative competition and gives the government meaningful comparisons that will encourage continuous improvement in all aspects of water utility operations.

Examples of Best Practice Shareholder Management for GBEs

United Kingdom Shareholder Executive[38] – Overview

The Shareholder Executive was created in September 2003 to improve fundamentally the government's performance as a shareholder in government-owned businesses and to provide a source of corporate finance expertise within government. Its remit covers 27 businesses, from large well known companies such as the Royal Mail to smaller trading funds like the UK Hydrographic Office. Its role is to be a proactive, intelligent shareholder, working with government departments and management teams to help government-owned businesses perform better. It advises Ministers and officials on a wide range of shareholder issues including objectives, governance, strategy, performance monitoring, board appointments and remuneration.

It aims to create a climate of ownership that, while challenging, is genuinely supportive, and provides the framework for these businesses to be successful.

Objectives

The Shareholder Executive's overarching objective is to be an effective shareholder of businesses owned or part-owned by the government. Its specific objectives are to:

- Ensure each business delivers sustained positive returns, and returns its cost of capital within the policy parameters set by government
- Increase by £1BN in the three years to 2007 the value of the core portfolio of businesses owned by government, within a framework of clearly defined policy, customer and regulatory objectives
- To provide, corporate finance expertise across government.

[38] Source: http://www.shareholderexecutive.gov.uk/

Approach
To deliver these objectives, the Shareholder Executive take as a fundamental principle the need for government to act as an engaged and informed shareholder. It uses a system based on the private equity model of share ownership, adapted to recognise the longer-term nature of the government's financial interests and the non-commercial policy objectives it sets.

Its approach is based on: a clear governance framework for each company based on best practice; clarity on commercial, policy and customer objectives for each business; management held to account for delivering the government's objectives and the raising of skills and professional staffing of shareholder teams.

New Zealand Shareholder Representative: Crown Company Monitoring Advisory Unit (Ccmau)[39] – Overview

CCMAU was established in 1993 to provide high-quality advice to shareholding Ministers on company performance and to recommend qualified persons to sit on the boards of these companies. It:

- Monitors the government's investment in companies owned by the Crown
- Assists with the appointment of directors to Crown company boards
- Provides performance and governance advice to shareholding Ministers.

CCMAU provides advice in the following areas:

- Monitoring – reporting on company business plans, performance against targets, and sectoral trends
- Ownership – advising on strategic issues, investment and diversification opportunities, and the impact of government policy
- Governance and appointments – identifying and screening potential directors, managing the appointments process, and promoting corporate governance best practice
- Ministerial servicing – managing issues and drafting replies to correspondence, parliamentary questions, and requests under the Official Information Act 1982.

CCMAU is attached administratively to the Treasury but is an operationally independent unit.

[39] Source: http://www.ccmau.govt.nz/

APPENDIX 4

Customer choice with tariffs

Our current tariff structure for household customers has been in place since 2004. It is made up of fixed charges for water and sewerage, a three-step usage-based charge for water and a sewage disposal charge (SDC). The SDC is usage-based but is calculated from water usage rather than measured directly. Customers and other stakeholders have raised a number of issues about the existing tariff structure:

- There is a perception that fixed charges make up too large a proportion of the bill so that customers have little incentive to save water
- The three-step water usage charge discriminates against large families and the necessity for a water conservation tariff is no longer critical
- The value of water is not reflected in the tariff
- The SDC is either not recognised as a variable charge or is too confusing
- Tenants have been excluded from water efficiency measures because landlords have no incentive to install efficient appliances such as showerheads.

We suggested that it might be attractive to offer a choice of tariffs to increase individual and overall customer satisfaction[40]. Experience in other sectors suggests that a one-size-fits-all approach to pricing can lower levels of customer satisfaction. A tariff can be acceptable to a large proportion of the customer base but still leave a significant number dissatisfied. For example, while some customers want more control over their bills through a greater proportion of usage-related charges, others may prefer the certainty of a larger fixed element. Ideally, customers could choose the option that best matched their needs. Whether or not this is practical remains to be seen.

Initial discussions with interested parties indicated that the idea had some merit. Stakeholders representing different constituencies had their own preferences. We decided that we would need to engage customers to determine their attitudes towards current tariffs and the concept of choice. We also proposed some possible choices to gauge their preferences.

We commissioned qualitative research to examine customer views on the issues. This took the form of discussion groups facilitated by a market research company. The groups comprised cross-sections of high and low users, urban and suburban residents and landlords and tenants. The groups were presented with alternative standard tariffs and possible optional tariffs and asked for their reactions and preferences.

The standard tariffs for consideration were:

- A wholly fixed sewerage charge and wholly variable water charge
- A water tariff with a low price first block for “essential” usage and a second block with a much higher price for “discretionary” usage, and
- A tariff targeted at large families (5+ members) on concessions whose bill would be pegged to the average bill.

The optional tariffs for consideration were:

[40] The Age, Melbourne, 22 September 2010, p1.

- An unrestricted tariff where customers can pay a premium to avoid restrictions (but not permanent water saving rules)
- A "dam-level" tariff where the price of water rises as the level falls and vice versa, effectively a scarcity tariff
- A community tariff where a contributory portion of the bill goes towards maintaining water supply for sportsgrounds
- A green tariff where a contributory portion of the bill goes towards maintaining wetlands, river flows during drought and/or to offset greenhouse gas emissions.

The research delivered some clear messages from customers:

- Customers tend to look at the "bottom line" on the bill rather than the composition of the charges, unless there is some stimulus such as a higher than expected bill,
- They are dissatisfied with the high fixed proportion of the bill and feel that they do not have adequate control. They expressed preference for tariffs that emphasise the variable element and want to see a move towards more variable charges,
- They are not aware of, or have little understanding of, sewerage charging,
- They are not clear about the role of third party charges on our bill (i.e. parks and drainage charges),
- They are receptive to the idea of a choice of tariffs but are cautious about the form of the tariffs,
- Customers are still committed to saving water and this influences their perception of charges
- They express a preference for restriction and demand management over pricing solutions to controlling the supply/demand balance
    - Scarcity pricing polarises opinion. Some customers recognise the objective but other are concerned about the uncertainty it may introduce
    - The idea of an unrestricted tariff gets a mixed reaction with some finding it attractive but others concerned about the negative message on water conservation and possible divide between 'haves' and 'have-nots'.

While there is support for changes to the current tariffs, there are practical issues that mean we will have to exercise caution in pursuing any proposals. In particular, we will need to carefully assess the impact of any distributional effects of tariff changes. It is likely that we will carry out further quantitative research to determine the support for various tariff proposals.

APPENDIX 5

Developer Charges

Context

The Commission's draft report found:

DRAFT FINDING 7.2

There appears to be scope for efficiency gains in ensuring that developer charges better reflect the costs of service provision in new developments. Upfront charges should be used where the incremental costs of development are well established and, in the case of urban infill, benefits do not accrue to incumbents. Where the benefits also accrue to incumbents, costs should be spread across all users through rates, taxes or the fixed part of a two-part tariff for water and wastewater.

INFORMATION REQUEST
The Commission is seeking further information on how developer charges are levied in each jurisdiction, for both greenfield and urban infill developments. Do these currently provide adequate signals on the costs of servicing new developments? To what extent should developer charges be set periodically on an 'across utility' basis, or be specific to the development in question? Would more development specific charges, especially in high cost areas, encourage greater innovation? Would it be better for developers to build the required infrastructure according to standards set by the utility? If so, what issues would need to be addressed to operationalise this? What are the main impediments to introducing more efficient developer charges?

Response

Developer charges are a complex area full of efficiency, equity and intergenerational issues.

- Investment in water and sewer assets is "lumpy" with large and expensive assets most often designed to cater for current development and future growth.
    - Should current customers and/or developers pay for capacity that will be utilised by future customers?
    - Should future customers and/or developers pay for capacity that has been provided in existing assets (sunk assets)?
- New customers connect to existing assets, they do not connect to future assets.
    - Should new customers and/or developers contribute to assets they will never use (e.g. upstream sewers)?
- Some economic regulators believe that it is inefficient to include a contribution to existing assets with spare capacity (sunk assets).
    - Use of existing capacity is efficient and should be encouraged.
    - Who should pay for this spare capacity?
- Developers are concerned with equity and price advantages a competitor may receive.
    - The Essential Services Commission's current interpretation of determinations is that a development that subdivides will pay one developer charge per service per lot, whereas

- Where a development occurs non-incrementally, the developer is required to pay the cost of bringing forward the construction of the assets required to service the development. However, often the assets will service surrounding land and development can occur without the need for further expansion of the network. This gives rise to subsequent developers receiving a "free ride".

The Productivity Commission is seeking further information on developer charges.

1. How are developer charges levied in each jurisdiction, for both greenfield and urban infill developments?

Prior to regulation by the Essential Services Commission (ESC), Victorian water companies set developer charges that met or contributed to the present day cost of any works that are used or will be able to be used directly or indirectly for the provision of services to a property and the charges were "fair and reasonable" as required under Section 29 of the *Water Industry Act 1994*.

The Melbourne water companies used a methodology that was principally based on guidelines set by the Independent Pricing and Regulatory Tribunal of New South Wales (IPART).

The methodology used by Yarra Valley Water was to split the company's licensed area into development areas which contained "like" and adjacent water supply zones or sewer catchments. For each of the areas developer charges were set using a 25-year net present value model with inputs being past and future infrastructure investment both in the zone and downstream where the assets had capacity available for growth, expected revenue and operating costs and forecast growth rates. The balancing item was the developer charge which was set to achieve net present value (NPV) = 0 at a given discount rate.

The developer charges served two related functions:

- provided a source of funding for infrastructure, both past and future, required for development; and
- provided signals regarding the cost of urban development.

In 2004, the ESC argued that including past infrastructure investments (sunk costs) did not provide appropriate locational signals and may result in inefficient investment decisions. The methodology they proposed was a model with the only input being future capital investment. It could be argued that the setting of developer charges in this manner resulted in an under recovery as new customers and developers only contributed to new assets and did not contribute to the capacity provided in existing assets for growth.

The water companies submitted development area developer charges and in the 2005 Determinations, the ESC approved scheduled developer charges where they were less than $500 per lot per service and capped the charges at $500 per lot per service where they were more than $500.

Thus the developer charges:

- provided a contribution to the cost of funding future infrastructure required for development,
- provided signals as to where it was efficient to develop, where charges were less than $500 per service per lot, but did not provide strong signals as to where it was expensive to develop, and

- did not provide contributions for investments made in advance of development occurring (sunk costs).

The 2005 determination did attempt to provide developers with a cost signal for non-incremental development. Where development occurs non-incrementally with respect to the water company's assets, the water company had an option to calculate and apply a non-scheduled developer charge based on the financing cost of bringing forward capital expenditure by the estimated number of years. For example if a non-incremental development required assets to be constructed three years ahead of when it would be required for incremental development, three years of financing costs would be applied. This was charged in lieu of the scheduled charge.

In the 2008 determination (2009 for the Melbourne water companies) the ESC recognised that not all developments imposed the same load on infrastructure nor did all developments result in the extension of infrastructure. The ESC, after consultation with the water industry, created three classes of development which, for ease of administration, were based on the size of the lot. The scheduled charges, which are adjusted annually by CPI, are:

- Category 1: $550 per lot per service for water, sewerage and dual pipe recycled water (total $1,650 per lot) for developments which are designed in a manner that will have minimal impact on future water resource demands and can be catered for without additional investment to upgrade the medium-term distribution capacity. These developments are typically a lot with an area no greater than 450 square metres.
- Category 2: $1,100 per lot per service for water, sewerage and dual pipe recycled water (total $3,300 per lot) for urban developments which will require further investment in infrastructure. These developments are typically traditional greenfield urban developments with lot sizes between 450 square metres and 1,350 square metres.
- Category 3: $2,200 per lot per service for water, sewerage and dual pipe recycled water (total $6,600 per lot) — for developments designed in such a way that the properties will create demand for water resources over and above high-density developments which will require further investment in infrastructure. These developments are typically greenfield developments with lot sizes exceeding 1,350 square metres, for example, lots with potentially large outside water use which will influence near term investment in infrastructure decisions.

Developments connecting to recycled water are subject to a 50 per cent reduction in the applicable scheduled charge for water.

The scheduled developer charges are levied on a per titled property basis.

Similar to the 2005 determination, where development occurs non-incrementally with respect to the water company's assets, the water company has an option to calculate and apply a non-scheduled developer charge based on the financing cost of bringing forward capital expenditure. This is charged in lieu of the scheduled charge.

However rather than on a year by year basis the ESC has blocks of years. Where an asset would be required for incremental development within five years, a non-scheduled charge cannot be applied. Where an asset would be required for incremental development between 5 and 15 years, a non-scheduled charge equal to 40% of the cost of the asset can be charged. Where an asset would be required for incremental development beyond 15 years, a non-scheduled charge equal to 70% of the cost of the asset can be charged.

Table 1 summarises the changes in developer charges over this period.

Table 1: Yarra Valley Water historical developer charges per lot

	August 2001 to 30 June 2005 (2001 nominal dollars)	2005 Determination (2005/06 dollars)	2009 Determination (2009/10 dollars)
+Water			For all areas based on lot size
Dandenong Ranges	$2,132	$0	< 450 m2 $563.56
Eastern Growth	$1,355	$0	450 – 1350 m2 $1,127.12
Eastern Inner	$409	$0	> 1350 m2 $2,254.25
Eastern Middle	$504	$0	
Eastern Outer	$1,031	$0	When recycled water
Hurstbridge Corridor	$1,219	$0	developer charge applied, the
Merri Growth	$1,822	$500	water charges are halved
Northern Inner	$359	$0	
Northern Outer	$580	$0	
Plenty Growth	$2,052	$500	
Yarra Valley	$1,211	$500	
	Discount for lots less than 800m2		
Sewer			For all areas based on lot size
Brushy Creek	$328	$0	< 450 m2 $563.56
Craigieburn	$3,068	$500	450 – 1350 m2 $1,127.12
Croydon - Ringwood	$1,345	$0	> 1350 m2 $2,254.25
Darebin North	$2,816	$500	
Emerald – Cockatoo	$4,832	$0	
Epping North	$3,794	$500	
Healesville	$3,024	$0	
Kew Catchment	$1,807	$0	
Lilydale	$1,769	$0	
Mernda Doreen	$3,855	$500	
North Yarra	$2,041	$0 and $500	
South East	$1,024	$0	
South Yarra	$2,015	$0	
Upper Yarra	$3,947	$0	
Whittlesea	$5,286	$500	
	Discount for lots less than 700m^2		
Recycled Water			For all areas based on lot size (when supplied with recycled water)
			< 450 m^2 $563.56
			450 – 1350 m^2 $1,127.12
			> 1350 m^2 $2,254.25

2. *Do developer charges currently provide adequate signals on the costs of servicing new developments*

The cost of servicing new developments varies from location to location and with the demand from the development.

The current scheduled developer charges provide a base amount of $550 per service as a contribution to capacity provided in advance of growth (sunk cost) and a contribution of $0, $550 or $1,650 per service towards the cost of investment in future infrastructure.

Thus the developer charges do provide signals that greenfield development generally requires investment in infrastructure and that larger properties have the potential to place higher demands on the infrastructure than smaller properties.

However the charges do not provide signals as to where it is more efficient to develop (i.e. does not distinguish where development would require cheaper/more expensive infrastructure).

The ability to levy non-scheduled charges that are greater than the scheduled charges for non-incremental development does provide developers with a signal that it is inefficient to develop non-incrementally. However, the large increment in charges (0%, 40% and 70%) provides a strong incentive for developers to forecast aggressive development rates and thus move to a lower non-scheduled charge category. This often leads to disputes between the developer and the water company and increases the administration burden.

3. *To what extent should developer charges be set periodically on an 'across utility' basis, or be specific to the development in question*

The frequency of calculating developer charges should be such that administrative efficiency is maximised while taking into consideration that the timing of assets is influenced with actual location and rate of development.

It is likely that the Victorian water industry will be subject to five year regulatory periods. Setting of the charges at the start of and in the middle of the regulatory period may be appropriate timing.

Yarra Valley Water develops servicing strategies for growth areas often ahead of when specific development proposals are lodged. The strategies take into consideration the merits of centralised and decentralised systems for an area.

Setting charges on an "Across utility" is too broad and will not provide appropriate locational signals. "Development specific" is too narrow and would require a specific development proposal to be submitted prior to assessment of charges. This would not provide developers with an indication of charges prior to purchase of land or development. Development specific charges do result in additional administration costs in calculating charges as development arises and should be only used when a particular development is non-incremental.

It is Yarra Valley Water's belief that scheduled charges should be set on a development area basis with each area containing "like" and adjacent water supply zones or sewer catchments. This would ensure that all incremental development within an area will contribute an equal amount to the cost of providing facilities to the area.

The option for non-scheduled charges for non-incremental development should be retained to provide locational signals but rather than using blocks of years, should revert to the methodology in the 2004 ESC determination using a year by year basis.

4. Would more development specific charges, especially in high cost areas, encourage greater innovation?

Yarra Valley Water's servicing strategies for growth areas take into consideration the merits of centralised and decentralised systems for an area. Development specific servicing solutions, and thus development specific developer charges, could lead to a less than optimal overall servicing of an area (i.e. assets sized for one development requiring duplication for future developments).

Yarra Valley Water encourages innovation and is always willing to work with developers to provide servicing solutions at the least community cost.

5. Would it be better for developers to build the required infrastructure according to standards set by the utility? If so, what issues would need to be addressed to operationalise this?

Yarra Valley Water currently permits developers to design and construct infrastructure to our standards particularly where the infrastructure is located within the development. This allows the developer to better co-ordinate all of the works within the development.

We do, however, reserve the right to manage the design and construction of major infrastructure such as sewage treatment plants, large pumping stations and pipelines through difficult or environmentally sensitive areas.

In the past, Yarra Valley Water has permitted the developers of Body Corporate (now Owners Corporation) developments to decide what standards the assets within their development were constructed to:

- If constructed to Yarra Valley Water standards the assets were gifted to us and we provide the ongoing operation and maintenance
- If constructed to a lesser plumbing standard, the Body Corporate retained ownership of the assets and were responsible for the ongoing operation and maintenance.

Where the assets were constructed to a plumbing standard, we are now facing issues with subsequent owners of the development being unaware of their responsibilities to repair bursts and leaks.

We now require that any development of 20 or more lots is built to Water Services Association of Australia standards.

6. What are the main impediments to introducing more efficient developer charges?

The main impediments are:

- Participants in developing the charges may let self interests over ride the "right answer".
    - Water companies may argue for high charges that provide a relatively stable income stream and reduces the quantum of price increases to its general customer base.
    - Developers with land holdings in areas that are expensive to service may argue for charges to be averaged across the water company's area.
- Efficiency versus equity arguments over who should contribute to assets where assets are provided with spare capacity for future development
    - Efficiency would be that the first developer requiring the asset should contribute to the asset and future developers should not contribute to encourage development where there is spare capacity. The first developer would be at a financial disadvantage having contributed to the asset compared to other developers who receive a "free ride".

- Equity would be that all developers contribute an amount that represents their share of the capacity of all of the assets required to service an area. Once assets are in place, this would not provide the financial incentive for developers to develop in a serviced area rather than an unserviced area.
- Equity would also be that existing customers do not pay for growth. Revenue from new customers, either directly or via developer charges, pays for the cost of growth and their use of the existing network.

APPENDIX 6

Case Studies on our Community Cost Framework

Case studies:

1. Life Cycle Assessment Overview
2. Application of our Community Costing Framework at Doncaster Hill
3. Blackburn Alternative Servicing Strategy

CASE STUDY 1: Life Cycle Assessment (LCA) - Overview

LCA looks at the environmental impacts of a product or service throughout its entire life cycle. The traditional definition of LCA is *"a cradle-to-grave environmental assessment that accounts for all resource use and releases related to the system being studied, and translates this information to the possible harm (or benefit) to the environment and human health."* (Curran, 1999).

Using LCA has been extremely valuable as it has enabled us to move away from subjective views to making decisions based on a scientific comparison of the environmental impacts associated with a range of options.

We use LCA to assess major projects to ensure we are selecting the option which has the lowest environmental impact. For example, we used it to determine whether we should choose pressure sewers over gravity sewers, what water meters we should use, and have completed infrastructure servicing option studies based on LCA at many new development sites.

After using LCA, we began to see strong trends emerging. In particular, we learned that for all the environmental impacts, water, nutrients, and greenhouse gas emissions were predominant. We also learned that the environmental burden of operating water infrastructure far outweighed the embedded impacts of building new infrastructure.

For all of its benefits, however, LCA does require considerable resources and time to use. So after a number of years, and having a number of projects behind us, we started to simplify our environmental assessment. We moved from undertaking a complete LCA for each project to just looking at the predominant impacts which were driving the outcomes. As stated above, these are nutrient discharges, potable water used and greenhouse gas emissions.

References

Curran, M.A. 1999, *The Status of LCA in the USA*, International Journal of LCA, 4 (3) p. 123-124

CASE STUDY 2: Application of Our Community Costing Framework at Doncaster Hill

Introduction

The Doncaster Hill development provided an opportunity for Yarra Valley Water to work with Manningham City Council and Melbourne Water to provide innovative water services to a brownfield re-development (or urban consolidation) at least cost to the community taking into account impacts on the environment.

Objectives

There are two objectives in Yarra Valley Water's corporate strategy that drive our approach when we assess the options for servicing developments:

1. that we achieve our objectives at the lowest cost to the community, and
2. that we provide our services within the carrying capacity of nature.

These two objectives are addressed in our community costing framework which is used to assess all new servicing options. In this way, Yarra Valley Water's framework takes a broad view of community costs and benefits to select the best overall project option. Where possible, it is important to 'calculate' the best overall project by assigning dollar amounts to the full range of benefits valued by stakeholders. This includes monetising the key externalities of greenhouse gas emissions, nitrogen discharge to Port Phillip Bay and the next major augmentation of Melbourne's water supply system. Where it is not possible to place a reasonable dollar value on benefits, a qualitative comparison is made between options. Importantly, Yarra Valley Water's approach engages the community in assessing the options. This provides a greater degree of transparency and robustness to the assessment.

Doncaster Hill Development Case Study

The Doncaster Hill development is an example where Yarra Valley Water has used its community costing framework to take a broader external perspective by considering the total cost on the community. The development consists of approximately 58 hectares of existing commercial and residential land centred on the intersection of Doncaster Road and Williamsons/Tram Road in Doncaster, a suburb of Melbourne. The area will be redeveloped to be a mixed-use sustainable urban village with a community-focused lifestyle featuring 4,000 new medium to high density apartments within walking distance to shops, restaurants and workplaces, parkland, entertainment and public transport together with approximately 90,000m2 of retail and commercial floor space.

The conventional approach for the supply of services to a brownfield re-development is to connect to existing water and sewer mains. Indeed, our early investigation found that there is enough capacity in the existing local water and sewerage infrastructure to support increased demand without the need for augmentation of the distribution network. However, one of the key insights we have formed in developing previous Integrated Water Management (IWM) servicing solutions is that the location of the area to be serviced will heavily influence the viability of an alternative approach to conventional servicing (such as proximity to sunk infrastructure with spare capacity, distance from catchments, elevation etc). The Doncaster Hill project arose when the stakeholders recognised that the cluster of planned developments provided an opportunity to apply an integrated urban water management strategy for the area. Their initial assessment suggested it could deliver a more environmentally sustainable urban water infrastructure solution than conventional servicing arrangements.

The three key organisations (Yarra Valley Water, Manningham City Council and Melbourne Water) agreed to work together. A partnership was enacted through a Memorandum of Understanding which

defined the key objectives of the partnership and the principles that would drive its decision-making. These included maximising environmental outcomes, responsible economic planning, meeting social obligations, supporting innovation and providing leadership.

The partnership considered that existing assessment methodologies had their limitations when applied to a wide-ranging proposal consisting of multiple options. Therefore, a number of different methodologies were combined and used in the assessment of the options. These included:

- Life Cycle Assessment (LCA) to identify and compare all environmental impacts from construction and operation activities
- Probabilistic methodology to identify areas of uncertainty related to the consequences and the likelihood of effects on affected parties
- Use of Multi Criteria Assessment (MCA) to assess the economic, environmental and social costs and benefits of elements that cannot be quantified
- Triple Bottom Line (TBL) to assess the financial, environmental and social impacts.

Methodology/ Process

We have found that a clear process, although invisible when everything goes well, can be as important as the costing framework itself. Our process continually evolves but the steps we undertake currently to assess a project are set out below.

Step 1: Define the project aims and needs

Our first step is to define the aims and needs of the project. These must be clear and measurable to achieve optimal outcomes. Yarra Valley Water's aims are to provide solutions that have the lowest overall impact on the environment at the lowest community cost. The starting point is conventional water services against which all alternatives are compared.

A stakeholder workshop was held to agree on the project objective and develop a set of end parameters for each option under consideration. The parameters included infrastructure costs, greenhouse gas emissions, export of stormwater pollution, stream health, deferral of infrastructure expenditure, local amenity, volume of potable water imported and wastewater exported.

Step 2: Identify feasible options

This step involves identifying a set of practicable options to meet the stated objectives of the project. Research and stakeholder consultation are important inputs to this step of the process, particularly where there may be significant external factors and outcomes. An expert panel was formed to develop servicing options for Doncaster Hill. The panel comprised members with knowledge in stream ecology, decentralised systems, community cost/benefits, delivering alternative services, public health, and social benefits. Of the options presented, eight were selected for further analysis as they were considered to potentially meet all of the desired project outcomes.

The result was a spectrum of options covering all possible combinations, whether feasible or not. The identified options were screened to remove options that were clearly financially or technically infeasible. This is a delicate process because, if done poorly, it may eliminate innovative options and/or alienate panel members and stakeholders.

Step 3: Identify potential effects of each option

Each option had varying attributes, positive and negative. To compare each option, the most important attributes first need to be determined. Due to the inherent variability across projects and regions, each project will have a different list of important economic, social and environmental attributes.

Ideally, descriptive parameters that are measurable and linked to the project objectives and principles are developed to provide common criteria against which to measure each option. These parameters often include financial cost and benefit, greenhouse gas emissions, export of pollution such as nitrogen phosphorus and suspended solids, stream health, volume of water imported, volume of sewage exported, deferral of expenditure, local amenity and stakeholder buy in.

Step 4: Measure the effects

We quantified as many parameters as possible and used various models to estimate the effects of the options on:

- imported water within the development over representative climatic sequences,
- volumetric and pollutant loads associated with stormwater discharges, and
- all environmental impacts from construction and operational activities.

Where parameters were identified that could not be quantified, a qualitative assessment was used. This used relative measures to compare an option against a base case to determine if the option is better or worse and to what degree. A -3 to +3 scale was used to capture the relative differences.

Step 5: Rate the significance of the effects

Once the effects relevant to the project are determined and estimated, it is necessary to work out their significance or relative importance. We typically use either:

- *Probabilistic assessment* – Areas of uncertainty regarding risk, consequences, likelihood of effects and affected parties are identified. These areas are then rated by their level of significance (high, medium or low) taking into account factors such as reversibility, timing, duration, significance and likelihood of effects, or
- *Multi-criteria assessment* – An approach used where there are many stakeholders. Representatives from each stakeholder group review the parameters identified in Step 2 and determine the relative weighting of each. This can be as simple as a pair by pair comparison.

Once the relative weighting has been completed it is possible to assess alternative options against the initial project needs and objectives identified in Step 1.

Step 6: Undertake Community Cost Assessment

A cost assessment of options was undertaken to determine the impact of each option for the project on all stakeholders. Our approach is, for each option and for all stakeholders, to estimate the marginal change in operating, capital and external costs/benefits that would occur if the option for the project is implemented. For each stakeholder, a Net Present Value calculation over a period of 25 years is prepared to enable a cost comparison based on today's values of future costs and benefits. The total community cost is then the Net Present Value of the direct financial costs and revenues including the monetised value of externalities which are represented in the NPV model as a benefit because they represent costs avoided by the broader community.

Eight options were assessed initially and three were selected for further analysis – conventional servicing, rainwater tanks at each building and third pipe recycled water. These were assessed using Yarra Valley Water's Total Community Cost Model to determine the option that would deliver the best community outcome for the project. This approach has three stages:

- *Community Cost Assessment:* An assessment is undertaken to determine the impact of the project on all stakeholders. For each option, we estimate the direct financial costs and externalities for each stakeholder. The total community cost is the sum of these direct financial costs and externalities for each stakeholder.
- *Stakeholder Costs and Benefits Assessment:* An economic evaluation to assess whether the options have an unfair impact on individual stakeholders. It may be necessary to transfer some of the benefits of a project from one group of stakeholders to another.

Step 7: Undertake Yarra Valley Water Financial Evaluation

This evaluation examines the financial impacts on Yarra Valley Water and the possible flow on effects to Yarra Valley Water's customer prices. This evaluation provides the decision makers within Yarra Valley Water with an informed view.

The Essential Services Commission regulates Yarra Valley Water and other Victorian water utility prices. A key issue is that under current regulatory arrangements, the Essential Services Commission is unlikely to allow Yarra Valley Water to pass on any additional costs to its customers that it might incur in providing innovative infrastructure, even when the additional costs deliver a lower total cost for the community. The Essential Services Commission is only charged with overseeing the water utility's costs and has no jurisdiction over externalities. This is a major barrier to water utilities adopting a Total Community Cost approach and alternative servicing options.

Step 8: Undertake a Stakeholder Costs and Benefits Assessment

An economic evaluation of the impact on each stakeholder is undertaken to assess whether the preferred option has an unfair impact on individual stakeholders. The undertaking of the stakeholder assessment enables consideration of whether, once a preferred option is selected, a transfer of benefits and/or costs should occur.

Where there are significant benefits transferred to the wider community, consideration of an application for partial government funding would be considered.

Results/ Outcomes

The analysis resulted in an option being adopted whereby the development would be provided with recycled water via a new third pipe network. A local treatment plant will produce recycled water from a combined sewer mining and stormwater harvesting scheme.

Environment

Compared to a conventional servicing strategy, the alternative options both provide a similar level of improved outcomes:

Figure 1: Environmental outcomes

	Conventional	Rainwater Tanks	Third Pipe Only
Potable water saved (ML/year)	-	176	176
Nitrogen to the Bay (kg/year)	4,825	3,358	3,211
Electricity consumed (MWh/year)	1,380	1,231	1,267
GHG emissions (tonnes CO_2e)	1,808	1,612	1,660

Compared to a conventional servicing strategy, this development will see potable water consumption reduced by 64%, a reduction in wastewater exports by 53% and a reduction in stormwater exports by 42%.

Financial Outcomes

All options were assessed using a 25-year Net Present Value (NPV) model. The model was run twice; once with Yarra Valley Water's costs and benefits (only including revenues from additional customers) and, secondly, to include the whole of community costs such as greenhouse gas (GHG) abatement, nitrogen offsets and deferment of future headworks augmentations. Two development scenarios were also modelled to test sensitivity of the model.

The modelling indicates that both of the alternative options, although offering reasonable returns, would be less attractive to Yarra Valley Water than the conventional option. They are preferred, however, when the whole of community costs are taken into account. The crucial difference is the significant cost associated with nitrogen offsets and the cost of future augmentations to both water supply and sewerage infrastructure. The value of reduced nitrogen discharges was set at $2,200/kg and this was offset by the cost of construction of downstream stormwater treatment facilities or wetlands[41]. Long-run marginal cost was used as a proxy for the cost of future water supply and sewerage augmentations (it was assumed that additional desalination would be the next augmentation).

Conclusion

The Doncaster Hill servicing process has shown that by working co-operatively with other stakeholders who have a shared vision, our community costing framework can produce a servicing strategy that will result in a more sustainable development with less environmental impact achieved at a lower overall community cost. It also allows scope for innovation. A third pipe solution providing recycled water sourced from treated sewage was found to have the lowest community cost. While third pipe use is not uncommon, this will be the first time this has been utilised in Australia for a brownfield re-development, including multi-storey buildings. The table below (Figure 2) clearly shows that the NPV of the project to Yarra Valley Water is $5 million less ($30.2 million compared to $25.2 million) but this option presents the best value to the community ($7.9 million compared to $5.2 million). It is also worth noting that,

[41] RossRakesh, Sharyn, Francey, Matt and Chesterfield, Chris, 2006, *Melbourne Water's Stormwater Quality Offsets*, Specialist Forum: Emerging issues and directions in WSUD, v2, pp 207-216.

under the high growth scenario, the community benefits are substantially more than the conventional solution ($16.9 million compared to $6.4 million).

Figure 2: Financial outcomes

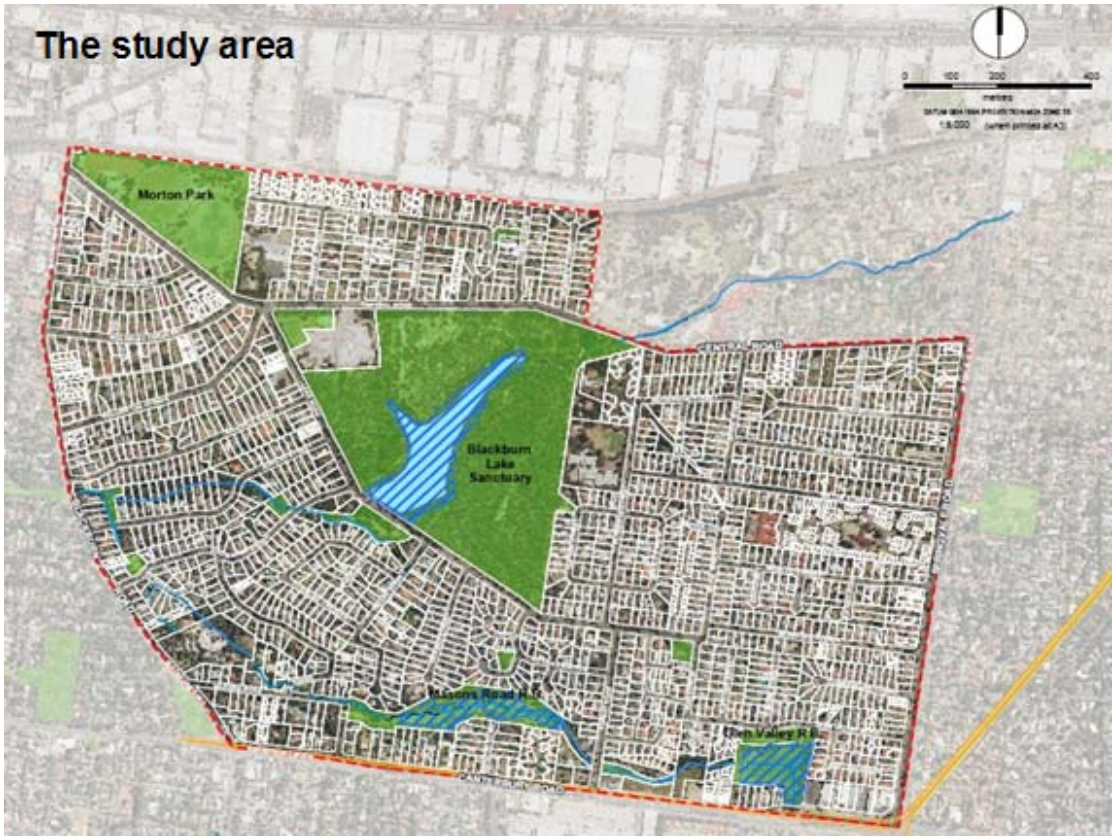
	Net Present Value ($ million)					
Option	Conventional		Rainwater tanks		Third pipe only	
Development scenario*	Low	High	Low	High	Low	High
YVW only NPV	30.2	50.0	24.9	43.0	25.2	44.7
Additional community costs						
Nitrogen cost	-7.5	-13.1	-5.3	-8.5	-5.1	-8.1
GHG abatement cost	-0.5	-0.8	-0.5	-0.8	-0.5	-0.8
Future supply resource augmentation cost	-17.0	-29.7	-12.1	-19.6	-11.7	-18.9
Whole of community NPV	5.2	6.4	7.0	14.1	7.9	16.9

* Low growth = 2,670 residential dwellings, High growth = 4,000 residential dwellings + 50ML/year irrigation

CASE STUDY 3: Blackburn Alternative Servicing Study

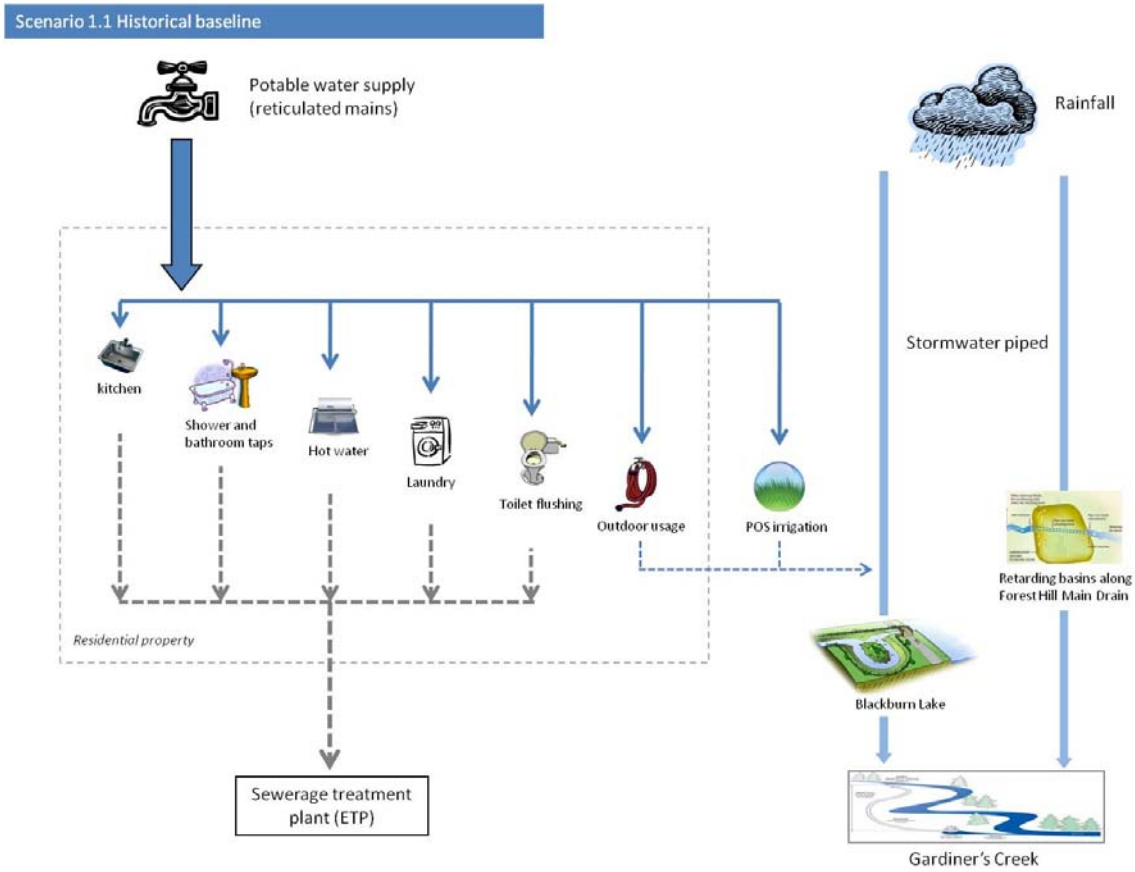
Introduction

The study was undertaken to look at providing alternative water and sewerage services in an existing developed area. A study area was selected that had all of the prerequisites that could, theoretically, offer us the greatest chance of success, on the basis that if alternative servicing could not be made to be viable where everything was in our favour it would be unlikely to be viable on a broader basis. The prerequisites were the availability of an existing stormwater storage site, high percentage of reticulated water and sewers close to the end of their asset life, access to a large sewer to mine, and an existing water and sewerage system requiring a large amount of energy. The Blackburn region was selected. The study area consists of 2,200 residential properties.



Alternative servicing options

A range of alternative water sources were considered, including rainwater (roof runoff), stormwater (catchment runoff), and treated wastewater (sourced from greywater or sewer mining). There was also an opportunity to divert additional stormwater from the adjacent Forest Hill Main Drain into the Blackburn Lake at the location.



Eleven alternative infrastructure options were developed to concept design and tested against the existing base case. These included:

- Centralised improvement options using demand management strategies and/or the use of a buffer tank to manage peak demands
- Decentralised in-house options for the harvesting of roof runoff and/or reuse of greywater
- Precinct and/or catchment infrastructure options that involve sewer mining and/or stormwater harvesting options treated to non-potable and potable standards

A multi-criteria analysis, Net Present Value (NPV) and economic analysis were undertaken to compare and prioritise the most promising solutions.

Results

Key points from the study were:

- Having access to an existing storage reservoir and sewer for sewer mining is considered the most important contributing variable to making alternative options viable.
- Renewing existing water pipes and sewers with different sizes was limited and consequently did not deliver significant cost reductions.
- It is possible to provide a number of alternative urban water infrastructure solutions to an existing urban development that are significantly more environmentally sustainable than traditional servicing.
- Four options were identified:

- Stormwater harvesting to supply potable demand
- Stormwater harvesting to supply non-potable demand
- Sewer mining to supply non-potable demand
- Stormwater harvesting to supply potable demand and sewer mining to supply non-potable demand

- It is possible to achieve mains water use reductions above 90% (Figure 1), greenhouse gas emission reductions above 60% (Figure 2) and nitrogen load reductions discharged into the local waterway in the order of 60% (Figure 3).

Figure 1: Reduction in mains water use, wastewater generation and stormwater discharges to receiving waters associated with each option

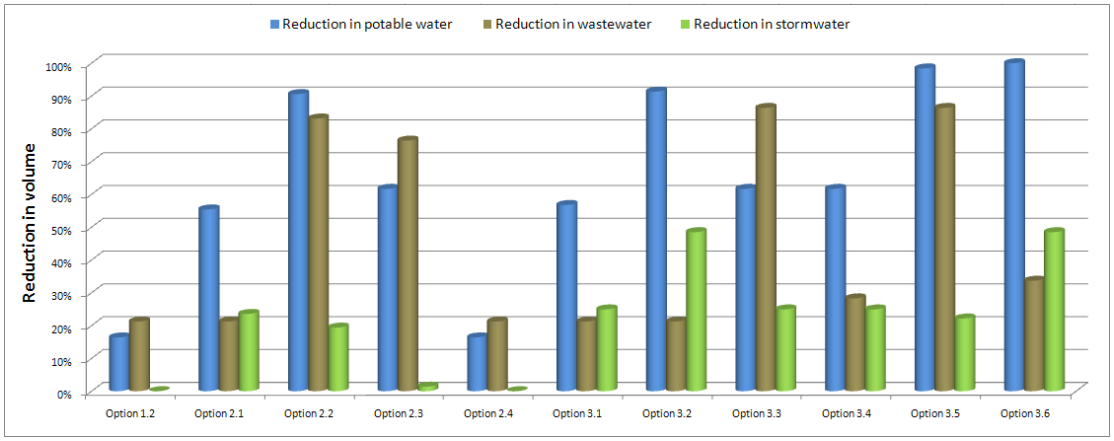


Figure 2: Future greenhouse gas emissions associated with each infrastructure portfolio option

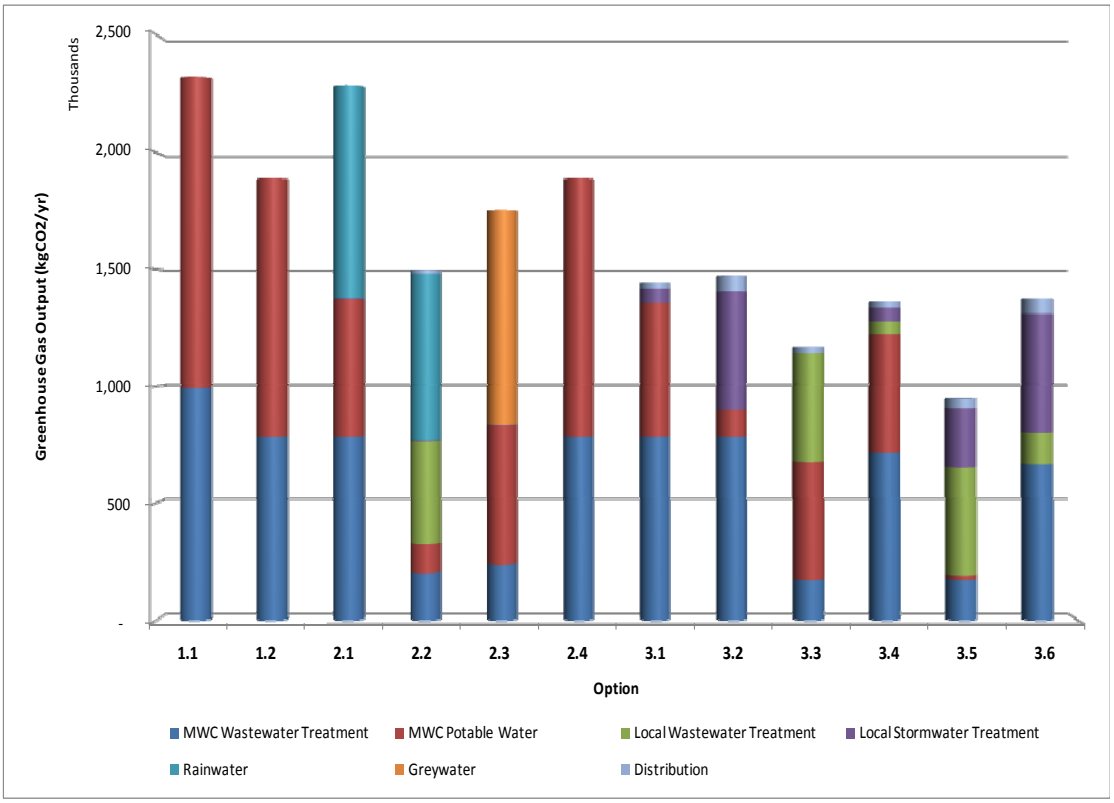
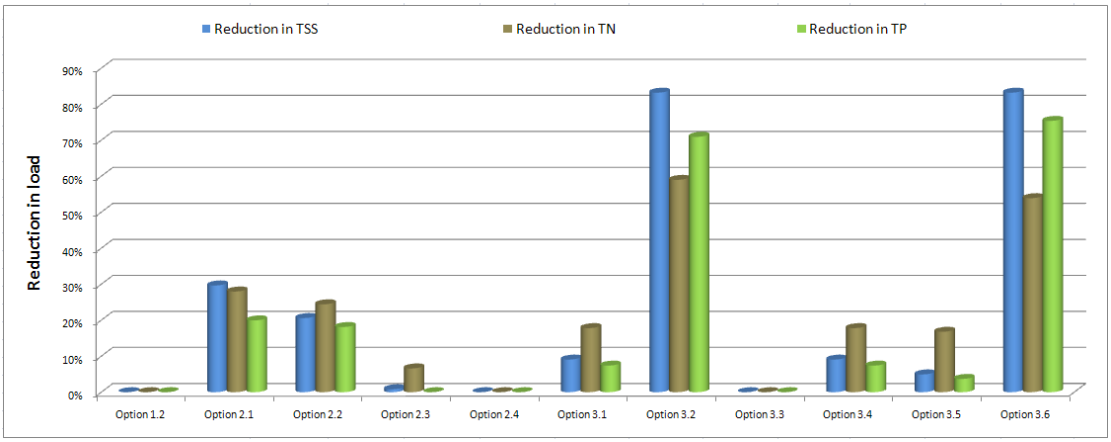
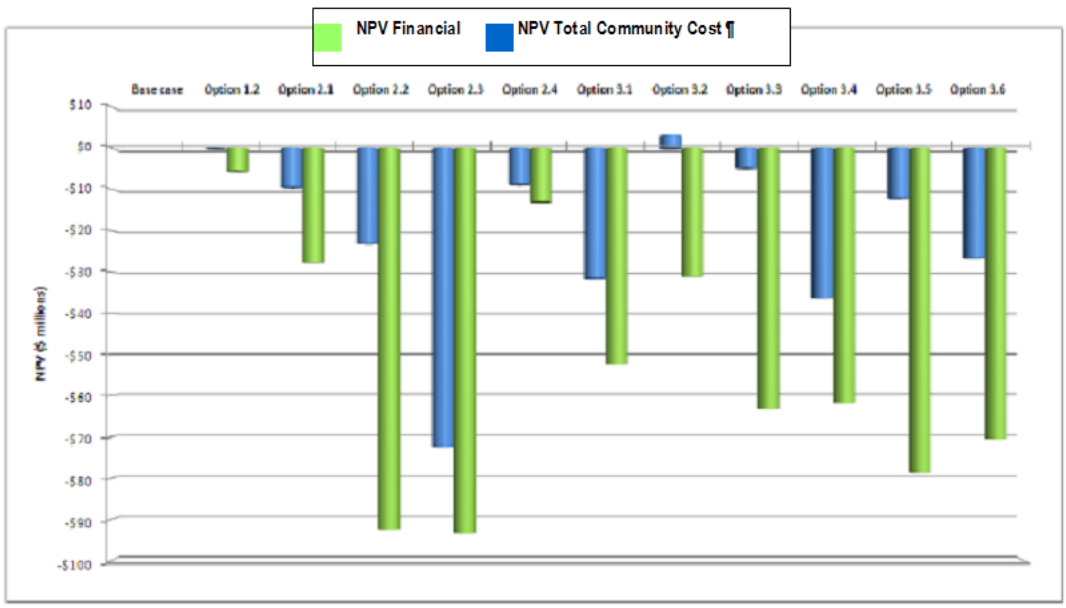


Figure 3: Reductions in tss, tp and tn loads conveyed to receiving waterways associated with each infrastructure portfolio option



- All options would need additional assets to be constructed and this would require additional costs. It is only when externalities are included that the NPV of options approaches being neutral. The potential to defer future potable water augmentation is by far the largest externality, with the reduction of nitrogen, being the next largest. The economics for augmentation deferral is heavily dependent on the assumption made as to whether the next augmentation will be desalination, at a relatively high cost or via other lower cost bulk water sources. Our model was based on the desalination option.
- Only one option was found to be NPV positive when the externalities were considered (Stormwater harvesting for potable supply – Figure 4)

Figure 4: Cost analysis



- A big contributing factor to making the remaining options NPV negative is the cost of adding a third pipe to an existing house. It is estimated that this would cost at least $10,000 per property. For the sewer mining option, for example, to return a NPV neutral result would require this plumbing to be installed at $8,800. Given that installing internal plumbing into a new house is in the order of $2,000, this work identifies another 'potential lever' that could be used to create a viable NPV option. An option could be to require all re-builds in a certain area to be third pipe ready.
- Another potential variable identified that could make a few more options NPV positive, is to service a larger area than just the Blackburn region with the same treatment plant (at the same time finding suitable locations accepted by the community to build treatment plants within developed areas could be problematic). For example, the sewer mining option can service an additional 2,360 allotments (the Blackburn study area has only 2,177 residential properties).
- The avoided cost in downsizing infrastructure was considered negligible. By comparison a more material benefit could be achieved through pressure reduction that would defer the need to renew water infrastructure.
- Nitrogen can be removed from wastewater far more cost effectively than it can be from stormwater, however there are technical limits to the amount that can be removed from both sources

Conclusion

While we have proven that it is theoretically possible to service an existing development in a more sustainable way, the potential of utilising such infrastructure options across Melbourne is limited to similar sites that already have an existing stormwater storage / lake. A 'back of the envelope' calculation indicates that the potential yield from suburbs with similar prerequisites would only contribute to about 1% of Melbourne's bulk water supply.

APPENDIX 7

A real options framework for water security

Melbourne's water supply situation is better now than it has been for a long time:

- We have experienced good rains
- The community is saving water
- The desalination plant will be commissioned in the next year
- A number of recycling projects have been implemented and more are underway
- Interconnections of water supply provide back up security should water storages fall to low levels.

Looking ahead, a roadmap for the future has been articulated by the Ministerial Advisory Council in its Living Melbourne, Living Victoria Plan for water. Key elements of the plan include a range of actions to support a more sustainable, productive and liveable Melbourne. This includes:

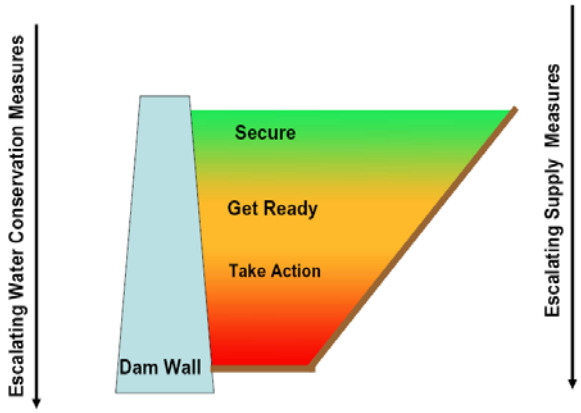
- Water security for the future
- Embedding water efficiency within the community
- Affordable water services
- A smaller environmental footprint for Melbourne
- A more liveable Melbourne, comprising,
    - Attractive landscapes that support healthy communities
    - Safe, fit for purpose water supplies
    - Improved flood protection

The plan recognises water restrictions helped the community through the recent drought, but they also compromised parks, gardens and sporting fields.

Furthermore, the plan notes that a resilient, adaptable and flexible water system is a prerequisite for a liveable city.

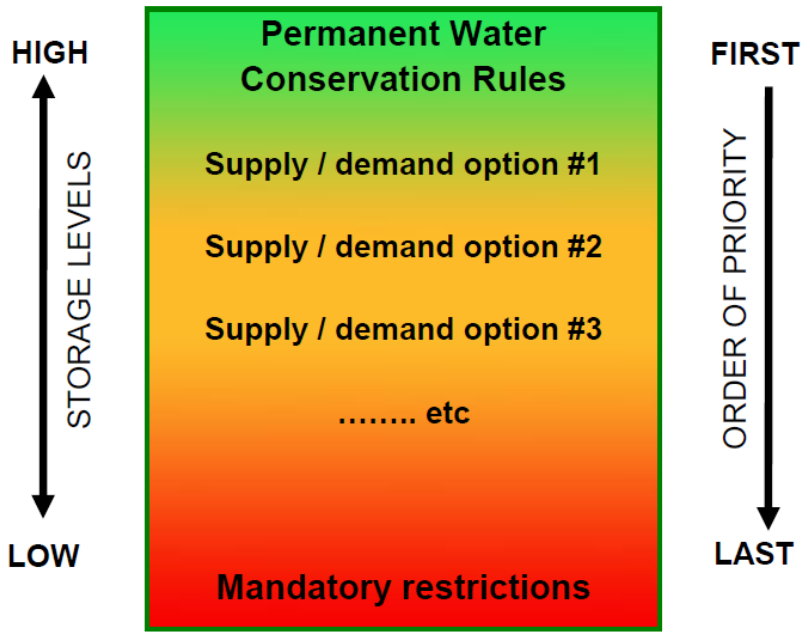
To achieve the above outcomes, a conceptual framework is emerging to manage water security that considers options relating to new water supplies as well as options that save water.

This is illustrated in the following diagram that shows as levels in dams fall, escalating demand management and new supply options would be introduced:



The intention would be to have both short and long term options pre-planned and ready to go should the situation change quickly. Under such an arrangement, supply and demand options would be implemented in sequence according to their assessment against key criteria including community benefit/cost, community acceptance and the degree to which the option can contribute to rebalancing supply and demand in the required time frame. Mandatory water restrictions could be seen as a last resort (due to the relatively high community cost) and as such a combination of other supply and demand options would be proposed to minimise the use of water restrictions.

Between the norm of permanent water conservation rules and the extreme of mandatory restrictions, the various supply and demand options are ranked in order of implementation priority against storage levels as shown in the diagram below. Some examples in increasing order of severity are: ongoing water efficiency education, incentive programs, increased recycling, and larger augmentations.



On an annual basis following the spring dam filling season, an assessment of the water supply situation could be undertaken, with a public report showing current status and actions being taken, including canvassing views on potential actions.

APPENDIX 8

Characteristics of a Water Grid Manager body

Establishment of a Water Grid Manager needs to be accompanied by reform of the Melbourne retailers' 'pooled' bulk entitlements – giving them individual responsibility for ensuring security of supply in their geographic region through balancing their supply-demand requirements and so providing them with greater incentives to pursue more efficient and sustainable demand management and decentralised water solutions. We see a dynamic environment where the Water Grid Manager aggregates the water supply demand balances of each water utility on an annual basis to ensure the security of supply objective across the grid is continually achievable.

The implementation of a State third party access regime will enable new entrants to use the water grid infrastructure to deliver water. This development exposes the existing collaborative water grid management arrangement through the Bulk Entitlement Management Committee (BEMC) to commercial realities. The current BEMC participants would be exposed to the allegation of collusion if a new entrant was excluded or limited in its use of the network, irrespective of the reason, and commercial remedies could be sought in the event of an adverse outcome for the entrant.

Based on a number of case studies, we believe the Water Grid Manager should:

- be an entity that does not own assets or tradeable water entitlements and which must operate on a not for profit basis
- be subject to appropriate governance arrangements with an Independent Board accountable to the Minister for Water and held to account for the achievement of the objectives
- focus on strategic decisions involving long-term security of supply of the grid (taking account of the requirements of the retailers) rather than being responsible for day to day operational decisions. These strategic decisions would include:
    - directing (but not operating) transfer of bulk water within the grid
    - transitioning the entry of new water sources
    - facilitating the transfer of water by substitution though the network, e.g. enabling desalinated water to be traded to other urban water utilities
    - balancing security of supply and beneficial environmental outcomes (e.g. through water transfer between storages)
- monitor, collect and publish information on the overall security of supply and environmental outcomes for the grid
- be responsible for consolidating a five-yearly water supply demand strategy for the grid
- facilitate efficient investment decisions in the grid but not make the investment decisions – this could be achieved through publishing an annual statement of opportunities
- take a lead role in water accounting associated with water trading
- establish and oversee emergency management arrangements across the grid participants where multiple grid participants are impacted

- hold Melbourne's 'source' bulk entitlement and adopt a role similar to Goulburn Murray Water for Northern Victoria
- possibly lead the implementation of upstream competitive arrangements involving separate bulk entitlements for Melbourne's retail water utilities
- seek opportunities to optimise overall water use outcomes by:
    - accounting for costs, including environmental costs and benefits, of extracting water at source
    - pursuing lowest economic cost objectives in balancing the demands of consumptive and environmental water users.

Melbourne's water supply network transports potable water to Melburnians. Water quality for customers is an important issue, in terms of safety standards and aesthetic impacts on customers. The lesson from the gas industry is that clear accountabilities and mechanisms to control aesthetic quality (e.g. colour, taste and odour) should be established for water supply network participants. A retailer could potentially bring lower quality water into the supply system for cost or security of supply reasons. While such water would meet all health and safety standards under the *Safe Drinking Water Act 2003*, it may impact on the aesthetic quality of supply for other retailers through commingling. It may also have consequences for network owner-operators if the lower quality water impacts on their assets. An independent Water Grid Manager could act as the arbiter for aesthetic quality standards and agreements to ensure that quality standards are maintained for the benefit of all users, or to take action if there is non-compliance. Melbourne Water would continue to be responsible for day to day water quality obligations at interface points with the retailers in accordance with the Bulk Water Supply Agreements.

This Water Grid Manager should be capable of overseeing transport of wastewater to regional sewage treatment plans. For example, in Melbourne there is capability to switch flows in the sewage transfer between the Western Sewage Treatment Plant and Eastern Sewage Treatment Plant at the Kew Pumping Station and at Gardiners Creek.

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