Investigation into Water and Wastewater Service Provision in the Greater Sydney Region

Final Report

IPART

INDEPENDENT PRICING AND REGULATORY TRIBUNAL
of New South Wales

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1 INTRODUCTION AND OVERVIEW

In December 2004, the NSW Government asked the Independent Pricing and Regulatory Tribunal of New South Wales (the Tribunal) to review and provide advice on pricing principles and alternative arrangements for the delivery of water and wastewater services in the greater Sydney region, including possible private sector involvement. It also asked the Tribunal to make recommendations for providing these services in the most efficient, effective and sustainable way. (See Appendix A for the full terms of reference.)

On 2 September 2005, the Tribunal released a Draft Report for this review. The Draft Report presented and discussed the Tribunal's findings and preliminary conclusions, and provided an opportunity for interested parties to comment on these findings and the Tribunal's draft recommendations to Government. Having considered submissions received on the Draft Report[1] the Tribunal has prepared this Final Report, which contains the Tribunal's final recommendations to Government.

The Tribunal's recommendations involve the introduction of competitive reform to Sydney's water industry. However, the Tribunal has not sought to define a specific end-point for the industry. Instead, this Final Report provides a platform for enabling the reform process, and sets out what is needed for the next stage of reform implementation.

1.1 The impetus for reform

Water is an essential service. Its supply has become a major issue for the greater Sydney area. During the last two decades, the demand for water in the region has regularly exceeded the current estimate of the long-term sustainable supply from existing infrastructure (the 'sustainable yield'). Ongoing severe drought conditions in recent years have significantly lowered the levels of water supply storages throughout the area. Taken together, these factors highlight the urgent need to address the issue of sustainable water supply and demand.

The Government's Metropolitan Water Plan sets out actions required over the next 25 years to ensure sustainable water supplies for Sydney.[2] A key component of the plan is encouraging the involvement of the private sector in developing innovative methods of service provision, particularly the provision of recycled water services. The Metropolitan Water Plan has implications for the pricing of water and wastewater services and for the structure of the water and wastewater industry in Sydney in general. Combined with other factors (such as Services Sydney's proposal to enter the wastewater service market)[3] – these implications have created an impetus to examine the merits of industry reform.

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1 Submissions to this review are available on the Tribunal website: www.ipart.nsw.gov.au

2 NSW Government, *Meeting the challenges: Securing Sydney's water future, The Metropolitan Water Plan*, October 2004. The Plan aims to address the balance between water supply and demand through a variety of actions, such as enhancing demand management programs, increasing the emphasis on water recycling, and securing additional water supplies.

3 Services Sydney, a private sector firm, approached Sydney Water with a proposal to enter the wastewater service market. When the proposal was not successful, it pursued the matter with the National Competition Council (NCC) and, more recently, the Australian Competition Tribunal. Under Services Sydney's proposal, it "would compete for retail customers in the provision of sewerage collection services, obtain sewerage transportation and interconnection services from Sydney Water, and then provide its own sewage treatment services and as a second element, supply bulk water for various purposes" (Services

In general, experience suggests that, where it is feasible, competition encourages efficiency and innovation, and is preferable to regulation. However, the introduction of competitive market reforms in the water industry has lagged behind other utility sectors (such as energy), both in Australia and overseas. This means there is limited experience of competition in water services and hence, limited evidence to draw upon. Thus, the debate in water is still about the *potential* efficiency gains achievable from reform.

1.2 The Sydney context

Responsibility for the supply of potable water in the greater Sydney region is divided between Sydney Water and the Catchment Authority. The Catchment Authority was established in 1998 to manage water catchments to ensure water quality, and to supply bulk water to Sydney Water from a system of dams and other infrastructure. Sydney Water's role is to filter and deliver potable water to end-customers, and to transport and treat wastewater.

The obligations of these agencies are set out in legislation, Operating Licences and Sydney Water's Customer Contract. Under the Customer Contract, Sydney Water provides water, wastewater (including recycled water) and stormwater drainage services to a population of around 4 million in the Sydney, Blue Mountains and Illawarra regions. It contracts the delivery of some aspects of these services to private sector firms via a competitive tendering process.

The fundamental need in Sydney's water industry at present is innovation and the provision of new supply sources. To this end, the Tribunal has sought competitive reforms where the potential benefits are likely to be in the form of dynamic efficiency gains (see Appendix B for an explanation for this concept), including increased innovation and more efficient use of water resources.

Sydney Water's retail prices do not reflect the cost of service provision by location. Instead, prices are based on the average cost of supply, and are uniform throughout the region even though the cost of providing water services varies throughout the greater Sydney area ('postage-stamp pricing'). Some alternative service delivery arrangements (such as the disaggregation of Sydney Water) would involve a move away from postage-stamp pricing to more fully cost-reflective pricing. This would raise social equity concerns – for example, if it impacted negatively on customers, in particular low-income households. In considering competitive reforms, the Tribunal has been mindful of the need to maintain equitable pricing of retail water and wastewater services.

The Tribunal is also cognisant of the integrated nature of water and wastewater systems. For example, the competitive capture of water, or stormwater, in one part of the system may affect peoples' 'access' to water in another part of the system. This implies that an integrated approach to Government policy and regulation is required, both within Sydney and across the State more broadly. Co-ordination needs to occur across a range of issues, including public health and safety, planning, and economic and environmental matters.

Sydney submission to the Tribunal's *Investigation into Water and Wastewater Service Provision in the Greater Sydney Region – Issues Paper*, May 2005).

1.3 Overview of Tribunal's recommendations

The Tribunal is of the view that, given the limited experience of competition in water and wastewater, an adaptive management approach to reform should be taken. Rather than defining a preferred 'end state' for the industry, Government policy and industry arrangements should be allowed to evolve, as parties develop a better understanding of the value of water resources and the most efficient means of delivering services.

The Tribunal considered three main approaches for reforming Sydney's water and wastewater industry:

- increasing the scope for competition, private sector involvement and innovation in the industry through the greater and more effective use of competitive procurement by water authorities
- enabling third party access to water and wastewater infrastructure
- restructuring the entire industry by disaggregating Sydney Water Corporation (Sydney Water).

The Tribunal's view is that, at present, the primary focus should be on the first two approaches. This will create a more dynamic market in which private sector participants compete to identify opportunities to provide innovative water and wastewater services that meet customers' needs within an environment of increased water scarcity. Major restructuring of the industry is not required to create such a market, and should not be undertaken in the short to medium term. However, the Tribunal recommends that work on identifying the costs and benefits of disaggregation should continue.

In addition, the Tribunal found that its recommended reforms would necessitate changes to the existing legal and regulatory framework for the water and wastewater industry, to remove barriers to competition and innovation, and to ensure the continued protection of consumers and the broader public interest.

An overview of the Tribunal's findings is presented below.

1.3.1 Making better use of competitive procurement practices

The Tribunal sees that the first step towards opening up Sydney's water and wastewater market to greater competition is requiring water authorities to make better use of outcomes-based competitive procurement practices. In particular, Sydney Water (and other water authorities operating in the Greater Sydney metropolitan area) should be required to make greater use of competitive sourcing to procure additional water supplies. This approach involves the water authority clearly defining the outcome it seeks to achieve (such as a certain quantity and quality of water for a particular use at a particular location) then calling for proposals from potential providers to deliver this outcome – without prescribing the delivery approach.

Competitive sourcing can allow the least-cost combination of measures required to provide additional water supplies to be discovered. Even within the context of the proposed desalination plant and other projects outlined in the Government's Metropolitan Water Plan, the Tribunal believes that there is a significant role for competitive sourcing in identifying and obtaining additional water supplies. In particular, the Tribunal envisages that

competitive sourcing would increase the scope for private sector participation and innovation in the supply of recycled water.

To ensure the efficient uptake of sewer mining, a practice that is likely to feature prominently amongst competitive sourcing proposals and recycled water projects in general, the Tribunal also recommends that the Government establish an appropriate regulatory framework for sewer mining. At the very least, formal dispute resolution procedures relating to sewer mining should be established, including a right to seek arbitration through the Tribunal.

In addition, to assist the governance of competitive sourcing arrangements, the Tribunal recommends that Sydney Water (and other water authorities in the Greater Sydney metropolitan area) internally separates its competitive sourcing activity from the rest of its operations.

The Tribunal believes that Sydney Water should also be required to consider whether more innovative, outcomes-based procurement approaches such as competitive sourcing could be applied to other aspects of its service delivery (such as wastewater management), and whether the scope of its current competitive procurement program could be expanded.

1.3.2 Introducing open access to infrastructure

The second step in increasing competition in Sydney's water and wastewater industry is introducing open access to infrastructure. Under open access, new entrants would be permitted to seek access to water infrastructure to inject potable water and transport it across the water network, competing in retail water services. They would also be permitted to seek access to wastewater infrastructure to compete to collect wastewater from customers, transport it across the network and withdraw it for treatment.

The Tribunal believes that access-based competition should be available to all customers. On this basis, the Tribunal envisages that a new entrant's business proposal would cover all costs associated with its proposed scheme, including those retail costs associated with introducing competition. Such retail costs would not be spread across Sydney Water's asset base, be recovered from Sydney Water's remaining customers or be the subject of a price determination by the Tribunal.

In its Draft Report, the Tribunal recommended that to best support the Government's objective to increase the efficiency, effectiveness and sustainability of water and wastewater service delivery, the access regime should be:

- State-based, to allow the integration of regulatory issues and Government policy matters, which is particularly important given the public health issues associated with water supply, and appropriate in the context of no national market for urban water.
- Based on a negotiate-arbitrate model, with a future review point established to assess the adequacy of the access arrangements and the need for more detailed regulation.

The Tribunal continues to support these recommendations.

1.3.3 Pricing infrastructure access

To retain the current postage stamp pricing arrangements for retail services, and provide for the implementation of a relatively simple and inexpensive approach to facilitating access, the Tribunal recommends that access to water and wastewater infrastructure be priced according to the Efficient Component Pricing Rule (ECPR). This is the methodology the Tribunal will use in arbitrating access disputes.

The price paid for infrastructure access will be a major determinant of the success of open access in creating a more competitive market for water and wastewater services. The Tribunal examined in detail two potential approaches to pricing infrastructure access:

- An average cost allocation, or building block, methodology.
- The Efficient Component Pricing Rule (ECPR).

The Tribunal's preference for ECPR is largely based on the retail pricing outcomes it facilitates. Another advantage is that it can be implemented in the absence of information about the unbundled costs of Sydney Water's services. Because retail prices will continue to be regulated, use of the ECPR will not result in monopoly rents for Sydney Water.

1.3.4 No major industry restructuring, at this time

The Tribunal believes that disaggregating Sydney Water horizontally has the potential to provide opportunities for productive efficiency gains. However, as it cannot be reasonably confident that the benefits would outweigh the costs, it considers there is insufficient justification to pursue this approach at this stage. In addition, given that Sydney's most pressing problem at present is water scarcity, it seems more appropriate to focus efforts and available resources on improving the dynamic efficiency of the industry, which can help to address this problem.

The Tribunal considered whether the horizontal disaggregation of Sydney Water might be used to ensure that the Growth Centres Commission water authority operates at an efficient scale (this would involve transferring assets, functions and customers from an existing Sydney Water service area to the new water authority, effectively disaggregating Sydney Water and creating two similar sized water authorities for the greater Sydney area). It found that while this approach could be used to help achieve a financially viable Growth Centres Commission water authority, several complex issues would need to be addressed. A 'River-Ocean' (or East-West) split of the greater Sydney area would mean that the newly formed businesses would have significantly different cost structures, which would have implications for pricing and cost recovery. Under a 'North-South' split, the cost differentials between the two businesses would be lower, but the technical issues would be more complicated as major infrastructure would need to be shared between the North and South businesses.

In addition, the Tribunal considered whether Sydney Water should be vertically 'unbundled' to aid the development of open access competition. It found that, while this approach has been used successfully in other industries where open access has been introduced, it is not warranted at this time.

While the Tribunal recommends that no major restructuring be undertaken at this time, it believes that work should continue on identifying and, where possible, quantifying the costs and benefits of such reform.

1.3.5 Removing barriers to competition, private sector participation and innovation

To support the development of a dynamic market for water and wastewater services, the Tribunal believes that some aspects of the existing legal and regulatory arrangements for the industry need to be changed. These changes include:

- removing impediments to private sector participation created by a range of statutory provisions
- improving arrangements for the collection and dissemination of information about the water and wastewater market, to better support private sector participation and innovation
- ensuring that clear and robust guidelines and rules are in place for recycled water, to facilitate the matching of water quality to end use
- ensuring that environmental impacts are adequately accounted for and factored into decision-making.

1.3.6 Ensuring continued protection of consumers and the broader public interest

The competitive reforms proposed by the Tribunal will require changes to the existing legal, regulatory and policy framework, to ensure adequate protection to consumers and the broader public interest. Even with an increased level of private sector participation and competition in the water industry, the Government will retain ultimate responsibility for providing this protection and ensuring the community's economic, social, health and environmental needs are met.

The Tribunal believes the following steps should be taken to ensure this continued protection:

- the price of services to both small and large customers should continue to be regulated, and the need for this regulation should be reviewed when an open access framework is established and competition in the provision of services to customers emerges
- the legal and regulatory framework should be reviewed to ensure appropriate obligations are placed on incumbents and new entrants in relation to a range of non-price matters, including security of supply, water quality and public health, environmental impacts and customer contracts.

1.3.7 Implementing regulatory change and reform – the next steps

Given the specific context of Sydney's water and wastewater industry, the Tribunal believes that an 'adaptive management' approach is likely to be most effective in implementing the regulatory changes that would be required as a result of the proposed reforms. Under this approach, the first step would be to establish a set of basic principles and features for the revised regulatory framework, and use the principles to guide and direct short-term decisions made under the existing framework. The next step would be to use the principles and features to guide a review of the existing framework and the subsequent development a revised regulatory framework that is robust, flexible and overarching.

Experience in other industries suggests that the effectiveness of competitive reform depends significantly on the approach to implementation. For instance, establishing clear commitments and timelines for change can minimise the risks of regulatory uncertainty, stifled innovation and investment, or inappropriate investment and risk allocation.

Given the large number of government agencies with some responsibility for water services, the Tribunal believes a central implementation unit should be established. This unit should report to a Cabinet Committee, and be accountable for co-ordinating the implementation program and reviewing and monitoring progress. The Tribunal envisages that the bulk of the detailed development work would be allocated to the relevant (or appropriate) lead agencies and water bodies.

If the Government decides to accept (or substantially accept) the Tribunal's recommendations, the Tribunal believes that the next step should be preparation of a Reform Implementation Plan), which would form the basis of the reform implementation management arrangements. The central co-ordination unit would progressively review and update the Reform Implementation Plan, as appropriate. The Tribunal has prepared an outline for the Reform Implementation Plan (see section 8.3.4), and suggested a lead agency for each phase of detailed development work. The Tribunal recommends that this outline form the basis of a detailed Reform Implementation Plan.

1.4 The Tribunal's recommendations

The Tribunal's specific recommendations to the NSW Government are set out below.

Recommendation 1

That the Government require water authorities in the Greater Sydney metropolitan area to use competitive sourcing to procure additional water supplies.

Recommendation 2

That the Government establish an appropriate regulatory framework for sewer mining. At the very least, formal dispute resolution procedures relating to sewer mining should be established, including a right to seek arbitration through the Tribunal.

Recommendation 3

That the Government require each water authority in the Greater Sydney metropolitan area to separate its competitive sourcing activity from the rest of its operations.

Recommendation 4

That the Government require Sydney Water to consider using more innovative, outcomes-based competitive procurement in other areas of service delivery, and expanding the scope of its current competitive procurement program in general.

Recommendation 5

That the Government establish a state-based access regime for water and wastewater infrastructure, and that the regime is initially based on a 'negotiate and arbitrate' model.

Recommendation 6

That the Government incorporate the Tribunal's recommended framework in the access regime. This framework comprises:

1. *A regulatory mechanism that enables:*
   - (a) *designated people:*
   - (b) *to seek access to all water and wastewater infrastructure:*
     - *that may be specified at the inception of the access regime, and/or*
     - *that meets certain criteria (based on the current Trade Practices Act 1974 tests)*
   - (c) *Contracting freedom for the access seeker and asset owner, provided system integrity, operation, health, etc not jeopardised*
   - (d) *The access seeker and asset owner subject to arbitration by the Tribunal if agreement cannot be reached*
   - (e) *regulatory guidelines or other instrument to be prepared by the Tribunal that:*

- *set out its interpretation of relevant infrastructure asset tests that will be used in deciding whether or not assets should be subject to access*
- *establish relevant pricing principles that should be applied in calculating access prices in arbitration*

2. *A requirement for Sydney Water (and possibly any other access provider) to publish an access policy and indicative access prices.*
3. *A future review point for the Tribunal to assess adequacy of access arrangements/regulation, and inform Government of findings.*

Recommendation 7

That access to water and wastewater infrastructure be priced according to the Efficient Component Pricing Rule (ECPR).

Recommendation 8

That the Government not undertake structural disaggregation of Sydney Water at this time, but continue to examine the benefits and costs of such reform.

Recommendation 9

That the Government review current legal and regulatory arrangements to identify all statutory impediments to private sector involvement and competition in Sydney's water and wastewater markets, and, where warranted, remove these impediments.

Recommendation 10

That the Government improve arrangements for the collection and dissemination of information about the water and wastewater market to better support private sector participation and innovation, and that the Tribunal have regulatory oversight of information arrangements.

Recommendation 11

That the Government ensure that clear and robust guidelines and rules are in place for all potential sources and applications of recycled water, including for:

- *the harvesting and use of urban stormwater*
- *the use of recycled water for a range of key industrial applications*
- *the use of grey water at both the household level and for larger scale applications and uses.*

Recommendation 12

That guidelines and regulations for the use of recycled water be subject to ongoing review and development to ensure that they are comprehensive, clear and outcomes-focused and that they keep pace with the evolution of the market and advances in science, technology and the understanding of health risk.

Recommendation 13

That the Government develop guidelines for valuing environmental impacts associated with the provision of water services in Sydney, and require that these guidelines be applied across all decision makers and government agencies (including the Department of Environment and Conservation, Department of Natural Resources, IPART and Sydney Water).

Recommendation 14

That the prices of water, wastewater and other related services to small customers continue to be regulated by IPART.

Recommendation 15

That where regulated services are not provided by a government agency, the legal basis for price regulation be established.

Recommendation 16

That the prices of water, wastewater and other related services to large customers continue to be regulated, but reviewed if an infrastructure access framework is established and competition for provision of services for large customers emerges.

Recommendation 17

That the Government ensure appropriate regulatory obligations are placed on incumbents and new entrants through a licensing or authorisation regime to protect consumers and the public interest in relation to ensuring security of supply, ensuring water quality and protection of public health, managing environmental impacts, developing, maintaining and extending water and sewerage services, addressing potential effects on customer contracts, and allocating responsibility for managing emergencies and national security matters.

Recommendation 18

That the Government adopt the Tribunal's suggested basic principles for the revised policy and regulatory framework, and use those principles to guide and direct:

- *short-term decisions in the water and wastewater industry made under the existing framework*
- *a comprehensive review of the existing framework and subsequent development of the revised regulatory framework.*

Recommendation 19

That the Government, in reviewing the existing framework and developing the revised legal regulatory framework, also take into account:

- *principles of best practice regulation*
- *national competition reform principles*
- *desirable features and characteristics such as consistent application throughout the state; clear principles for decision-makers; flexibility and adaptability to apply readily to any new entrant; seamless application to all activities and functions; and provision for exceptions that are in the public interest.*

Recommendation 20

That the Government establish a central agency unit, which will report to a Cabinet Committee and be accountable for co-ordinating implementation of reform and reviewing and monitoring progress.

Recommendation 21

That the Government develop a detailed reform implementation plan, building on the Tribunal's proposed outline, that includes a clear vision for reform, an outline of the immediate next steps and appropriate sequencing for subsequent areas of work.

Recommendation 22

That the Government progresses implementation in accordance with a pragmatic approach and timetable that recognises the magnitude of potential improvements that may be gained, the relative ease of effecting change, and a logical sequencing of decisions.

1.5 Structure of this report

The following chapters discuss each of the components of the Tribunal's proposed competitive reform program in detail:

- Chapters 2 and 3 set out the Tribunal's findings and recommendations in relation to making better use of competitive procurement practices and introducing open access to infrastructure.
- Chapter 4 looks at the various options for pricing access to infrastructure, and explains why the Tribunal prefers the ECPR approach.
- Chapter 5 sets out the approaches to and goals for disaggregating Sydney Water, and explains the Tribunal's analysis and conclusions on each.
- Chapters 6 and 7 discuss the legal and regulatory changes required to remove the barriers to competition and innovation, and to ensure the continued protection of consumers and the broader public interest.
- Chapter 8 sets out the Tribunal's findings and recommendations in relation to the approach to regulatory change and the management of the reform process.

2 MAKING BETTER USE OF COMPETITIVE PROCUREMENT PRACTICES

The Tribunal maintains its position outlined in the Draft Report that the first step towards opening up Sydney's water and wastewater market to greater competition should be to require water authorities to make better use of outcomes-based competitive procurement practices. In particular, the Tribunal believes that Sydney Water (and other water authorities operating in the Greater Sydney metropolitan area) should be required to make greater use of competitive sourcing to procure additional water supplies. This approach involves the water authority clearly defining the outcome it seeks to achieve (such as a certain quantity of water for a particular use at a particular location) then calling for proposals from potential providers to deliver this outcome – without prescribing the delivery approach.

Competitive sourcing can allow the least-cost combination of measures required to provide additional water supplies to be discovered. It can also potentially increase the diversity of supply options, and therefore make the management of security of supply more robust. Sydney Water suggests that opportunities for competitive sourcing may lie in areas other than bulk water supplies, as it is proceeding with competitive procurement arrangements for a desalination plant, which will provide additional bulk water supplies to Sydney.[4] However, the Tribunal believes that there is still a significant role for competitive sourcing in identifying and obtaining additional water supplies, even within the context of the proposed desalination plant and other projects outlined in the Government's Metropolitan Water Plan. In particular, it envisages that competitive sourcing would increase the scope for private sector participation and innovation in the supply of recycled water.

More generally, the Tribunal retains its view that Sydney Water should also be required to consider whether more innovative, outcomes-based procurement approaches such as competitive sourcing could be applied to other aspects of its service delivery, and whether the scope of its current competitive procurement program could be expanded.

The Tribunal's findings and recommendations in relation to competitive sourcing of additional water supplies and Sydney Water's general approach to competitive procurement are discussed in detail below. This analysis, which builds on (rather than significantly changes) the contents of the Tribunal's Draft Report, also includes a discussion on sewer mining and a recommendation aimed at encouraging its efficient uptake.

2.1 Use competitive sourcing to procure additional water supplies

The Tribunal believes that the use of competitive sourcing to procure additional water supplies has the potential to increase the level of competition and innovation in Sydney's water and wastewater industry. This approach has been used successfully in other industries to create opportunities for new players to participate in the industry and strengthen incentives for innovation. It can be implemented without significant change to Sydney's current water industry structure. Therefore, it is a logical first step towards opening the industry up to competition. It also provides a logical transition path towards higher levels of competition, such as establishing an open access regime (discussed in

4 Sydney Water Corporation submission to IPART, *Investigation into Water and Wastewater Service Provision in the Greater Sydney Region – Draft Report*, September 2005, p 1.

Chapter 3). In addition, it is consistent with the Tribunal's adaptive management approach to reform of the water industry (discussed in section 1.3 and Chapter 8).

The following sections provide more detail on:

- what is meant by competitive sourcing
- competitive sourcing and the Government's Metropolitan Water Plan
- sewer mining, which is likely to feature prominently amongst competitive sourcing proposals
- the experience with this approach in other jurisdictions and industries
- the potential benefits of requiring Sydney's water authorities to make greater use of competitive sourcing to procure additional water supplies
- the views of stakeholders on competitive sourcing, and the Tribunal's response to these views
- the key issues that would need to be addressed to implement this approach.

2.1.1 What does competitive sourcing mean?

In the context of this review, the Tribunal uses the term competitive sourcing to mean competitive procurement of a clearly defined service outcome where the processes or approaches to be used to deliver this outcome are not specified in detail. To use competitive sourcing to procure additional water supplies, a water authority would define the outcome it seeks – for example:

- supply of a certain volume of bulk water for potable use, at a particular location and for a particular time period
- supply of a certain volume of bulk water for non-potable use, at a particular location and for a particular time period
- supply of 'end use' water to a new population centre of 20,000 households, with the flexibility for the solution to include a combination of potable water and non-potable water, subject to this solution being acceptable to customers and being in compliance with health and environmental requirements.

It would then call for proposals to deliver this outcome and leave it to potential providers to identify how this can be done, without placing unnecessary constraints on the delivery approach.

In response, one private sector proposal may, for example, involve large-scale sewer mining, treatment and the provision of distribution infrastructure to provide non-potable water for industrial, irrigation and/or environmental use (sewer mining is discussed further in section 2.1.3 below). Other proposals could include, for instance, pumping water from other locations/storages, constructing a desalination plant, capturing and reusing stormwater[5] (for non-potable use), or re-configuring existing infrastructure (eg, storages, pumping stations) to increase capacity. A water authority may also develop its own proposal in-house or in

[5] Atlantis Corporation's submission to the Tribunal provides an example of stormwater capture and reuse technology. (Atlantis Corporation Submission to IPART, Investigation into Water and Wastewater Service Provision in the Greater Sydney Region – Draft Report, September 2005.

conjunction with other Government agencies, and evaluate this proposal alongside those submitted by private sector firms.

In assessing the alternative proposals, the water authority would seek to identify the most efficient, effective and sustainable means of delivering the required outcome. The issues it might consider include the cost-effectiveness of proposals, the reputation and track record of the potential providers, the risks associated with the proposal, environmental and health requirements and objectives, the appropriateness and reliability of the proposed water source, and the extent to which it can be confident about the timing and delivery of outcomes.

Competitive sourcing differs from Sydney Water's current competitive procurement arrangements. Under these arrangements, the water authority (often in conjunction with other Government agencies) determines the approach to be taken to deliver the required outcome and plans a project to implement this approach, which can include specifying the details of the engineering solution required. It then competitively procures various inputs to the project, or tenders for private sector provision of the entire project (eg, via a build-own-operate scheme).

The current approach can produce a level of competition that minimises the cost to Sydney Water and exposes it to a range of technological options.[6] However, greater use of competitive sourcing can facilitate a much greater level of private sector innovation in the supply of water resources, expose the water authority to a greater range of technological options and thus increase the potential for efficiency gains.

2.1.2 Competitive sourcing and the Metropolitan Water Plan

The Metropolitan Water Plan (the Plan) is the NSW Government's strategy to ensure that Sydney has enough water for consumption and environmental purposes over the next 25 years.[7] It contains a mix of supply augmentation and demand management measures, and will be reviewed every 5 years.

The Plan has already identified several specific infrastructure projects to provide additional water supplies – namely, modifying dams to allow the extraction of previously inaccessible deep water, increasing transfers of surplus water from the Shoalhaven, and a desalination plant. In particular, the recently announced desalination plant for Sydney may affect the scope for competitive sourcing. This impact will depend on the size of plant and its contractual arrangements, which are yet to be determined.

However, the Tribunal believes that there is still likely to be a role for competitive sourcing of bulk water supplies within the context of the Plan. For instance, in implementing the Plan's recycled water initiative for Sydney, water authorities (and/or other Government agencies) could increase the scope for private sector innovation by adopting a competitive sourcing, outcomes-based, approach in obtaining these additional water supplies.[8] According to the Plan, "The Government wants to see Sydney's recycling levels reach much

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6 For example, see discussion on page 1 of Chapman R & Cuthbertson S, "Sydney's Water – A Suitable Case for Private Treatment?", *Public Policy for the Private Sector*, Note No.80, April 1999.

7 NSW Government, *Meeting the challenges: Securing Sydney's water future, The Metropolitan Water Plan*, October 2004.

8 The Metropolitan Water Plan (p 15) estimates that, to assist in meeting Sydney's demand and the Government's environmental objectives, recycling could provide 60 billion litres per year by 2020.

greater levels by 2029. Recycling is an integral part of its comprehensive strategy to ensure that the residents and businesses of the greater Sydney area have enough water to meet their needs for at least the next 25 years. It is also a key initiative to restore the health of the Hawkesbury-Nepean River and other river systems around Sydney."[9]

The competitive sourcing process can also help to inform the review of the Plan: it could be a component (or strategy) of any revised Plan; or be used to identify potential options and specific projects for inclusion in revised versions of the Plan. In Western Australia, the Water Corporation's *Source Development Plan 2005-2050*, which is aimed at ensuring that Perth's water supply is able to match its demand, identifies projects to obtain new supplies of water. These proposals include a desalination plant, purchasing irrigation water, extracting groundwater from the South West Yarragadee Aquifer and specific water recycling schemes. However, the Source Development Plan is subject to periodic review and the Water Corporation has indicated that it is interested in all potential source proposals, including those put forward by independent parties (see Box 2.2).

The Metropolitan Water Plan's Demand Management Fund, which will provide $30 million per annum to the most efficient water conservation programs put forward by businesses and Councils, is a form of competitive sourcing. It is likely that the Demand Management Fund will be applicable to smaller-scale, more localised, projects than those identified under a competitive sourcing approach to procuring additional water supplies. Nevertheless, over time (if both approaches endure and prove to be successful), consideration should be given to integrating the Demand Management Fund with Sydney Water's competitive sourcing program (as well as the competitive sourcing program of other water authorities operating in the Greater Sydney metropolitan area), to avoid duplication and streamline the process for 'procuring' additional water supplies and/or savings.

2.1.3 Sewer Mining

Sewer mining is likely to feature amongst competitive sourcing proposals. It is also likely to feature amongst recycled water projects that are external to the competitive sourcing process (ie, those that produce water that is not sold through Sydney Water or other Government owned water authorities). Box 2.1 below describes the sewer mining process, including how it differs from what the Tribunal refers to as "access". Pricing and regulatory arrangements for sewer mining are also discussed below.

[9] Ibid, p 13.

Box 2.1 Sewer Mining, and its relationship with 'access'

Sewer mining involves the extraction of raw effluent from the wastewater system (by a party other than the operator of that network), usually for the purpose of treating the effluent and subsequently selling or using it as recycled water. As set out by the National Competition Council (NCC),[10] there are a number of examples of sewer mining projects in Australia: at Sydney Olympic Park (SOPA),[11] Flemington Racecourse in Melbourne and Southwell Park in the Australian Capital Territory. In order to sewer mine in Sydney, third parties need to connect to the wastewater system; negotiating with Sydney Water the terms and conditions of connection and effluent extraction.

Sewer mining is a different arrangement to what the Tribunal refers to as "access" (see Chapter 3 and Appendix D). Access to the wastewater network involves the transportation of raw effluent across the system, supported by a contract for the collection of effluent between the third party access seeker and customers, who now pay wastewater charges to the third party access seeker. Sewer miners extract effluent for the purpose of using recycled water on-site or for re-selling recycled water to other users. Sewer miners do not receive wastewater charges from customers. Such revenue continues to be paid to Sydney Water, even though the extracted effluent may be treated by the sewer miner.

The price of sewer mining

The Tribunal regulates the price of sewer mining. In its 2003 metropolitan water price determination,[12] the Tribunal set the maximum price for sewer mining at zero, requiring Sydney Water to provide access to the sewer for extractive purposes on a full cost recovery basis. Where a recycling scheme has the potential to lower wastewater treatment and disposal costs for the incumbent provider of wastewater services, pricing at zero could be an inefficient impediment to that scheme. It may be appropriate to have a negative price or 'credit' for sewer mining.

Such a credit would reflect reasonable estimates of the avoided costs of wastewater service provision. This is consistent with the Tribunal's recommended approach to pricing access to infrastructure (set out in Chapter 4), ie the Efficient Component Pricing Rule (ECPR). An ECPR approach to calculating the sewer mining credit would involve estimating the costs Sydney Water would avoid if the sewer mining scheme proceeded ('avoided costs'), ie, the cost of treating and disposing of wastewater. As noted in the Draft Report, estimates of the avoided costs for Sydney Water's wastewater services appear low, so any credit is likely to be small. The Tribunal will examine the price of sewer mining as part of its upcoming review of recycled water prices, with the starting point being the Tribunal's disposition to favour an ECPR approach to pricing.

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10 National Competition Council, *Final recommendation on the Services Sydney application for declaration of Sydney sewerage network services*, February 2005.

11 SOPA is authorised to exercise functions relating to its Water Reclamation and Management Scheme (WRAMS) in its area of operation. These functions include the collection and treatment of wastewater and the distribution of treated wastewater (recycled water). (See SOPA submission to the Issues Paper for this review.)

12 IPART, *Sydney Water Corporation – Prices of Water Supply, Wastewater and Stormwater Services from 1 July 2003 to 30 June 2005*, May 2003.

Other regulatory arrangements

Price is currently the only term or condition of sewer mining that is regulated. The other terms and conditions, including the right to connect to the system and extract effluent, are a matter of negotiation between the third party and Sydney Water. The Tribunal notes the NCC's finding that the current arrangements do not provide for any dispute resolution mechanism and that while recourse to the courts may be available if Sydney Water acts in a manner inconsistent with its statutory obligations, such a process is uncertain and time consuming. Given the likely importance of sewer mining in the provision of additional (non-potable) water supplies, the Tribunal believes that consideration should be given to the appropriate regulatory framework for sewer mining. The Tribunal recommends that, at the very least, formal dispute resolution procedures relating to sewer mining should be established, with a right to seek arbitration through the Tribunal.

Section 2.1.7 and Chapter 6 discuss the removal of impediments to private sector participation in the water industry, including proposals that involve sewer mining. In addition, as set out in Chapter 7, private sector participation should be accompanied by a review of the applicable legal and regulatory framework to ensure that appropriate obligations are placed on incumbents and new entrants in relation to issues such as environmental impacts, water quality and public health. While the form of regulatory instrument used will be the subject of further consideration, the Tribunal suggests that it may be some form of licensing or authorisation regime.

2.1.4 Experience in other jurisdictions and industries

Competitive sourcing techniques have been used in other utility sectors for a long time. For example, in the electricity sector, it is common practice in other countries and in some States in Australia for a utility to define future electricity supply requirements and then call for tenders, leaving it up to potential providers to define the details of the proposed fuel supply, generation technology, location, and procurement processes, etc.

As discussed above (and in Box 2.2), competitive sourcing of water supplies is being adopted in a limited way in Western Australia.

Singapore's national water agency, the Public Utilities Board (PUB), uses a "Best Sourcing" approach to contracting with the private sector for the provision of water services. Recently, this has involved engaging the private sector in Design-Build-Own-Operate (DBOO) arrangements for a recycled water plant (at Ulu Pandan) and a desalination plant (at Tuas). Under these arrangements, PUB specifies its performance requirements (ie, water quantities and qualities required for indirect potable use and industrial use), leaving it up to the private sector to determine the most efficient way to design, build and operate the plant to meet these requirements. While not pure 'competitive sourcing' of additional water supplies (as the means of providing this water is prescribed to an extent - in the sense that the private sector was engaged to design, build and operate a 'recycled water plant' and a 'desalination plant'), this arrangement still represents a move to a more outcomes-focused approach to competitive procurement. The "Best Sourcing" approach in relation to the Ulu Pandan recycled water plant is discussed further in Box 2.2.

Box 2.2 Source development proposals in Western Australia and 'Best Sourcing' in Singapore

Source development proposals in Western Australia

The Western Australian Water Corporation's *Source Development Plan 2005 - 2050* identifies specific projects/proposals to obtain new sources of water for Perth. However, the Water Corporation also acknowledges that sources additional to those listed in the plan could be required within the next decade, to ensure that Perth's water supply matches it demand. This is because of uncertainty regarding access to groundwater, climate and water consumption levels.

Therefore, in addition to the options proposed in its Source Development Plan, the Water Corporation has indicated that it will consider other water source/augmentation proposals, including those put forward by independent parties.[13] To date, it has received and considered several proposals from the private sector.[14] Its key considerations in assessing these projects include:

- cost-effectiveness
- social and environmental impacts
- the speed that potential sources can obtain the required approvals
- reliability of the water source
- certainty of the project based on complexity and the degree to which planning, investigation and approval has been advanced.[15]

"Best Sourcing" water services in Singapore

Currently, there are three existing NEWater plants in Singapore, with a combined production capacity of 96,000m^3/day ('NEWater' is recycled or reclaimed water, which is used for indirect potable and industrial purposes). Two of these plants were delivered through the 'build to design' delivery concept. This involves the engagement of consultants to develop the detailed design of the NEWater plants, followed by the appointment of contractors to build the NEWater plants in accordance with the design. To leverage the innovation of the private sector, the third NEWater plant was designed and built by the contractor. Such a design and build package enhances the synergy of the design and construction processes.

With experience gained from these three plants, Singapore's Public Utilities Board (PUB) has moved a step further with the fourth NEWater plant by contracting with the private sector under a Design-Build-Own-Operate (DBOO) arrangement. It is thought that such an approach will provide even greater scope for synergies (in design, construction and maintenance) and private sector innovation.

In January 2005, PUB entered into a 20-year NEWater agreement with Keppel Seghers NEWater Development Co Pte Ltd (Keppel Seghers). Under the agreement, Keppel Seghers will design, build, own and operate Ulu Pandan NEWater plant and sell reclaimed water to PUB for indirect potable and industrial use. Keppel Seghers' main obligation is to produce water that meets the product water qualities specified in the agreement, at the warranted capacities of 116,000m^3/day for indirect potable water and 46,000m^3/day for industrial water. PUB's obligation is to provide feedwater in the form of secondary treated effluent (which meets the quality specifications). In order to give the public assurance that the qualities of both these types of water, produced by a private company, will not be compromised, a comprehensive monitoring and audit system will be put in place to allow PUB to regularly check on the water quality and operation and maintenance of the plant.[16]

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13 Economic Regulation Authority, *Inquiry on Urban Water and Wastewater Pricing – Draft Report*, Western Australia, March 2005, pp 38-41.

14 ibid Appendix 5, pp 187-189. Proposals received include: United Utilities Australia to meet the potable water needs of the Goldfields by desalinating seawater in Esperance and transporting it via a pipeline to Kalgoorlie-Boulder; Agritech Smartwater has proposed a scheme to supply potable water to the Water Corporation based on the desalination of water from Wellington Dam; Tenix Group has proposed a scheme to transport water from the Fitzroy River to Perth by means of a 3,700 km canal.

15 A 'certainty rating' has been developed ranging between high and low to guide as a guide to the level of project progression.

16 Siong Teck and Hian Hai, "Ulu Pandan NEWater – Design Build Own and Operate (DBOO) Project", paper presented at the 1st IWA-ASPIRE Conference and Exhibition, Singapore, July 2005.

2.1.5 Benefits of competitive sourcing

The Tribunal's review of the use of competitive sourcing in other industries and jurisdictions suggests that its greater use in Sydney's water industry can potentially provide a range of benefits. By calling for proposals to deliver the required outcomes, rather than prescribing the specific delivery approach or means of achieving these outcomes, competitive sourcing could:

- Increase the scope for private sector competition and innovation, and provide incentives for potential service providers to identify and solve the economic and technological challenges to exploiting water and wastewater resources and providing water services.
- Allow the least-cost combination of measures required to provide additional water supplies (and meet health and environmental requirements) to be discovered, and therefore facilitate a more optimal use of water resources.
- Potentially increase the diversity of supply options, and thus make the management of security of supply more robust.
- Allow the water authority and Government to focus on managing risks, uncertainties and trade offs that need to be considered in planning.

Requiring Sydney's water authorities to make greater use of this approach to procure additional water supplies recognises that the market for water services is evolving. This market evolution is occurring in response to factors such as the increasing scarcity and cost of water from conventional sources, greater recognition that water quality needs only to be *fit for purpose*, and technological developments (such as new treatment technologies and methods of hydraulic, hydrological and geo-hydrological management). This increases the scope for alternative sources of water via, for example, water reclamation and recycling schemes.[17] It also makes it difficult for any one agency to prescribe the most efficient and effective means of providing water services, and increases the scope for competitive sourcing of water services.

2.1.6 Stakeholder views

The stakeholders who commented on the use of competitive sourcing in submissions to the Tribunal's Issues Paper and Draft Report generally support the Tribunal's recommended approach. For example, the Australian Council for Infrastructure Development (AusCID) endorses competitive sourcing to procure additional water supplies.[18] PIAC notes that the benefit of competitive sourcing is that it retains the existing industry structure, therefore minimising the transaction costs and risks associated with industry reform.[19]

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17 CSIRO, *Wastewater Re-use, Stormwater Management and the National Water Reform Agenda*, CSIRO Land and Water Research Position Paper 1, Report to the Sustainable Land and Water Resources Management Committee and to the Council of Australian Governments National Water Reform Task Force, 1997.

18 AusCID submission to IPART, *Investigation into Water and Wastewater Service Provision in the Greater Sydney Region - Draft Report*, October 2005.

19 Public Interest Advocacy Centre (PIAC) submission to IPART, *Investigation into Water and Wastewater Service Provision in the Greater Sydney Region – Issues Paper*, June 2005.

AGL supports the Tribunal's competitive sourcing recommendations, with two qualifications:

- Sydney Water should not own and operate any new source of supply, as separation of competitive activities from monopoly infrastructure will "ensure that supplies to Sydney Water are costed transparently, both as a signal to Sydney Water in the conduct of its operations, and as a signal to potential suppliers." According to AGL, this separation will also "ensure clarity of Sydney Water's role in sourcing and distributing supplies as opposed to production, and avoid the need for subsequent separation if structural disaggregation of Sydney Water is undertaken at some time in the future. It is also consistent with the separation that has occurred in other industries as a precursor to open access."
- Prior to the establishment of a competitive sourcing program, Sydney Water should not be prevented from entering into new binding arrangements, "especially in view of Sydney's current supply problems." Furthermore, whatever arrangements are established for competitive sourcing, "Sydney Water should also have the discretion to enter into new arrangements without going to competitive bids, for example, to take advantage of opportunities which are unique in terms of innovation, technology or timing/availability."[20]

The Tribunal broadly supports these points. In line with the principles of competitive neutrality, the Tribunal believes that it would be inappropriate for Sydney Water to own and operate any new source of water supply, due to the potential for competition between alternative sources of water supply. Competitive procurement is normally the best way to identify the optimal solution or 'best deal'. However, the Tribunal acknowledges that on rare occasions there may be unique opportunities that arise which justify bypassing the *competitive* process (eg, due to special features of the project that are unlikely to be matched or replicated by potential competitors and when timing/availability is critical). In these circumstances, care must be taken when deviating from the competitive process.

AGL states that "Sydney Water's supply situation is currently complicated by the Government's policy decision to build a desalination plant when raw water is available to Sydney Water from the Sydney Catchment Authority in contractually unrestricted quantities, but not sustainably, at less than 20 cents/kL."[21] Sydney Water also casts doubt on the scope for competitive sourcing of bulk water supplies. While supportive of outcomes-based procurement, it suggests that the proposed desalination plant means that opportunities for competitive sourcing may lie in areas other than bulk water supplies.[22]

In response to these submissions, the Tribunal notes the following. The supply from the Sydney Catchment Authority is limited and, in the absence of additional water supplies and/or savings, unlikely to be sufficient to meet demand over the long-term (as highlighted by the Government's Metropolitan Water Plan). As set out in the Tribunal's recent determination of metropolitan water prices[23], estimates of the cost of water from additional sources (the Long Run Marginal Cost of water) range from $1.20 to $1.50 per kL – which is the approximate price range that competitive sourcing proposals would be competing in (not

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20 AGL's submission to IPART, *Investigation into Water and Wastewater Service Provision in the Greater Sydney Region - Draft Report*, September 2005, p 4.

21 Ibid.

22 Sydney Water Corporation's submission to IPART, *Investigation into Water and Wastewater Service Provision in the Greater Sydney Region - Draft Report*, September 2005, p 1.

23 Ibid, p 18.

20 cents/kL). As previously mentioned, the Tribunal acknowledges that the proposed desalination plant may affect the scope for competitive sourcing of additional water supplies (depending on the contractual arrangements with the private sector and the capacity of this plant, which are yet to be determined). However, the Tribunal is of the view that there is still likely to be a significant role for competitive sourcing in identifying and obtaining additional water supplies. In particular, it believes that a competitive sourcing approach should be used in implementing the Government's water recycling strategy (which is outlined in the Metropolitan Water Plan), to increase the scope for private sector participation and innovation.[24]

In its submission to the Draft Report, Sydney Catchment Authority's (SCA) main concern seems to be the potential for the stranding of assets (its existing assets and major infrastructure investments being made under the Metropolitan Water Plan).[25] However, the Tribunal notes that it is extremely unlikely that SCA's existing assets would be stranded, given that they provide the lowest cost water available and additional sources of water are estimated to be significantly more expensive.[26] If planned or future assets are stranded, it would be due to the presence of more efficient sources of water in the 'market' (hence, a result of competition producing efficiency gains). This is a transitional issue associated with competitive reform, which has had to be considered in other utility industries (such as electricity generation). If asset stranding does occur, the Tribunal would consider ways of addressing this issue on a case-by-case basis.

2.1.7 Implementation issues

The Tribunal has not identified any significant barriers to increasing the use of competitive sourcing for procuring additional water supplies – either in the existing Sydney Water service area or in the new growth areas.[27] This approach can be implemented within the current industry structure. It can also be implemented in a way that is consistent with an adaptive management approach to industry reform. For example, Sydney Water could initially adopt a 'pilot' approach, by using competitive sourcing to meet some of its required service outcomes, while continuing to rely on proposals developed by Government (Sydney Water in conjunction with other Government agencies) to meet others. Also, when using the competitive sourcing approach, Government could develop its own proposals, and evaluate these alongside those it receives from potential private sector players.[28] (As discussed above,

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24 The Metropolitan Water Plan (p 15) assumes a 100 megalitre per day desalination plan, which would provide 36.5 billion litres of water per year – although, depending on the outcome of the Government's evaluation process, the plant may end up having a larger capacity than this. It also estimates that, to assist in meeting Sydney's demand and the Government's environmental objectives, recycling could provide 60 billion litres per year by 2020.

25 SCA submission to IPART, *Investigation into Water and Wastewater Service Provision in the Greater Sydney Region - Draft Report*, October 2005.

26 As mentioned above, the Long Run Marginal Cost of Water is estimated to range from $1.20 to $1.50 per kL. This compares to the current short run marginal cost of water from SCA's existing storage network of about $0.06 per kL.

27 The Tribunal understands that further development and implementation of competitive sourcing would essentially require a strategic decision by Sydney Water's board, management and shareholders. In discussing "competitive contracting" in its submission to the Tribunal's Issues Paper, Sydney Water (p 26) suggests that the vehicle for greater use of competitive processes could be through its Statement of Corporate Intent, which is negotiated annually with Sydney Water's shareholding Ministers.

28 In calling for bids for a privately built, owned, and operated (BOO) system for water treatment, Sydney Water's Board "prepared its own reports and design plans, giving it a fallback option should the BOO approach have to be abandoned for some reason." (Chapman R & Cuthbertson S, "Sydney's Water – A Suitable Case for Private Treatment?", *Public Policy for the Private Sector*, Note No.80, April 1999, p 1).

the Tribunal believes that it would be inappropriate for Sydney Water to own any new sources of water supply.)

However, a number of measures are required to support competitive sourcing. This includes the provision of appropriate system/resource information and the removal of legislative barriers to private sector involvement in the provision of bulk water supplies. Competitive sourcing will also require that outcomes are clearly and appropriately defined, and that suitable methodologies, analysis tools and commercial processes are developed. The implications for governance and regulatory arrangements would also need to be addressed.

Providing information on the water market

The provision of timely information, in terms of the water supply needs of the system, would assist potential providers in identifying emerging investment opportunities and the possible timing for new investments, and hence assist these potential providers in identifying and developing proposals for new sources of water. Section 6.2 discusses "improving arrangements for the collection and dissemination of system and resource information."

Removing legislative barriers

There are several statutory impediments to private sector involvement in the water industry. For example, AGL points out that, if the private sector is to be become involved in the provision of water infrastructure, an important requirement is the right to access land and lay pipe (AGL notes that the *Water Management Act 2000* provides these rights already, but only to water supply authorities).[29]

To facilitate competitive sourcing, statutory impediments to private sector participation in the provision of water and wastewater services (and associated infrastructure) should be identified and, where warranted, removed. This issue is discussed further in section 6.1.

Developing appropriate methodologies, analysis tools and commercial processes

To make effective use of competitive sourcing, and outcomes-based procurement in general, utilities typically need to acquire new expertise and significantly change their approach (or 'culture') to planning, evaluating options and delivering services. Traditionally, water authorities have required technical and engineering expertise. Greater use of competitive sourcing will mean that they also require expertise in clearly defining service requirements and outcomes within the overall portfolio of supply resources, and managing 'smart' competitive processes.

Different options will have different cost structures, timeframes and risk profiles. For instance, a proposal to supply non-potable water to a relatively small number of large industrial customers may be at greater risk of experiencing a shortfall in demand and having assets stranded (eg, due to one or two large customers closing down or relocating) than a proposal supplying a larger number and greater mix (residential and industrial) of customers. To effectively evaluate the alternatives 'discovered' during the competitive proposal process, water authorities will need to develop a transparent and objective way to assess the delivery risks associated with various solutions, and trade off timeframes, the certainty of demand projections and the flexibility of the project.

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[29] AGL submission to IPART, *Investigation into Water and Wastewater Service Provision in the Greater Sydney Region - Draft Report*, September 2005, p 3.

In traditional project approaches, these trade-offs are addressed during the detailed planning process, and decisions are taken about the risks involved (such as stranding assets, and over capacity). Where the volume and location of a supply source is known and there is little uncertainty around demand, these trade-offs are relatively simple. However, where there is greater uncertainty, analysis that is more complicated is required.

Evaluation tools such as 'real options' analysis can be applied to assist planning and decision-making.[30] These tools are particularly valuable where there is a range of alternative scenarios, there is a high degree of uncertainty, and uncertainty is expected to reduce over time as further information is gained. They can be applied at a detailed planning level (as part of more traditional planning approaches), and also provide an objective way to assess proposals received as part of a competitive sourcing process.

Greater use of competitive sourcing is also likely to require water authorities to make changes to their commercial and contracting processes. For example, to ensure that potential providers and the water authority have a clear, mutual understanding of the required outcome, and the degree of flexibility in how this requirement could be delivered, there will need to be allowance for considerable dialogue between the parties in the planning stage. It is likely that the first stage of the competitive sourcing process would involve the water authority releasing an expression of interest (eg, for an approximate volume of potable or non-potable water, for a particular location or geographic region, and for an approximate period of time or number of years). Several iterations may then be required before the definition of the required outcome is finalised.

Water authorities will also need to ensure that their contracting processes are flexible, to enable contracts to be developed that address the specific risks associated with each project. Contracting processes can optimally allocate risks between water authorities and private sector providers. They can also potentially mitigate the overall level of risk associated with a proposal. For those proposals requiring significant investment in sunk assets, potential suppliers' may require long-term 'take or pay' contracts with the water authority. While shifting demand risk to the water authority, such long-term contracts can also potentially allow the water authority to secure a long-term cost advantage. Staging projects can help to manage risks, as the water authority retains the flexibility in future supply options and the risks to the private sector can be minimised.

Precedents for more flexible and innovative competitive contracting processes exist in government, as well as the private sector. For instance, the Australian Department of Defence has experience using more flexible tender processes – particularly for large-scale projects where it may have a defined requirement, but no detailed solution or statement of work. Under these circumstances, it may first call for expressions of interest, before identifying a preferred tenderer and working with that company to develop and agree upon a statement of work (ie, the detailed solution to meet its required outcome).

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30 The Real Options approach explicitly addresses uncertainty and the value of future information in the selection and formulation of alternatives. It is suited to situations in which a project (or some of its components) can be delayed, and where there are adjustment costs in reversing a project or its components. See, eg, Zhao, Jinhua, "Uncertainty, Irreversibility and Water Project Assessment," *Water Resources Update*, January 2002, issue 121, pp 51-57.

In the course of the Tribunal's review, several key stakeholders raised concerns about the need for more sophisticated planning and analysis tools if Sydney Water is to effectively use competitive sourcing. This suggests that a logical first step towards implementing this approach would be for the Government to request that Sydney Water takes the lead in developing a program of work, which may include establishing an industry working group, to develop the methodologies, analysis tools and commercial processes that will be required.

Addressing the implications for governance and regulatory arrangements

Effective governance of competitive sourcing arrangements could be assisted by separating the competitive sourcing activity from the water authority's other activities. A separate competitive sourcing unit can consolidate expertise and experience in this area, and help to ensure that proposals are subject to objective consideration. The degree of separation could range from accounting separation to full legal separation. The Tribunal recommends that the competitive sourcing activity initially form a stand-alone operational group within a water authority, supported by accounting separation.

Competitive sourcing should not affect the water authorities' regulatory obligations. Where a water authority procures services from external providers, it retains primary responsibility for meeting its regulatory obligations. However, its contracts with its service providers should reflect those obligations. The Tribunal understands that this is what currently occurs with Sydney Water's water quality obligations and the existing build-own-operate contracts for water filtration plants.[31]

In the context of this review, the Tribunal notes that competitive sourcing could be implemented separate from or as part of other potential changes. For instance, while competitive sourcing provides a logical step towards more competitive open access arrangements, it could also be an end point for reform.

Recommendation 1

That the Government require water authorities in the Greater Sydney metropolitan area to use competitive sourcing to procure additional water supplies.

Recommendation 2

That the Government establish an appropriate regulatory framework for sewer mining. At the very least, formal dispute resolution procedures relating to sewer mining should be established, including a right to seek arbitration through the Tribunal.

Recommendation 3

That the Government require each water authority in the Greater Sydney metropolitan area to separate its competitive sourcing activity from the rest of its operations.

[31] Were external providers to deal directly with customers such that prices or service standards are affected, or third parties affected by those dealings, then the regulatory regime should expressly apply to those external providers.

2.2 Consider using outcomes-based procurement in other areas and expanding the current competitive procurement program

As explained in the Draft Report, the Tribunal believes there may also be potential benefits in using innovative, outcomes-based approaches to competitive procurement in other areas of service delivery. It is also of the view that there may be potential to expand the scope of Sydney Water's current competitive procurement program, to achieve efficiency gains.

2.2.1 Using more innovative, outcomes-based procurement practices in other service areas

Sydney Water could potentially use outcomes-based approaches, similar to competitive sourcing, to procure a range of service requirements, and thus extend the scope for increased innovation to other areas of its operations. In doing so, it should first focus on service areas where the potential benefits from dynamic efficiency gains are likely to be greatest. Wastewater management is likely to be one such area, although innovative approaches to wastewater management may also become apparent via competitive sourcing for additional water supplies (as water recycling schemes could also be seen as providing a wastewater treatment and disposal service).

Other innovative approaches to competitive procurement could also be considered. There are examples in other countries of water utilities not only increasing the extent to which they competitively procure services, but also becoming more innovative in how they structure contracts or calls for tenders. For example, section 2.1.4 outlined Singapore's "Best Sourcing" approach to contracting with the private sector to Design Build Own and Operate (DBOO) a water recycling plant and a desalination plant, which is intended to enhance the scope for innovation and efficiency in plant design, construction and operation. In Toulon, France, the water utility has awarded a 5-year contract to a firm to reduce water losses from the system under which the contractor's only payment is a 50 per cent share of the value of water saved.[32]

Sydney Water endorses the greater use of outcomes-based competitive procurement, "providing its use is determined by reference to the relative cost effectiveness of external provision compared with internal provision, and is subject to Government policy."[33] AGL "strongly" supports the adoption of outcomes-based procurement practices and the expansion of Sydney Water's competitive procurement program generally; however, it believes that one of the key requirements for private sector participation in this activity will be access to relevant information. Improved arrangements for the collection and dissemination of information are discussed in Chapter 6.[34]

The Tribunal believes that the implementation issues associated with using more innovative and outcomes-based approaches to competitive procurement in other areas of service delivery are likely to be similar to those for using competitive sourcing in procuring water supplies (discussed in section 2.1.7 above).

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32 Webb M & Ehrhardt D, "Improving Water Services through Competition", *Public Policy for the Private Sector*, Note No.164, December 1998, p 6.

33 Sydney Water Corporation's submission to IPART, *Investigation into Water and Wastewater Service Provision in the Greater Sydney Region - Draft Report*, September 2005, p 1.

34 AGL's submission to IPART, *Investigation into Water and Wastewater Service Provision in the Greater Sydney Region - Draft Report*, September 2005, p 4.

2.2.2 Expanding Sydney Water's current competitive procurement program

Sydney Water estimates that private sector competitive tenders currently account for approximately 35 per cent of its total operating expenditure and 90 per cent of its capital expenditure.[35] The activities carried out under contractual arrangements include construction, some maintenance, bill issuing and collection, printing, plant hire, fleet management, meter reading, the operation of some smaller sewage treatment plants (STPs) and sewerage systems, and the operation of water filtration plants (under Build Own Operate contracts). It also estimates that its current use of competitive procurement has contributed to a 37 per cent decrease in its operating costs since 1994.[36]

The experience of water utilities in other jurisdictions, such as Melbourne, suggest that there may be potential for Sydney Water to achieve further benefits by extending the scope of its current competitive procurement program, to an extent determined by the relative efficiency of in-house and competitive provision. For example, some areas of field maintenance, customer interface and corporate support services (eg, information technology services) could potentially be contracted out to achieve efficiency savings.

AGL supports the continuation and expansion of Sydney Water's program of outsourcing to the private sector in a range of areas including:

- construction and rehabilitation of Sydney Water's distribution, recycled water and sewerage networks
- restorations after planned and scheduled maintenance
- metering and meter reading
- operation of smaller treatment plants and reticulation systems
- maintenance of electrical and mechanical systems
- scheduled and emergency civil maintenance
- call centres and customer billing
- operation of maintenance networks
- asset management.[37]

Increasing the scope of competitive procurement could produce a level of competition among bidders that would further minimise Sydney Water's costs and expose it to a wider range of technological options. Private providers may be able to provide services cheaper than a water utility for a range of reasons. For example, independent providers of specific services may reap economies of scale/scope beyond the reach of individual water authorities. Specialist companies may also have lower overhead costs, and tend to adopt new technologies faster than large utilities. For reasons such as these, there is a growing trend amongst water utilities toward expanding the scope for competitive procurement.[38]

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35 Sydney Water Corporation submission to IPART, *Investigation into Water and Wastewater Service Provision in the Greater Sydney Region – Issues Paper*, July 2005.

36 ibid.

37 AGL submission to IPART, *Investigation into Water and Wastewater Service Provision in the Greater Sydney Region*, June 2005.

38 Webb M & Ehrhardt D, "Improving Water Services through Competition", *Public Policy for the Private Sector*, Note No.164, December 1998.

Recommendation 4

That the Government require Sydney Water to consider using more innovative, outcomes-based competitive procurement in other areas of service delivery, and expanding the scope of its current competitive procurement program in general.

3 OPEN ACCESS TO INFRASTRUCTURE

As set out in the Draft Report, the Tribunal believes that a second step in increasing competition in Sydney's water and wastewater industry would be to introduce open access to infrastructure. Under open access, new entrants would be permitted to seek access to water infrastructure to inject potable water and transport it across the water network, competing in retail water services. They would also be permitted to seek access to wastewater infrastructure to compete to collect wastewater from customers, transport it across the network and withdraw it for treatment.

Access in this context differs from arrangements that fall under the banner of competitive sourcing (such as sewer mining, which is discussed in the previous chapter). Competitive sourcing for water entails a bulk water supplier selling a new water resource to Sydney Water, and Sydney Water then selling this water to end-customers. Access involves the transportation of potable water across Sydney Water's network, supported by a commercial relationship between the third party access seeker and retail customers, who pay water charges directly to the third party access seeker.

The Tribunal believes that access-based competition has the potential to improve the efficiency and effectiveness of service provision in Sydney's water and wastewater industry. In general, where it is feasible, competition can provide stronger incentives for efficiency and innovation than regulation. The introduction of competition usually means that utilities need to acquire new expertise and change their approach to planning service delivery and meeting customer needs (ie, their 'culture'). Open access competition in the gas and electricity industries in Australia and other countries has generally produced significant efficiency gains, and the water industry has similar characteristics to these industries.

In its Draft Report, the Tribunal suggested that, consistent with the approach taken in other industries and jurisdictions, choice of supplier should initially be limited to large customers only. The Government could then consider whether to extend open access competition to all customers, once experience has been gained and a greater understanding of the potential for competition has been reached. In its submission to the Draft Report, PIAC supported the staged introduction of access-based competition, initially to large customers rather than households, noting the limited experience with such an arrangement both in Australia and overseas.[39] Services Sydney argued that as approximately 80 per cent of Sydney Water's customers are "small" customers, access-based competition should extend to all retail customers.[40] Services Sydney also contends that limiting competition to large customers would considerably narrow the scope of the NCC's recommendation to declare access to Sydney Water's wastewater infrastructure.

The Tribunal has further considered this issue and is of the view that, on balance, access-based competition should be available for all customers. On this basis, the Tribunal envisages that a new entrant's business proposal would cover all costs associated with the proposed scheme, including those retail costs associated with introducing competition. Such retail costs would not be spread across Sydney Water's asset base, recovered from Sydney Water's remaining customers or be the subject of a price determination by the Tribunal.

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39 See PIAC submission on *Investigation into Water and Wastewater Services Provision in the Greater Sydney Region – Draft Report*, October 2005 p 2.

40 See Services Sydney Pty Ltd, *Investigation into Water and Wastewater Service Provision in the Greater Sydney Region - Draft Report*, October 2005, p 2.

In its Draft Report, the Tribunal recommended that to best support the Government's objective to increase the efficiency, effectiveness and sustainability of water and wastewater service delivery, the access regime should be:

- State-based, to allow the integration of regulatory issues and Government policy matters, which is particularly important given the public health issues associated with water supply, and appropriate as the provision of urban water is highly location specific and there will never be a national market for urban water.
- Based on a negotiate-arbitrate model, with a future review point established to assess the adequacy of the access arrangements and the need for more detailed regulation. This approach allows open access to be introduced in a flexible way, consistent with the Tribunal's recommendation that an adaptive management approach be taken to regulatory change and reform of the water and wastewater industry in general.

The Tribunal continues to support these recommendations, for the reasons set out below.

The Draft Report also set out consideration of a range of issues that the Tribunal recommends should determine other key features of the access framework. These policy matters and other implementation issues are also discussed below.

3.1 A state-based access regime

There are at present essentially two main options for establishing an open access regime for Sydney's water and wastewater infrastructure. The first is to rely on the current Commonwealth access regime under the *Trade Practices Act 1974* (the Trade Practices Act). Under this option, two federal institutions - the National Competition Council (NCC) and the Australian Competition and Consumer Commission (ACCC) - would each play a role, while the Tribunal would continue to be responsible for regulating other aspects of the water and wastewater industry (including prices, service standards, operating licences etc). The second option is to establish an effective state-based regime[41] in which a regulator would regulate access, as well as other aspects of the industry.

It is the Tribunal's view that establishing a state-based access regime would be preferable to relying on the current Commonwealth regime. The Tribunal believes that the most significant advantage of a state-based access regime is that it would facilitate the most effective and efficient co-ordination of regulatory issues and State Government policy matters, including public health and safety, planning, economic and environmental matters (for example, through the integration of licence conditions). This would improve accountability for the cohesiveness of the overarching regulatory regime, which is particularly important given that water is an essential service. Reliance on the Commonwealth regime would mean that there is always more than one regulatory regime for urban water.

A state-based regime would provide for a single, experienced regulator for all water and wastewater prices, terms and conditions, and would promote consistent regulatory decisions and regulatory efficiency, by avoiding duplication of resources and expertise within the Tribunal and the ACCC. For example, as no urban water infrastructure is currently declared

41 The Competition Principles Agreement sets out principles that should be incorporated in a State or Territory access regime.

under the Trade Practices Act, the ACCC has limited experience in regulating water industries. As the Tribunal has extensive water industry regulatory experience, establishing a state-based regime could leverage the regulatory proficiency currently available, and provide for the future development and concentration of expertise within a single agency.

National regulatory regimes are appropriate where there are national markets. By definition, there will never be a national market for *urban* water. Under a state-based access regime, arrangements in different jurisdictions can be tailored to reflect location specific issues. For example, the Sydney context calls for a 'bespoke' approach that recognises the particular characteristics and concerns driving water reform in Sydney – that is, a focus on developing new supply sources and efficient water usage, compared with more traditional reform objectives of improved productive efficiency, increased customer choice, lower prices and better service standards.

A state-based access regime could be designed to provide for a more simplified, streamlined access and appeal process that is more appropriate to the current industry context. It could promote process and administrative efficiency, for example by reducing the steps associated with declaration and/or stipulating at the outset certain assets that are deemed to meet declaration criteria. The Commonwealth regime applies a particular declaration process; a state-based regime could include a process for identifying infrastructure that is subject to access in a way that is designed to best meet the particular circumstances. In addition, a state-based regime may not require as extensive legislative support as the Commonwealth regime, and the process for extending, varying or revoking a declaration could be more streamlined. The Commonwealth regime relies on the NCC making a declaration to a Minister, who must decide to accept or reject the recommendation. A state regime need not use the NCC or include the second tier of Ministerial involvement. Finally, a state regime would not be subject to the constitutional limitations of the Commonwealth. For example, the Commonwealth regime relies heavily on the corporations' power, so that the service provider or third party must be a corporation.

3.2 A negotiate-arbitrate model

As set out on the Draft Report, the Tribunal believes that the model for providing access to monopoly infrastructure assets needs to be responsive to the level of demand for access and reflect the level of knowledge about the best possible access arrangements and the potential market power of access providers. In relation to Sydney's water and wastewater infrastructure, the current level of demand for access is unclear, and there is little knowledge about the optimal content and structure of the access framework. There is also a lack of direct precedents on which to draw to develop detailed access arrangements, because little competitive reform has occurred in the water and wastewater industry in any jurisdiction.

Although it would be possible to develop a detailed regulatory regime for open access at the outset, this would require significant funds and resources. It may be imprudent to expend too much public effort – or lock in too much detail – until there is more certainty about the net benefits of and demand for access. Until the Government is confident of the areas in which competition will emerge, it may be better to internalise the transaction costs involved in enabling access to the parties that will benefit most from this access. This suggests that the most appropriate model is a negotiate-arbitrate model, under which access seekers who believe they can benefit from obtaining access can do so on a commercial basis, with a regulator to arbitrate access disputes and provide guidance on key issues as they emerge.

The Tribunal recognises that the vertically integrated structure of Sydney Water raises the issue of market power and the role of regulation. Where an access provider has significant market power, specific regulation of access terms, conditions and pricing is likely to be more effective than a negotiate-arbitrate regime. However, given the issues outlined above, the Tribunal believes a negotiate-arbitrate model should be established,[42] and that continued regulation of Sydney Water's retail prices (as recommended in Chapter 7) will assist in preventing the exploitation of monopoly power. At the same time, a future review point should be established, so that the adequacy of the access arrangements and the need for more detailed regulation can be assessed when more knowledge and experience has been gained.

3.3 Implementing open access to infrastructure

Open access to water and wastewater infrastructure can be implemented by designing and establishing an initial access framework. Steps to remove impediments to new entrants participating in the water industry and ensure the ongoing protection of customers and the broader public interest will support the access regime. The policy decisions needed to implement access and the governance and regulatory arrangements required to support it are discussed below.

3.3.1 Initial access framework

The initial access framework can be reasonably simple, setting out the Government's position on the scope of the access regime, who is permitted to seek access and to what infrastructure or services, the role of the regulator and the information access providers are required to publish.

Scope of the access regime

The Government needs to consider whether an access regime should be developed only with the greater Sydney metropolitan area in mind, or for potential application to the whole of NSW. The Tribunal sees merit in developing a framework that is capable of general state-wide application, provided the regime includes appropriate exception or exemption mechanisms to accommodate possible future developments.

It is likely that there will be areas where government policy supports exceptions or exemptions from the framework when developed – such as to grant an access holiday for a new franchise in order to support an innovative project that otherwise may not proceed. As set out in the Draft Report, precedents for exceptions exist in other network industries. For example, since the national gas access code has been implemented, the Productivity Commission has expressed support for access holidays for new pipeline developments. There has also been national debate about greenfield pipeline developments, statutory amendments in Victoria to allow new exclusive distribution and retail area licences, and exclusive franchises granted in Tasmania to help establish a new gas reticulation system.

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42 Services Sydney's submission to the Draft Report notes the experience and legislated rights of the ACCC regarding commercial arbitration (see Services Sydney Pty Ltd, Investigation into Water and Wastewater Service Provision in the Greater Sydney Region – Comments on the IPART Draft Report, October 2005, p 1). The Tribunal notes that it has comparable expertise and responsibilities in the context of rail access in NSW.

Access seekers

Consideration should also be given to the question of who can seek access to infrastructure. One option is for open access to be available to any person. This is the case in the current Commonwealth access regime, where the declaration process under the Trade Practices Act establishes a right for any party to apply to the NCC for declaration of a service. If a service is declared and negotiations with the access provider fail, declaration also gives an access seeker the right to seek binding arbitration by the ACCC.

Another option is for open access to be available specifically to market participants. This is the case in the electricity industry, where market participants (generators, customers and network service providers) must be registered, through a formal process strictly defined in the market rules, before they are able to participate in the National Electricity Market (NEM). One feature of this option is the registration of 'intending participants'. These parties must reasonably satisfy the market registrar (in the case of the NEM, the National Electricity Market Management Company) that they intend to perform an activity that would entitle them to be a registered participant. This reflects the fact that new entrants may require certainty regarding access and access to information to help assess the economics of a particular proposal, long before they establish an entity (such as a licensed retailer) that may be eligible to seek access.

Another question related to *who should be entitled to access* is w*hen should rights to access be considered?* Innovation may be stifled if potential service providers cannot first establish eligibility to access infrastructure. In the NSW context, a logical sequencing of decisions may be:

- to first secure an 'in principle' decision on access
- then undertake detailed engineering, feasibility, design studies
- then do detailed planning and environmental analysis, seek approvals, etc.

To facilitate entry into the industry the Tribunal suggests that the regulatory mechanism enabling access should be flexible enough to allow any person to seek access, so long as such applications are not spurious.

Infrastructure or services subject to access

The Government needs to decide who should determine whether particular infrastructure or services should be subject to open access, and on what basis. In principle, the services provided by water and wastewater infrastructure that exhibit natural monopoly characteristics, given their size and location, could be subject to open access. Potential infrastructure includes treatment plants, transportation assets, dams, reservoirs, natural aquifers and storage facilities. Services or infrastructure may be stipulated at the outset (together with a mechanism for later adding or removing assets from the regime).[43] This could entail a relatively simple arrangement, such as the NSW rail access regime under which access is available to all rail network operated by the Rail Infrastructure Corporation.[44]

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43 Alternatively, services or infrastructure could be stipulated as excluded from open access (with all other services or infrastructure being subject to open access).

44 Similarly, under the *Australasia Railway (Third Party Access Act) 1999* in South Australia, third party access is available to all track, signalling, control and communications facilities, and other facilities as may be prescribed.

Another option is a more detailed arrangement, such as the national gas access regime, which uses the concept of 'coverage' and 'covered pipelines' supported by access undertakings submitted by access providers.[45] Alternatively, rights of access may be determined on a case-by-case basis, by being assessed against known criteria. This is the case with the declaration process under Part IIIA of the Trade Practices Act.

The Tribunal proposes that access to particular services or infrastructure be granted on application, with the state regulator (ie, the Tribunal) responsible for making this assessment.[46] It believes that, unless there is sound reason to diverge, the basis for granting access should draw on the tests in the Trade Practices Act and the Competition Principles Agreement[47] – that is, access should apply to services provided by means of significant infrastructure facilities where:

- it would be uneconomical for anyone to develop another facility
- access (or increased access) to the service would promote competition in at least one market, other than the market for the service
- that access can be provided without undue risk to human health or safety
- that access would not be contrary to the public interest.

The Tribunal also suggests that the Government examine whether there is scope and merit in identifying any Government-owned assets that meet these criteria, and deem the services provided by such infrastructure subject to open access on the introduction of an open access regime.

Role of the regulator

Judgement also needs to be made on the role of the regulator. In administering an access regime, the range of decisions required of a regulator may include:

- Determining which assets should be subject to open access.
- Administering those general regulatory obligations that will apply to new entrants (such as operating licence obligations).
- Setting access prices, terms and conditions in arbitrating access disputes.

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45 If a natural gas network is 'covered' under the National Third Party Access Code for Natural gas Pipeline Systems, the owner/operator of the network must submit, and have approved by the regulator, an access arrangement that sets out the terms and conditions (including tariffs) under which existing and prospective users can obtain access to services provided by its network.

46 In its submission to the Draft Report, AGL asserted that it would be inappropriate for the access regulator to determine which assets should be subject to access, and that consideration should be given to using the NCC to make decisions in this regard (see AGL submission to IPART's Draft Report, *Investigation into Water and Wastewater Service Provision in the Greater Sydney Region,* September 2005, pp 6-7). The Tribunal disagrees with AGL's assertion, and notes that it would be bound by the same regulatory principles as a federal regulator. Alternatively, AGL suggests that the Tribunal could make recommendations to the Government, with the relevant Minister being responsible for making the final decision. Such an approach is consistent with the Hilmer Report on National Competition Policy, which recommended that an independent body should make recommendations regarding access to infrastructure, but that the final decision should rest with the relevant Minister, given the potential public interest issues associated with access to major infrastructure assets. The Tribunal notes that this is an option, and suggests that ultimately it is a policy decision for Government.

47 The Tribunal notes that access regimes certified as 'effective' by the NCC are also expected to incorporate the principles (a) to (p) set out in clause 6(4) of the Competition Principles Agreement.

- Monitoring the efficacy of the regime and advising Government on future regulatory needs.
- If the need arises, overseeing development of more detailed regulation (eg, an access code).

In addition, the regulator may issue guidelines associated with access regulation. For example, such regulatory guidelines may set out the regulator's interpretation of the relevant infrastructure asset tests that will be used in deciding whether or not assets should be subject to access. They may also set out the pricing principles that will be applied in calculating access prices. In all circumstances, the regulator would have access to the information required from access providers to undertake its regulatory responsibilities.

In its Draft Report, the Tribunal suggested that access negotiations be constrained to mandate use of the Efficient Component Pricing Rule (ECPR) for pricing access to infrastructure.[48] The Tribunal further suggested it might then have a role in auditing access agreements (to confirm that parties are using ECPR) and the power to override access agreements (if parties are found to be using an access price inconsistent with ECPR). The concept of such a statutory contract override mechanism has precedent in the England and Wales water network access regime. [49]

In its submission on the Draft Report, AGL suggested that such powers were unnecessary under a negotiate-arbitrate regime.[50] The Tribunal has further considered the need to constrain negotiations in this way and has decided, on balance, to remove this recommendation, but that it should specify in advance the pricing principles it will adopt if it is called to arbitrate an access dispute.

The Tribunal therefore recommends that ECPR will be the methodology it uses to price access under arbitration (see chapter 4). The Tribunal would have no role in auditing access agreements, and no power to override such agreements.

Publication of information by the access provider

Chapter 6 sets out the general need for certain information to be readily accessible in order to encourage competition and innovation. In the specific case of open access, indicative prices would assist access seekers in evaluating the viability of different projects. There is a precedent for this in the gas access regime, which establishes approved 'reference tariffs' for services 'likely to be required by access seekers'. Reference tariffs are not binding in their own right, but provide the basis around which negotiation takes place.

The Tribunal recommends that, as a first step, Sydney Water be required to prepare and publish a policy regarding access. The policy would set out Sydney Water's objectives in providing open access, and the key elements of its approach in meeting these objectives. Objectives could include facilitating a dynamic market for water and wastewater services. The elements of the approach must include:

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48 As set out in chapter 4, the Tribunal supports the use of ECPR on the basis of retail pricing outcomes, ie ECPR allows the existing postage stamp pricing arrangements to be maintained.

49 See Sections 66D(7) and 66D(8) of Schedule 4 of the *Water Act 2003* (Schedule 4 makes provision for licensing and access and introduces sections 17A-17R and sections 66A-66L to the *Water Industry Act 1991*).

50 AGL submission, *Investigation into Water and Wastewater Service Provision in the Greater Sydney Region - Draft Report*, September 2005, p 7.

- open access to all parties seeking to transport water and/or wastewater
- non-discriminatory offering of access prices, terms and conditions
- services provided to meet the needs of new entrants
- accessible information on potential services offered
- calculation of access prices according to the Efficient Component Pricing Rule (ECPR).

The policy could be accompanied by the publication of indicative access prices. Other aspects of the access policy (eg, particular terms and conditions of access) may evolve in response to consultation with access seekers and potential access seekers.

3.3.2 Supporting governance and regulation

Implementing open access requires that any existing legal impediments to third-party access to infrastructure and participation in water and wastewater services be identified and removed. It also requires that the legal and regulatory framework place appropriate obligations on incumbents and new entrants, particularly in relation to issues such as water quality and public health and security of supply.

Removing legislative impediments

In its Draft Report, the Tribunal noted that there exist a number of statutory impediments to private sector involvement in the water industry. Specific issues relevant to third party access and retail competition are that statutory deemed contracts (and associated payment obligations) between Sydney water and land owners under the *Sydney Water Act 1994* continue to apply regardless of whether the land owner enters into an agreement for supply of services from a private sector entity. In addition, under the *Water Management Act 2000*, anyone who is supplied water by a private sector entity must have a 'water use approval' in place.

To facilitate open access, statutory impediments to third-party participation in the provision of water and wastewater services (and associated infrastructure) should be identified and, where warranted, removed. This issue is discussed further in Chapter 6.

Applying appropriate obligations

As set out in Chapter 7, the introduction of competition in the water and wastewater industry requires changes to the legal, regulatory and policy framework, to ensure the framework provides adequate and appropriate protection of the broader public interest.

The Tribunal has identified a number of areas where additional protections may be warranted in the case of open access to infrastructure. These areas include:

- ensuring security of supply
- ensuring water quality
- managing environmental impacts
- developing, maintaining and extending water and sewerage services
- addressing the potential implications for customer contracts

- allocating responsibilities for coordinating and managing emergencies and matters of national security.

As a minimum, a licensing regime for new entrants with appropriate terms and conditions, and monitoring and compliance mechanisms would need to be established. Risk allocation and management of matters arising from the common carriage of water and wastewater would also need to be defined and addressed.

The Tribunal's proposed reform implementation program is set out in chapter 8. The Tribunal has undertaken preliminary work identifying the items that access arrangements may cover. These include technical and operational issues, requirements regarding data exchange, and legal and general items. Specific issues associated with access to Sydney Water's water and wastewater networks have also been identified. These issues are discussed in Appendix C.

3.4 The Tribunal's recommendations

Recommendation 5

That the Government establish a state-based access regime for water and wastewater infrastructure, and that the regime is initially based on a 'negotiate and arbitrate' model.

Recommendation 6

That the Government incorporate the Tribunal's recommended framework in the access regime. This framework comprises:

1. *A regulatory mechanism that enables:*
   - (a) *designated people:*
   - (b) *to seek access to all water and wastewater infrastructure:*
     - *that may be specified at the inception of the access regime, and/or*
     - *that meets certain criteria (based on the current Trade Practices Act 1974 tests)*
   - (c) *Contracting freedom for the access seeker and asset owner, provided system integrity, operation, health, etc not jeopardised*
   - (d) *The access seeker and asset owner subject to arbitration by the Tribunal if agreement cannot be reached*
   - (e) *regulatory guidelines or other instrument to be prepared by the Tribunal that:*
     - *set out its interpretation of relevant infrastructure asset tests that will be used in deciding whether or not assets should be subject to access*
     - *establish relevant pricing principles that should be applied in calculating access prices in arbitration*
2. *A requirement for Sydney Water (and possibly any other access provider) to publish an access policy and indicative access prices.*
3. *A future review point for the Tribunal to assess adequacy of access arrangements/regulation, and inform Government of findings.*

4 PRICING INFRASTRUCTURE ACCESS

In its Draft Report, the Tribunal recognised that the success of introducing open access to infrastructure in creating a more competitive market for water and wastewater services would depend largely on how access is priced. If too high an access charge is set, efficient new entrants will not be able to enter the market. If the charge is too low, the access providers will not receive adequate compensation for new entrants' use of the network, which might reduce their incentive to invest in the network. Moreover, low access charges might encourage inefficient entry, which would raise the total costs of the industry.

The Tribunal examined in detail two potential approaches to pricing infrastructure access:

- an average cost allocation, or building block, methodology
- the Efficient Component Pricing Rule (ECPR).

Based on its analysis, the Tribunal's preferred approach was the ECPR methodology. This methodology sets the highest access charge consistent with facilitating efficient access. (However, is should be noted that continuing retail price regulation will prevent Sydney Water as a whole from earning excessive profits.) It is the approach adopted for calculating access charges in the England and Wales water industry. The Tribunal's preference for ECPR was driven largely by the fact that it facilitates retention of the current postage-stamp pricing arrangements. Another advantage was that it can be implemented in the absence of information about the unbundled costs of Sydney Water's services.

The Tribunal continues to support the use of ECPR, having found no evidence since publication of the Draft Report to lead to its rejection.[51] As set out in chapter 3, the Tribunal no longer recommends that access negotiations be constrained by mandating the use of ECPR for pricing access to infrastructure. However, the Tribunal recommends that it use an ECPR approach to access pricing if called upon to arbitrate an access dispute.

The following sections provide an overview of:

- The Tribunal's approach to assessing the three methodologies.
- Its assessment of each methodology.
- Its overall conclusions.

In addition, the Tribunal has considered suggestions that the wastewater access price should reflect the cost of avoided potable water purchases by Sydney Water. The Tribunal does not agree with this assertion, for the reasons outlined below.

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[51] Sydney Water supports the use of ECPR for pricing infrastructure access (see Sydney Water Corporation's submission to IPART, *Investigation into Water and Wastewater Service Provision in the Greater Sydney Region - Draft Report*, September 2005, p 2). While Services Sydney objects to ECPR (see Services Sydney Pty Ltd, *Investigation into Water and Wastewater Service Provision in the Greater Sydney Region – Draft Report*, October 2005, p 2), it did not provide the rationale behind its rejection of this methodology in this submission.

4.1 Tribunal's approach to assessing the methodologies

In assessing the methodologies, the Tribunal assumed there will be a common carriage framework for access (see Appendix D for more detail). Usually, two access charges are levied under such a framework: one charge for injecting water or wastewater into the network, and another for off-taking water or wastewater from the network. In almost all cases, the injection charge (referred to as a 'connection charge' in electricity and gas distribution) recovers the incremental cost of accepting the injection at the specific geographic location. The off-take charge (referred to as a 'use of system' charge) recovers the average cost of building and maintaining the network (ie, the access provider's sunk costs). Electricity generators and gas suppliers generally treat the injection charge like any other cost of doing business and bundle it into their wholesale price (along with fuel, operating costs, etc). The Tribunal can see no reason why new entrant suppliers in the water industry would not take the same approach.

For this reason, the Tribunal focused its analysis on pricing the off-take charge. Because there is limited international experience in applying the access pricing methodologies in the water industry, it assessed them by developing a number of scenarios under which new entrants might off-take water or wastewater from Sydney Water's network for the purpose of supplying retail services to one or more existing customers. It then calculated the charge for off-takes under each scenario, using each methodology.[52]

These scenarios, which are set out in detail in Appendix E, use the prices set out in the Tribunal's determination for metropolitan water prices.[53] For water supply, the average retail tariff over the price determination period (1 October 2005 to 30 June 2008) is $1.51/kL for residential customers and $1.25/kL for non-residential customers (fixed charge plus usage charge). The average retail tariff for wastewater services over the period is $1.64/kL. In addition, the scenarios assume a Long Run Marginal Cost (LRMC) of water supply in greater Sydney of $1.20/kL. As set out in the Tribunal's determination of metropolitan water prices,[54] this is the lower bound of the current estimated range for the LRMC of water supply of $1.20 to $1.50 per kL, based on the Government's Metropolitan Water Plan. All other figures in the scenarios have been assumed by the Tribunal. In addition, all figures are expressed on a per annum basis and the scenarios calculate an average annualised access charge (per kL) for the determination period.

The Tribunal notes that the purpose of the scenarios is to illustrate the workings of the different access pricing methodologies and, in particular, the implications for the cash flows of new entrants – they cannot be taken to show indicative access prices.

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52 Charges for new off-takes are considered in the formulation of the Tribunal's overall conclusion (see section 4.4).

53 IPART, *Sydney Water Corporation, Hunter Water Corporation, Sydney Catchment Authority – Prices of Water Supply, Wastewater and Stormwater Services – Final Report*, September 2005.

54 Ibid, p 18.

4.2 Assessment of average cost allocation, or building block method

The building block method involves calculating the average revenue that the access provider needs to earn in order to recover its capital and operating costs and an appropriate return on assets, and using this revenue requirement as the basis for determining average access charges.

4.2.1 Building block access charges for the water network

The Tribunal's analysis suggests that if this method was used to price access for off-takes, the resulting charge is likely to be too high to allow efficient new entrants to compete with Sydney Water's water supply tariffs. The reason for this is that under the building block method, the off-take charge would be set so that it recovers the new entrant's 'share' of the average costs of Sydney Water's whole water supply network.[55] Therefore, the new entrant would need to set its own retail prices to recover this 'share' plus its own cost of supply. Given that its cost of supply is likely to be significantly higher than Sydney Water's average cost of water purchases, these prices are likely to be much higher than Sydney Water's retail tariffs. The following (highly simplified) example illustrates this point.

The Tribunal's price determination set the price of water supply for Sydney Water's residential customers at \$1.51/kL. Sydney Water's average cost of water supply (bulk water purchases and treatment) is around \$0.50/kL, so around \$1.00/kL goes towards recovering the average costs of the whole network. If an efficient new entrant supplies water from a new water source, the average cost of this water is not likely to \$0.50/kL – it can be expected to be between \$1.20/kL and \$1.50/kL (ie, within the current estimate of the LRMC of water supply). So, if the new entrant must also contribute around \$1.00/kL for average network costs through a building-block-based access charge, its total cost of supply would be at least \$2.20/kL (ie, almost 50 per cent higher than the Sydney Water tariff of \$1.51/kL). In this instance, it is clearly not possible for an efficient new entrant to compete with Sydney Water's retail tariffs where access charges are based on average network costs.

The Tribunal's scenario 4 also illustrates this point (see Table 4.1 below, and Appendix E). This scenario looks at a large desalination plant producing potable water for supply to residential customers. The Tribunal calculates that using the building block method, the access charge would be \$0.57/kL. This means that the plant would need to supply water at a cost of \$0.94/kL to match Sydney Water's retail tariff of \$1.51/kL. Given that this cost is significantly less than the LRMC of water supply, it seems that a building-block-based access charge would make it difficult for an efficient new entrant to compete with Sydney Water.

[55] The new entrant would be allocated a portion of the average network costs that is commensurate with the portion of the network that it uses.

Table 4.1 Scenario 4: New entrant cash flows – access to water system for large desalination plant producing potable water for supply to residential customers

	Building block	
Water Supply tariff	$1.51/kL	Customer pays new entrant
less Infrastructure Access Charge	$0.57/kL	New entrant pays Sydney Water
Surplus before customer service, water and treatment costs	$0.94/kL	Retained by new entrant

4.2.2 Building block access charges for the wastewater network

The Tribunal also considered scenarios where the new entrant wanted to provide wastewater services. As for water services, the new entrant's ability to compete under a building-block-based access charge will depend on the relationship between average and marginal costs. Scenarios 1 and 2 look at new entrants that access Sydney Water's wastewater system in an ocean outfall catchment area and a tertiary treatment plant catchment area. Under these scenarios, the Tribunal calculates that using the building block method, the access charges would be $1.20/kL and $1.35/kL respectively. Given Sydney Water's wastewater charge of $1.64, the building block approach may provide some 'headroom' for a new entrant to be competitive, particularly if it on-sold the recycled water. The headroom under scenario 1 would be $0.44/kL; under scenario 2 it would be $0.29/kL.

Table 4.2 Scenario 1: New entrant cash flows - access to wastewater system in an ocean outfall catchment area

	Building block	
Wastewater charge	$1.64/kL	Customer pays new entrant
less Infrastructure Access Charge	$1.20/kL	New entrant pays Sydney Water
Surplus before billing and collection costs, treatment, disposal and/or re-sale	$0.44/kL	Retained by new entrant

Table 4.3 Scenario 2: New entrant cash flows - access to wastewater system in a tertiary treatment plant catchment area

	Building block	
Wastewater charge	$1.64/kL	Customer pays new entrant
less Infrastructure Access Charge	$1.35/kL	New entrant pays Sydney Water
Surplus before billing and collection costs, treatment, disposal and/or re-sale	$0.29/kL	Retained by new entrant

4.2.3 Retail price implications

Retail water and wastewater tariffs (for most customers) in Sydney Water's supply area do not vary with location – that is, for each class of customer, retail prices are geographically uniform (this is known as 'postage stamp' pricing). This raises issues about whether infrastructure access charges should be geographically uniform or allowed to vary with location. Moreover, if geographically uniform access charges are considered desirable, an issue arises as to how to prevent location specific access charges under a 'negotiate-arbitrate' access regime.

A building block approach could be used to set either locational or geographically uniform access charges. At one end of the spectrum, the building block approach could be based on a hypothetical optimal supply configuration specific to a particular customer for whom access charges are required. Under this approach, the access price for customers close to supply sources would be much lower than remote customers. This is the approach used to calculate access charges for NSW's largest electricity distribution customers. An alternative building block approach is to allocate a geographically averaged cost of access. This is the approach used to calculate access charges for residential and most commercial electricity customers in Sydney. This approach would yield geographically uniform access charges.

Given the current uniform retail tariffs, access charges that vary with location would mean that profit opportunities for new entrants also vary with location. That is, new entrant suppliers would be attracted to ('cherry-pick') low access charge customers.[56] The building block approach is an average cost allocation, and low access charges may be unrelated to the economic costs of providing access (or indeed the economic costs of the network). There is no economic rationale for creating an access regime with incentives to supply only customers close to supply sources. The Tribunal considers that it is inappropriate to develop a geographically varying access charge regime while retail tariffs remain geographically uniform.

As set out above, given the current relationship between Sydney Water's average cost of water purchases and the marginal cost of water supply (ie, the LRMC of water supply), the Tribunal considers that an access price based on the building block methodology is unlikely to facilitate access to the water supply system for new entrants with new water sources. This would be the case even with a geographically uniform access price.

In the case of wastewater, there is a significant difference between the costs of providing services in the West compared to the East (driven largely by differences in treatment technology and population density). Average costs per property for wastewater services in the West are around 1.5 times those in the East. Even with a geographically uniform building block access price, new entrants would have an incentive to cherry-pick customers in the East, who are significantly cheaper to service than customers in the West.

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56 This would have impacts on the incumbent service provider, who may be left with an 'average' retail price to cover the costs of the more expensive customers, with subsequent implications for the Government (as shareholder) and/or customers.

4.3 Assessment of the Efficient Component Pricing Rule method

Use of the Efficient Component Pricing Rule (ECPR) involves setting access charges by taking Sydney Water's retail tariff, adding the incremental costs it will incur by providing access and subtracting the costs it will avoid by providing access ('avoided costs').

4.3.1 ECPR-based access charges for the water network

Using the ECPR method to set charges for access to Sydney's water supply system will generally result in a lower charge than using the building block method. This is because the costs that Sydney Water will avoid by not having to purchase the water that the new entrant will supply (ie, largely the LRMC of water supply of $1.20/kL) are higher than the average cost of water supply (0.50/kL). These avoided costs are also high in comparison to average retail tariffs ($1.25 for non-residential customers and $1.51/kL for residential customers).

Scenarios 3 and 4 look at large desalination plants that produce potable water to supply non-residential customers and residential customers respectively. These scenarios show that, because the LRMC of water supply is similar to the retail tariff, ECPR-based access charges for the potable water delivery network are likely to be very low (see Tables 4.4 and 4.5, and Appendix E).

Table 4.4 Scenario 3: New entrant cash flows – access to water system for large desalination plant producing potable water for supply to non-residential customers

	ECPR	
Water Supply charge	$1.25/kL	Customer pays new entrant
less Infrastructure Access Charge	$0.01/kL	New entrant pays Sydney Water
Surplus before customer service, water and treatment costs	$1.24/kL	Retained by new entrant

Table 4.5 Scenario 4: New entrant cash flows – access to water system for large desalination plant producing potable water for supply to residential customers

	ECPR	
Water Supply tariff	$1.51/kL	Customer pays new entrant
less Infrastructure Access Charge	$0.25/kL	New entrant pays Sydney Water
Surplus before customer service, water and treatment costs	$1.26/kL	Retained by new entrant

4.3.2 ECPR-based access charges for the wastewater network

Using the ECPR method to set charges for access to Sydney's waste water supply system is likely to result in high charges. Scenario 1 shows that the ECPR-based access charge for a new entrant accessing the wastewater system in an ocean outfall catchment area would be almost as high as Sydney Water's wastewater charge (see Table 4.6 and Appendix E), largely because the avoided costs are very low. Scenario 2 shows that the ECPR-based access charge would also be high for a new entrant accessing the wastewater system in an inland tertiary treatment catchment area (see Table 4.7 and Appendix E). The main reason is that the avoided capital costs of the treatment plant would only be around $0.07/kL to $0.34/kL.

Thus, the access charge under ECPR remains a high proportion of the retail wastewater tariff, even in inland parts of Sydney.

Under ECPR, a new entrant business based on treating and reselling wastewater might expect to obtain its raw material without charge, but it should not expect to obtain significant revenue from disposal of customers' waste – its business case would rely on selling recycled water for more than its processing cost.

Table 4.6 Scenario 1: New entrant cash flows - access to wastewater system in an ocean outfall catchment area

	ECPR	
Wastewater charge	$1.64/kL	Customer pays new entrant
less Infrastructure Access Charge	$1.62/kL	New entrant pays Sydney Water
Surplus before billing and collection costs, treatment, disposal and/or re-sale	$0.02/kL	Retained by new entrant

Table 4.7 Scenario 2: New entrant cash flows - access to wastewater system in a tertiary treatment plant catchment area

	ECPR ($14m avoided capex)	ECPR ($65m avoided capex)	
Wastewater charge	$1.64/kL	$1.64/kL	Customer pays new entrant
less Infrastructure Access Charge	$1.38/kL	$1.11/kL	New entrant pays Sydney Water
Surplus before billing and collection costs, treatment, disposal and/or re-sale	$0.26/kL	$0.53/kL	Retained by new entrant

4.3.3 Retail price implications

Access prices based on ECPR allow the 'postage-stamp' approach to retail pricing to be preserved, as they allow the retention of existing cross-subsidies, the current allocation of sunk costs, margin and risk, and the cost recovery or equity decisions associated with uniform prices. There are no retail pricing implications for customers retained by the incumbent, if the avoided cost calculation is accurate.

The ECPR methodology subtracts avoidable costs from the retail tariff. By far the most significant avoidable cost is the LRMC of water purchases. This cost would not be expected to vary geographically in an interconnected system and a geographically uniform retail tariff is likely to yield a geographically uniform access charge for the water system under the ECPR methodology. Thus, for the water network, it is possible to implement ECPR-based access charges, maintain the current geographically uniform retail tariff structure and avoid 'cherry-picking'.

There are effectively two wastewater 'systems' serving the greater Sydney area - one serviced by ocean outfalls, the other by inland tertiary treatment plants. Access charges under ECPR are likely to be different between the two, which reflects differences in future avoided capital and operating costs between the two systems.

4.4 Tribunal's conclusion on access pricing

After considering the advantages and disadvantages of each approach, the Tribunal prefers the ECPR methodology on the basis of retail pricing outcomes and administrative feasibility. It considers that using this approach to price access for off-takes will:

- facilitate efficient entry
- allow the current 'postage-stamp' approach to retail pricing to be maintained
- have a relatively low administrative burden – particularly if only a small amount of new entry is anticipated (avoiding the costs of calculating access prices for the entire network).[57]

As set out above, the building block method may exclude efficient new entrants in water services and provide an incentive for the cherry-picking of wastewater customers in the East. Pricing according to ECPR allows the maintenance of uniform retail prices and avoids the need to unwind cross-subsidies.

Sydney Water currently charges a 'bundled' retail price for water and wastewater services. That is, retail tariffs for water services include the cost of bulk water, treatment, transportation and retailing, and those for wastewater services include transportation, treatment, disposal and retailing. A building block approach would require the unbundling of Sydney Water's costs of service. ECPR can be implemented in the absence of the unbundling of these costs, avoiding the need to establish unbundled prices for the whole network. The Tribunal's preliminary analysis suggests that ECPR will facilitate access to Sydney's existing vertically integrated supply system in a way that is simple and inexpensive to administer. While some inputs into the ECPR methodology may involve complex calculations, the costs of implementation are unlikely to be prohibitive in the event of a low demand for access.

ECPR is sometimes criticised for generating high access prices (including retention of any monopoly rents). However, the Tribunal does not consider the potential retention of monopoly rents to be a significant problem in the context of calculating charges for access to water and wastewater infrastructure in the greater Sydney region, provided that the Tribunal also retains its current role of regulating retail tariffs.

Appendix F compares the access price approaches against a number of possible evaluation criteria.

Recommendation 7

That access to water and wastewater infrastructure be priced according to the Efficient Component Pricing Rule (ECPR).

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57 For new off-takes, outcomes under the ECPR methodology will be the same as for exiting off-takes. A building block approach would necessarily be the average cost of existing off-takes.

4.5 Rewarding potable water displacement

A further issue that has been raised in relation to access pricing is whether the wastewater access charge should include a component for Sydney Water's avoided costs of potable water purchases when a new entrant supplies recycled water to an existing Sydney Water customer. Consider a case whereby a new entrant:

- receives wastewater from customers
- transports wastewater to its treatment plant using Sydney Water's wastewater network
- treats the wastewater at its own plant and
- re-sells recycled water through its own delivery network.

4.5.1 The benefit to Sydney Water of reduced potable consumption

Sydney Water obtains a benefit from not having to purchase 1kL of water at an LRMC of water supply of $1.20/kL. However, the price that Sydney Water pays for that benefit is that it loses 1kL of sales at a marginal revenue of $1.20/kL or $1.48/kL, depending on whether the customer's marginal consumption is in Tier 1 or Tier 2.[58]

The following table (Table 4.8) shows that rather than there being a net benefit to Sydney Water from reduced potable consumption, there is in fact a net loss to Sydney Water (however the Tribunal notes that any negative financial outcome associated with lower than expected demand would be adjusted for at the next price determination). This simplified one-year analysis would show a zero net effect on Sydney Water if the reduced volume is Tier 1 consumption, as the Tier 1 price is set at the lower bound of the current estimate of the LRMC of water supply. This is an expected outcome of an efficient pricing structure for water where marginal price is set to match marginal cost.

Table 4.8 Cashflow associated with reduced potable consumption

Cashflow Component	Cost	Comment
SWC lost revenue	-$1.48/kL	Assumed that the marginal loss is from Tier 2 consumption.
SWC avoided costs	+$1.20/kL	LRMC of water purchases (lower bound)
SWC other avoided costs	$0.00/kL	Assumed nil for simplicity
SWC net position	-$0.28/kL	

As shown in the table below (Table 4.9), if Sydney Water was also required to pay to the new entrant an amount for the avoided cost of purchases, Sydney Water's cashflow would be even more negative. It would also provide incentives for inefficient access and/or recycling schemes, and is likely to require price rises for customers who remain with Sydney Water.

[58] Prices from 1 October 2005.

Table 4.9 Cashflow including payment to new entrant

Cashflow Component	Cost	Comment
SWC lost revenue	-$1.48/kL	Assumed that the marginal loss is from Tier 2 consumption.
SWC avoided costs	+$1.20/kL	LRMC of water purchases (lower bound)
SWC other avoided costs	$0.00/kL	Assumed nil for simplicity
SWC payment to new entrant	-$1.20/kL	
SWC net position	-$1.48/kL	

The Tribunal concludes that it is not appropriate for Sydney Water to pay another service provider for the avoided cost of potable purchases, if Sydney Water's water pricing structure is efficient and it is not recovering the revenue from sales of the substitute.

4.5.2 Attaching the incentive to the wastewater access charge

If an incentive for reducing potable consumption (an 'avoided potable consumption incentive') is desirable, the Tribunal believes that there are significant problems with including the incentive in the wastewater access charge. In particular:

- some scenarios for wastewater system access do not result in substitution of potable water, and
- some substitution of potable water does not involve wastewater access.

Consider a new entrant accessing the wastewater network but merely treating wastewater for disposal (in the sea or river system). Although accessing the wastewater network, this new entrant should not receive any 'avoided potable consumption incentive'. That is, the wastewater access charge would need to be dependent on the downstream use of the recycled wastewater.

It would also be possible for a new entrant to provide recycled water without requiring access to Sydney Water's wastewater network. If the new entrant bypassed the Sydney Water wastewater network (perhaps by winning a tender to provide wastewater services to a new area) or captured and stored stormwater run-off, then the new entrant would not receive the 'avoided potable consumption incentive'.

More generally, any number of third-party projects may result in potable water savings for Sydney Water. For example, a future car wash might use compressed air to dislodge dirt, thereby reducing potable water purchases. Equity requires that this project be as eligible for the 'avoided potable consumption incentive' as a wastewater recycling project.

4.5.3 Imperfect substitute

Even if such a mechanism was intentionally limited to providing incentives for wastewater recycling, it would be difficult to determine the level of substitution achieved. Recycled water is an imperfect substitute for potable water. That is, consumption of 1kL recycled water is not expected to result in a 1kL reduction in consumption of potable water. Issues include:

- elasticity, and
- different permitted uses.

If recycled water is priced below Sydney Water's potable water tariff, then for uses where recycled and potable water have identical utility, customers would be expected to use more recycled water than their historic potable water consumption. While water restrictions are in place, it is forbidden to use potable water for certain activities. Therefore any recycled water used for these activities does not displace potable water purchases. To determine the amount of potable substitution it would be necessary not just to know that the wastewater was recycled and re-sold, but also something about the end use of the recycled water. It would be more appropriate to attach any 'avoided potable consumption incentive' to an audit of actual potable water savings rather than being attached to recycled water use or to the wastewater access charge.

5 EFFECTIVE INDUSTRY STRUCTURE

In its Draft Report, the Tribunal discussed the costs and benefits of three alternative industry structures for Sydney's water and wastewater industry. These were:

- Disaggregating Sydney Water horizontally (ie, breaking it up to form two or more new water and wastewater businesses that would serve different geographical regions) in order to pursue productive efficiency gains.
- Disaggregating Sydney Water horizontally to address issues likely to be associated with a Growth Centres Commission water authority (such as insufficient economic scale and a higher cost structure).
- Disaggregating Sydney Water vertically (ie, separating some of its functions, particularly those that are potentially competitive, from those that are natural monopolies) to facilitate the development of open access competition.

Firstly, the Tribunal identified a number of opportunities for *potential* efficiency gains should Sydney Water be disaggregated horizontally. The sources of these potential gains are discussed below. In its Draft Report, the Tribunal noted that, as it cannot be reasonably confident that that the benefits would outweigh the costs, it considers there is insufficient justification to pursue this approach at this time. The Tribunal also noted its view that Sydney's most pressing problem at present is water scarcity, so it seems more appropriate to focus efforts and available resources on improving the dynamic efficiency of the industry, which can help to address this problem. While some respondents to the Draft Report noted their support for the assessment of the relative costs and benefits of alternative forms of disaggregation,[59] no stakeholders actively supported horizontal disaggregation *at this stage*. The Tribunal therefore retains the view that there is insufficient justification to pursue horizontal disaggregation on the grounds of productive efficiency gains at this time. However, the Tribunal recommends that work continue to examine the costs and benefits of disaggregation.

Secondly, the Tribunal considered the scope for disaggregating Sydney Water to address the issues likely to be associated with a Growth Centre's Commission water authority. As noted in its Draft Report, while the Tribunal believes that this approach could be feasible, careful consideration would have to be given to how to overcome issues associated with the significant differences in cost of service that exist between the growth centres areas and the rest of Sydney. Horizontal disaggregation on this basis would also be likely to require the sharing of major infrastructure assets. The Tribunal assessed several options for addressing these matters, which are set out in further detail below. The Tribunal found each option to have potentially significant disadvantages.

Thirdly, in regards to unbundling Sydney Water vertically to facilitate the development of open access competition, the Tribunal's Draft Report noted that this approach has been used successfully in other industries where open access has been introduced in conjunction with 'building block' access prices. However, the Tribunal noted its view that at this stage, it is unclear that the benefits of such structural reform would justify the costs, particularly as the level of demand for access is largely unknown. The Tribunal retains this view.

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59 See Sydney Water Corporation submission to IPART, *Investigation into Water and Wastewater Service Provision in the Greater Sydney Region – Draft Report*, September 2005, p 2.

Although Services Sydney argued in favour of the vertical separation of monopoly and contestable parts of Sydney Water,[60] so as to allow separate accounting to facilitate competitive entry, the Tribunal remains of the view that competitive entry can be facilitated without physical or accounting disaggregation if an Efficient Component Pricing Rule approach is adopted for access pricing (see Chapter 4).

The Tribunal's analysis and conclusions on each disaggregation option are discussed below. Based on this analysis and the responses to the Draft Report, and in line with its adaptive management approach to industry reform (discussed in Chapters 1 and 8), the Tribunal recommends that while disaggregation of Sydney Water should not occur at this time, work should continue to examine the benefits and costs of such reform.

5.1 Disaggregating Sydney Water horizontally to pursue productive efficiency gains

The Tribunal's Draft Report identified two philosophical approaches to decisions to disaggregate large, monopoly utilities such as Sydney Water. The first involves an in-principle decision that disaggregation is desirable and should take place unless there is evidence that it will result in significant losses of efficiency or costs (negative assurance). The second requires that there be reasonable confidence that disaggregation will result in efficiency gains, cost savings or other benefits before a decision to disaggregate is made (positive assurance). The Tribunal has adopted the second approach, given that its objective in this review is to identify the industry arrangements that will optimise the efficiency, effectiveness and sustainability of service delivery, and that the primary problem confronting the industry is one of water scarcity rather than productive inefficiency.[61]

The Tribunal identified three potential sources of benefits from the disaggregation of Sydney Water, including:

- *Economies and diseconomies of scale.* Disaggregation could lead to efficiency gains if Sydney Water is currently larger than the optimal size for a water utility and thus characterised by diseconomies of scale.
- *Comparative performance and yardstick competition.* Disaggregation could lead to efficiency gains if it resulted in effective yardstick competition between the newly formed businesses.
- *Changes in management approaches and culture.* Disaggregation could lead to efficiency gains if it resulted in positive changes to management approaches and decision-making in the newly formed businesses.

The Tribunal's findings on each of these arguments are discussed below.

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60 See Services Sydney Pty Ltd submission to IPART, *Investigation into Water and Wastewater Service Provision in the Greater Sydney Region - Draft Report*, October 2005, p 1.

61 This view was generally supported by stakeholders. See, for example, Public Interest Advocacy Centre (PIAC) submission, June 2005, p 5; Sydney Water Corporation submission, July 2005, p 32; and AGL submission to IPART, *Investigation into Water and Wastewater Service Provision in the Greater Sydney Region – Draft Report*, June 2005, p 1.

5.1.1 Economies and diseconomies of scale

As noted in the Draft Report, there is evidence to suggest that water and wastewater services are characterised by significant economies of scale, which occur when the unit cost of production decreases as the volume of output increases. However, there is also evidence to suggest that when water utilities reach a certain size (for example, in terms of number of connections served), they begin to experience diseconomies of scale – that is, the unit costs of production begin to increase as output increases.

The Tribunal examined a number of studies that have been conducted in other jurisdictions to look at economies and diseconomies of scale in the water industry (see Appendix G). Based on the findings of these studies, the Tribunal concluded that, in serving approximately 1.6 million connections, Sydney Water is at or approaching a size at which water utilities in other jurisdictions have been found to experience diseconomies of scale. The Tribunal also noted that this number of connections is significantly larger than the minimum number that some sources assert is required to achieve economies of scale.[62] However, the Tribunal considers that these studies cannot provide direct 'evidence' of the optimal size for water utilities in Sydney – operational characteristics differ significantly between water utilities, and so the conclusions of a study on one particular utility cannot be automatically applied to another.

Given the lack of information specific to Sydney,[63] the Tribunal considers there is insufficient information or evidence to determine whether Sydney Water is currently characterised by diseconomies of scale, let alone to determine the extent of any such diseconomies. It therefore believes that the potential benefits of addressing diseconomies of scale do not provide sufficient justification for pursuing horizontal disaggregation at this time, but that the costs and benefits of horizontal disaggregation continue to be assessed.

5.1.2 Comparative or yardstick competition

In its Draft Report, the Tribunal discussed how disaggregating Sydney Water horizontally could potentially allow 'comparative competition' between two or more water utilities in the Greater Sydney metropolitan area. The Draft Report explained how having two or more comparable providers of water and wastewater services can lead to productive efficiency gains by exerting pressure on managers to improve the performance of their businesses. The Tribunal noted that this pressure can be particularly effective if information on comparative performance is made readily available to stakeholders and the wider community. Having two or more 'comparable' utilities can also help to reduce the incidence of asymmetric information between regulator and regulated utility, thus improving the effectiveness of regulation. The Tribunal noted the example of Melbourne, where the Essential Services Commission (ESC) reports annually on the three retail water companies' performance against indicators that relate to quality of supply, reliability of supply, affordability, customer service and environmental performance.

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62 See Strategic Management Consultants, 2002, and World Bank, 1997, in Appendix G.

63 In its initial submission to the review, Sydney Water stated that "the Australian industry experience implies that there are significant economies of scale, with urban utilities typically serving around 1 million people" (Sydney Water Corporation submission to IPART, *Investigation into Water and Wastewater Service Provision in the Greater Sydney Region,* July 2005, p 18), but the Tribunal was not able to identify any more specific information.

However, the Tribunal notes that utilities subject to comparative competition need to be relatively comparable if this mechanism is to be effective. In its Draft Report, the Tribunal noted that were Sydney Water to be disaggregated, the disaggregated entities would probably be quite different in terms of costs and operational characteristics. The Tribunal remains of this view, and for this reason, the Tribunal believes that the potential benefits of comparative competition do not provide sufficient justification for horizontal disaggregation.

5.1.3 Changes in management approach and culture

A further argument for disaggregation is that the process of restructuring itself can provide an opportunity for innovation and change within a utility, resulting in major gains in productivity. These gains can arise from a number of sources, including the bringing-in of new skills and experience, new systems and management regimes, and new workplace cultures.

While the Tribunal was able to identify anecdotal evidence of these benefits, associated with the restructuring of the Melbourne water industry in the 1990s, the Tribunal was not able to quantify the extent of potential benefits from a change in water utility practices or culture as a result of disaggregation. The Tribunal has not identified any further, quantifiable evidence, and therefore retains its view that these potential benefits do not provide sufficient justification for the disaggregation of Sydney Water at this time. The Tribunal does however note that other parts of its recommendations, particularly in relation to competitive procurement (discussed in Chapter 2) and introducing open access to water and wastewater infrastructure (discussed in Chapter 3) may well act as a catalyst for such changes, and associated productive efficiency gains.

5.2 Disaggregating Sydney Water horizontally to address likely issues with a Growth Centres Commission water authority

As explained in the Draft Report, the Government is undertaking a program of initiatives to address forecast population growth in the Greater Sydney metropolitan area. A Growth Centres Commission has been established to coordinate the orderly rollout of land release and infrastructure, and the Commission is set to become a water supply authority. The Tribunal noted that when considering the geographic boundaries of Sydney Water and a Growth Centres Commission water authority, two specific issues are likely to arise:

- *The financial viability of a Growth Centres Commission water authority on standalone basis.* Given the initial small size of the growth centres, and the moderate pace of their expected growth,[64] a water utility established on a standalone basis to service these areas is unlikely to achieve a minimum efficient scale. In addition, a standalone business is likely to require significant financial or cash flow support, given that in the early years it will have high expenditure requirements but a limited customer base.
- *The higher cost structure of a Growth Centres Commission water authority on standalone basis.* It is expected that the average cost of providing water and wastewater services in the growth centres will be significantly higher than the average cost of services to the Sydney Water service area. This has implications for cost-recovery and pricing in the Growth Areas. To achieve cost-reflective prices and recover the costs of service provision, prices in the Growth Areas would need to be significantly higher than in the

64 The growth centres are not expected to reach their ultimate size of 160,000 new dwellings until approximately 2030.

rest of Sydney, where Sydney Water's prices are based on the average cost of supply throughout the Greater Sydney metropolitan area.

In its Draft Report, the Tribunal considered several ways in which the Government and the Growth Centres Commission might decide to address these issues. Firstly, both issues could be managed in the short to medium term by financial support from the Government to the new water authority, funded directly or indirectly through some kind of levy or cross subsidy. Secondly, some of the difficulties associated with insufficient scale could be addressed by the new water authority contracting out service provision (or parts of service provision).[65] Thirdly, both issues could potentially be addressed by transferring assets, functions and customers from an existing Sydney Water service area to the new water authority.

The Tribunal considered how the latter option might work, given that it would involve effectively disaggregating Sydney Water. The Tribunal identified two ways in which this might be done:

- A River-Ocean split along wastewater catchment lines, which Sydney Water indicated is a logical boundary. Under this scenario, a 'Sydney-River' business would service those customers whose wastewater was inland draining (ie, those areas with tertiary treatment and river discharge) and a 'Sydney-Ocean' business would service those customers whose wastewater was coastal draining (ie, those areas with primary treatment and discharge into the ocean). As water reservoir zones do not exactly match wastewater catchments, interface arrangements with respect to the water system would be required.
- A North-South split, dividing the utility into a northern business and a southern business (essentially north and south of the Harbour/Parramatta River), with each business' area of operations containing a Growth Centre.

The Tribunal found that under both options, both businesses would reach sufficient scale. It found that a River-Ocean split would involve a minimum sharing of assets, and that a North-South split would be more complicated technically, as major infrastructure would be shared between the North and South businesses. However, the Tribunal found that under the River-Ocean option, the costs of a Sydney-River business would be around 1.6 times those of a Sydney-Ocean business (for water and wastewater services combined).[66] This is essentially due to differences in the wastewater treatment technologies each business would use (and their different costs), although it also reflects differences in population density. The costs of the businesses formed under the North-South option would also be different, but to a lesser extent.

In its Draft Report, the Tribunal concluded that disaggregation, particularly on a River-Ocean basis, would involve making the cross subsidies within the current postage stamp

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65 One of the advantages of establishing a Growth Centres Commission is the ability for the Commission to direct and co-ordinate infrastructure investment across the new growth areas. For example, the Growth Centres Commission could contract out the supply of water and wastewater services to Sydney Water, but contract out the provision of recycled water to a new entrant.

66 Note that this figure is an estimate of direct service costs – it does not include corporate overhead and customer service costs. However, it is not expected that the inclusion of those costs would significantly change the differential.

pricing arrangements in Sydney explicit.[67] It considered that because of the size of the cost differentials between River and Ocean areas, it was unlikely that the Government would support pricing on the basis of the *full* cost differentials. The Tribunal therefore considered two options for addressing these issues: the transfer of shared assets to the Catchment Authority, or addressing cost differences by non-structural means. Each option is explained below. The Tribunal notes that if considering these options, the Government will need to decide whether it wants to achieve completely uniform water prices across the disaggregated businesses, or whether it is prepared to have some divergences in prices, provided these are 'reasonable' (this issue is discussed further below).

5.2.1 Transferring shared assets to the Catchment Authority

In its Draft Report, the Tribunal noted its understanding that the problem of 'shared assets' could largely be addressed by transferring treatment plant, large water mains and, potentially, pumping station assets to the Catchment Authority. That is, the Catchment Authority's role would essentially change from being the supplier of '*raw*' water to Sydney to being the supplier of *potable* water.

The Tribunal analysed the likely costs involved in transferring these assets to the Catchment Authority. It noted that significant changes would be needed to governance and regulatory arrangements to reflect the Catchment Authority's new role, and that the Catchment Authority would need to take on staff with the relevant expertise. Further transactions costs would arise from the need to change the contractual parties to current build-own-operate projects for water treatment plants. The Tribunal also noted that under a River-Ocean split, the benefits arising from the averaging of water treatment costs would be limited, because they would only go some way to addressing the significant cost differentials that exist between the two areas.

The Tribunal has further considered the issue of ownership of new bulk water supply sources (eg, a desalination plant). In its submission to the Draft Report, AGL argued that Sydney Water should not own and operate any new source of supply, as separation of competitive activities from monopoly infrastructure will "ensure that supplies to Sydney Water are costed transparently, both as a signal to Sydney Water in the conduct of its operations, and as a signal to potential suppliers." According to AGL, this separation will also "ensure clarity of Sydney Water's role in sourcing and distributing supplies as opposed to production, and avoid the need for subsequent separation if structural disaggregation of Sydney Water is undertaken at some time in the future. It is also consistent with the separation that has occurred in other industries as a precursor to open access."

The Tribunal is of the view that facilitating a dynamic water and wastewater market through implementing competitive sourcing and access to infrastructure (as recommended in chapters 2 and 3) would be supported by prohibiting Sydney Water from owning and operating new bulk water supply sources. Given new supply sources will effectively compete with each other, to ensure competitive neutrality they should be owned and operated separately from Sydney Water, either by the State or the private sector. The Tribunal further believes that it should not be assumed that all future transportation infrastructure will be owned and operated by Sydney Water.

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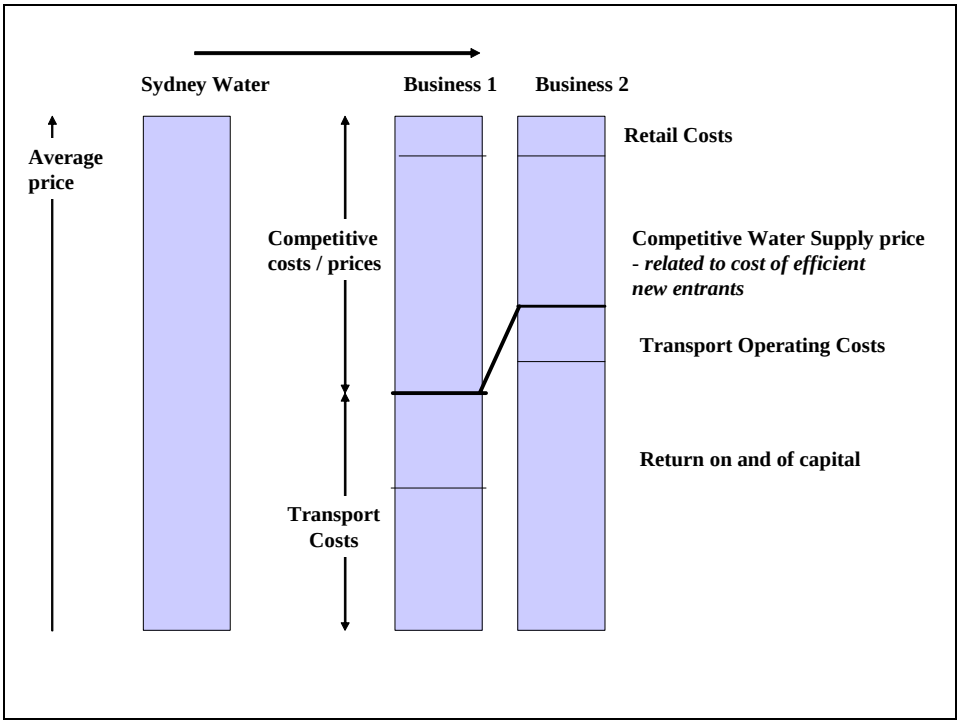
[67] Currently all Greater Sydney customers within a given customer class pay the same price for water/wastewater service regardless of their location.

5.2.2 Addressing differences in cost structures through non-structural means

The Tribunal identified a number of non-structural options for transferring costs between disaggregated entities in its Draft Report.

Firstly, the Initial Capital Base (ICB) for the two businesses could be set/adjusted to 'capitalise' cross subsidies, by adjusting the value of the ICB for regulatory purposes (and subsequently altering the return on and of capital) until the overall cost of service is the same for both businesses. The principle for setting the ICB for government-owned monopoly assets is that it can be anywhere between the Optimised Depreciated Replacement Cost (ODRC) (or the Optimised Deprival Value (ODV)) and scrap value. If the lower end of the range is chosen, the business needs to be financially viable. This option is illustrated in Figure 5.1 below, where the return on and of capital for Business 1 is lower than for Business 2 to account for Business 1's higher costs and equalise the prices of both businesses.[68]

Figure 5.1 Adjustment of Initial Capital Base



68 This option has been applied in Victoria:
Victoria Electricity. The Victorian electricity industry was restructured in 1994. In order to achieve acceptable differentials between retail electricity prices charged by the two rural distribution businesses (DBs) and the three urban DBs; urban Initial Capital Bases (ICBs) were written up and rural asset ICBs were written down. This was combined with other subsidy mechanisms. After around six years, divergences between rural and urban retail prices started to emerge. This was due to gradual depreciation of the adjusted ICB and the addition of unadjusted new capital expenditures to the ICB.
Victoria water business. As part of the recent introduction of economic regulation, the government has set ICBs for all water business (rural and urban) based on the Discounted Cash Flows of each of the business so as to achieve a price path consistent with current prices. This has been to avoid price shocks. The Essential Services Commission provided advice to the Minister based on a Terms of Reference setting out the government's policy objectives.

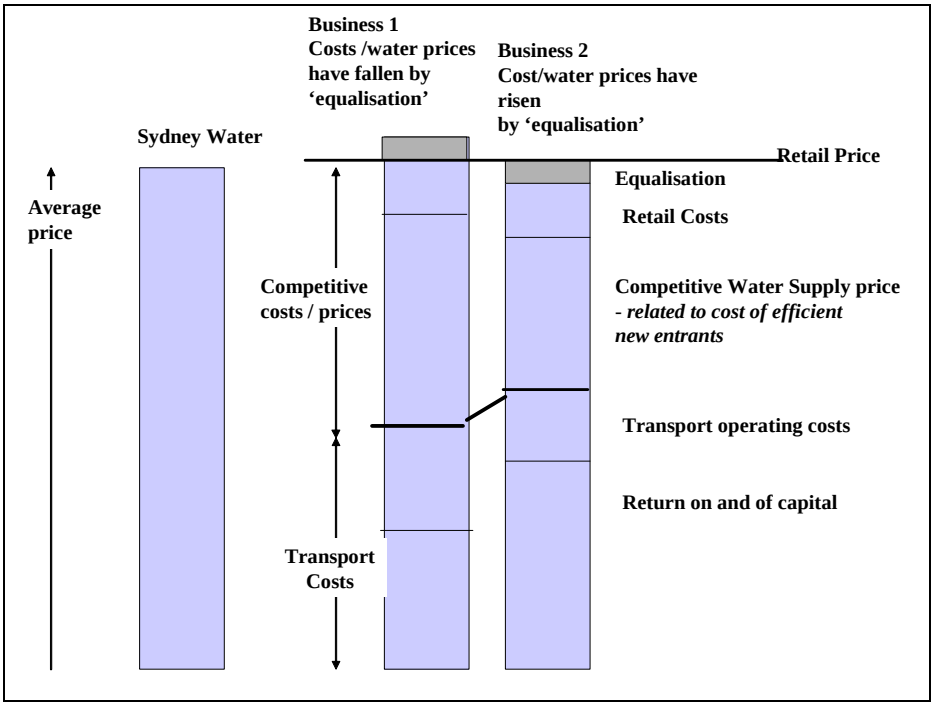
As noted in the Draft Report, detailed modelling would be needed to reach firm conclusions on the viability of the ICB option. For example, it would be necessary to establish the size of the adjustment to the ICB that would be needed either to equalise prices completely, or to reduce price differentials to a level considered acceptable by government. Similarly, it would be necessary to investigate (i) how quickly the cross-subsidy created by the ICB would unwind as assets are replaced at their "true" replacement value; and (ii) whether the reduced returns of and on capital would still provide sufficient cash-flows to maintain the financial viability of the business.

Even without undertaking such modelling, the Tribunal considers it likely that given the size of the initial cost differentials, (i) although an ICB adjustment may result in narrow price differentials in early years, these would be likely to gradually increase over time; and (ii) other steps may also be required to address the cost differentials, particularly to ensure that the overall financial strength of the businesses are maintained and are comparable.

A second option would be to establish direct subsidies or levies between businesses to ensure acceptable differentials between retail prices in the disaggregated areas (for example, an "equalisation payment"). Subsidies could be targeted at specific groups of customers, such as domestic customers only. They might be through equalisation transfers included in the Catchment Authority's prices, or via payments direct from the State budget. This option is illustrated in Figure 5.2, where customers of Business 2 effectively subsidise the customers of Business 1 by paying a higher price (via an 'equalisation' amount) than is purely cost-reflective.[69]

[69] Relevant experience on the use of direct subsidies and levies can be drawn from the Victorian electricity industry reform. In addition to adjustments to ICBs (noted above), equalisation amounts were incorporated into transmission charges such that rural distribution businesses (DBs) paid lower transmission charges than they otherwise would and urban DBs paid higher transmission charges. This was a one-off, up-front adjustment undertaken as part of the industry's restructuring.
As price differences emerged between rural and urban DBs due to the gradual depreciation of the upfront ICB adjustment noted above, the Victorian Government subsequently decided to introduce a rural pricing subsidy ("Special Power Payment"), administered by the rural DBs and targeted at household consumers. The Government makes on-going decisions on the level and nature of these payments as part of the annual budget process.

Figure 5.2 Levy or equalisation payment



In relation to the second option, introducing a levy or equalisation payment, the Tribunal notes that any form of cross subsidy (especially one that must be regularly reviewed rather than set on a one off basis) has the potential to cause ongoing dispute.

The Tribunal concludes that while non-structural options for addressing cost differentials exist, they are not without their drawbacks.

5.2.3 Considering regional differential water pricing

The Tribunal maintains the view set out in its Draft Report that based on preliminary analysis of the cost structures of the businesses likely to be created by disaggregating Sydney Water horizontally, it is questionable whether uniform pricing can be achieved across the Greater Sydney metropolitan area (particularly under a River-Ocean split). Respondents to the Draft Report did not provide any information to suggest otherwise. The Tribunal considers that if uniform pricing were to be attempted, it would almost certainly involve complicated administrative arrangements and the creation of incentive and gaming problems (eg, it might create an incentive for businesses to inflate their operating cost requirements to gain higher subsidies). The more volatile and unpredictable are costs and margins, the more difficult it will be to ensure uniform pricing.

If an equalisation or subsidy arrangement is required, from an efficiency and administrative simplicity perspective, it will be preferable to set any equalisation arrangement in advance. Ideally, this would be done on a multi-year basis, as part of the regulatory review of prices.

As noted in the Draft Report, policy direction from Government would be needed on each of the following issues before any modelling work could be conducted to investigate the viability of disaggregation options:

- The nature of the geographical split to be modelled. (Ie, on what basis should assets be allocated? River-Ocean, North-South or some other combination?)
- The extent to which price differentials are acceptable. (Eg, should modelling work assume zero price differential, a maximum of ten per cent differential, or a 20 per cent differential?)
- Whether there would be any explicit cross-subsidies/levies to assist in addressing cost differentials, and if so, how large and over what period?

5.3 Disaggregating Sydney Water vertically to facilitate the development of open access competition

As Chapter 3 discussed, the Tribunal recommends the establishment of an open access regime. This would allow new entrants to share access to Sydney Water's infrastructure and services that exhibit natural monopoly characteristics (eg, water and wastewater transportation), while competing in the areas that are potentially competitive (such as water storage and harvesting, wastewater treatment and disposal, and retail services). (See Appendix B for a more detailed explanation of this approach.)

In its Draft Report, the Tribunal noted that third party access can be introduced to a vertically-integrated monopoly such as Sydney Water. Alternatively, access regulation can also be accompanied by the vertical separation (or 'unbundling') of an incumbent monopoly's non-competitive activities from its competitive activities. The Tribunal observed that vertical unbundling can take a number of forms, ranging from accounting separation through to full legal separation. In many industries, the latter approach was seen as the way to maximise competition under an access regime, because it reduces incentives for the incumbent provider of the monopoly services to engage in any activities that may restrict competitive entry. In its response to the Draft Report, Services Sydney favoured vertical accounting separation (of monopoly and contestable functions) on the grounds that this would facilitate competitive entry.[70]

While the Tribunal acknowledges that vertical unbundling of Sydney Water could enhance access service and help to maximise competition under an access regime, the Tribunal maintains its view that this option is not warranted at this stage on the grounds that:

- Vertical unbundling is not, in the Tribunal's opinion, a *prerequisite* for a competitive access regime – the Tribunal's proposed ECPR approach to access pricing can be implemented in the absence of information about the unbundled costs of Sydney Water's services. (This is discussed further in Chapter 4.)
- The Tribunal notes that vertical unbundling can involve significant transactions costs, and it considers that there is insufficient information available to guarantee that the cost of such structural reform would be outweighed by the associated benefits at this point in time, particularly given that the level of demand for access is largely unknown at this stage.

70 See Services Sydney Pty Ltd submission to IPART, *Investigation into Water and Wastewater Service Provision in the Greater Sydney Region – Draft Report*, October 2005, p 1.

The Tribunal recommends that the vertical separation of Sydney Water be reviewed in time, when more information is available on both the demand for access and the number of new industry participants (ie, when an assessment can be made of the extent to which competition has emerged under the Tribunal's proposed access arrangements). This is in line with the Tribunal's adaptive management (or 'evolutionary') approach to water and wastewater industry reform (as discussed in Chapters 1 and 8).

Recommendation 8

That the Government not undertake structural disaggregation of Sydney Water at this time, but continue to examine the benefits and costs of such reform.

6 REMOVING BARRIERS TO COMPETITION, PRIVATE SECTOR PARTICIPATION AND INNOVATION

As discussed in previous chapters and its Draft Report, the Tribunal recommends that steps be taken to open Sydney's water and wastewater industry to competition, with the aim of creating a more dynamic market in which private sector participants compete to identify opportunities to provide innovative water and wastewater services that meet customers' needs within an environment of increased water scarcity. For such a market to develop and flourish, changes are required to aspects of the existing legal and regulatory arrangements for the industry.

The Tribunal reiterates its position outlined in the Draft Report that the following changes need to be made:

- Where warranted, remove impediments to private sector participation created by a range of statutory provisions.
- Improve arrangements for the collection and dissemination of information about the water and wastewater market, to better support private sector participation and innovation.
- Ensure that clear and robust guidelines and rules are in place for recycled water, to facilitate the matching of water quality to end use.
- Ensure that environmental impacts are adequately accounted for and factored into decision-making.

These proposed measures are discussed in more detail below.

In its Draft Report, the Tribunal also recommended that property rights regimes be established for sewage and stormwater. However, it has since thought further about this issue, which is also discussed below.

6.1 Removing statutory impediments to private sector participation

As outlined in the Tribunal's Draft Report, while there are no express legislative provisions on private sector involvement in the water and wastewater industry, there are several statutory provisions that impede such involvement. For example:

- Statutory deemed contracts (and associated payment obligations) between Sydney Water and land owners under section 55 of the *Sydney Water Act 1994* will continue to apply notwithstanding the land owner entering a new agreement for the same services with a private sector entity.
- Under section 16(1) of the *Sydney Water Catchment Management Act 1998,* the Sydney Catchment Authority (SCA) can supply water to persons and bodies in addition to Sydney Water, water supply authorities or prescribed local councils, "but under terms and conditions that prevent the person or body concerned from supplying the water for consumption by others within the State unless the person or body is authorised to do so by or under an Act." There is no such legislation in place authorising a private sector body to supply water for consumption.

- Any person who is supplied water by a private sector entity must have a 'water use approval' in place, under section 342(1)(a) of the *Water Management Act 2000*.
- To utilise Sydney Water's wastewater infrastructure requires an agreement with Sydney Water, as it is an offence under section 49(1) of the Sydney Water Act to discharge any substance into a work owned by Sydney Water without a written agreement.
- To develop private infrastructure to supply recycled water or wastewater services, a private sector entity would need various planning, construction and property access approvals, licences and consents. Unlike existing water authorities, the private sector body would have no statutory rights to access or acquire property to construct and maintain works.

Consequently, the Tribunal maintains its assertion that current legal and regulatory arrangements need to be reviewed to identify all statutory impediments to private sector involvement and competition in Sydney's water and wastewater markets, and, where warranted, statutory changes made to remove these barriers.

In its submission to the Draft Report, AGL contends that the establishment of a licensing/authorisation regime is critical to facilitating private sector participation in the water and wastewater industries.[71] A licensing regime provides a vehicle for imposing basic obligations and accountabilities on participants, to ensure that consumers and the broader public interest are adequately protected (as discussed in Chapter 7). It is also a means of conferring rights on entrants to allow them to carry out certain activities and participate in the market or industry. "Importantly, a licence and the rights and obligations that attach to it, provide certainty for investment decisions."[72] AGL suggests that the Gas Supply Act (GSA) is an appropriate model for implementing a licensing regime. According to AGL, a regime analogous to the Gas Supply Act could be established for water through new legislation or, "perhaps more efficiently", by amendment of existing legislation such as the *Water Management Act 2000*.[73]

AGL also believes that, in order to avoid unnecessary delay, preparatory work on licensing should be undertaken as a matter of priority, concurrently with work on the broader legislative framework; and that focus should be on those aspects of the legislative/licensing regime that facilitate private sector involvement in the construction, ownership and operation of infrastructure for water supply. This includes, for example, providing private sector participants with appropriate rights to access land and lay pipe.[74] According to AGL, "Access and retailing aspects of the licensing regime are less urgent."[75] AGL's position reflects its belief that there are "significant opportunities that could be implemented relatively quickly to assist in alleviating Sydney's supply problems."[76]

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71 AGL submission to IPART, *Investigation into Water and Wastewater Service Provision in the Greater Sydney Region - Draft Report*, September 2005, p 2.

72 Ibid.

73 Ibid.

74 "Certainty of ownership of infrastructure, once installed is also essential. This is particularly the case where the infrastructure is in or on public land. Ownership should be confirmed in legislation." (Ibid, p 3.)

75 Ibid, p 4.

76 Ibid, p 3.

The Tribunal notes that considerable work has already occurred in developing and implementing a licensing regime for the water industry. Sydney Water, Hunter Water Corporation and the Sydney Catchment Authority are all issued operating licences, which are periodically audited and reviewed by the Tribunal. Therefore, in developing a licensing/authorisation regime for new entrants in the water and wastewater industry, the Government could use this existing system (including Sydney Water's operating licence) as a starting or reference point – particularly given the special features of the water industry (eg, public health and environmental concerns). The role of a licensing/authorisation regime for the water industry is discussed further in section 7.2

The Tribunal's recommended approach to implementing appropriate legislative change, as well as its recommended reform program in general, is discussed in Chapter 8.

Recommendation 9

That the Government review current legal and regulatory arrangements to identify all statutory impediments to private sector involvement and competition in Sydney's water and wastewater markets, and, where warranted, remove these impediments.

6.2 Improving arrangements for collection and dissemination of system and resource information

As noted in the Tribunal's Draft Report, for competitive and innovative water and wastewater markets to succeed, participants need to be able to efficiently access a range of information about these markets. If it is costly to access information or relevant information is simply unavailable, this is likely to present a substantial barrier to market participation and innovation.

In Australia's National Electricity Market, the National Electricity Market Management Company (NEMMCO) has responsibility for providing information to assist market participants (see Box 6.1). Similar arrangements exist in competitive utility markets in other countries. This reflects the fact that identifying and implementing investment opportunities in competitive utility markets typically requires timely access to a large amount of information.

In its submission to the Tribunal's Draft Report, AGL states that an important prerequisite for private sector participation in the water/wastewater industry and for the successful implementation of a number of the Tribunal's recommendations is improved arrangements for the collection and dissemination of information. The Australian Council for Infrastructure Development (AusCID) is in favour of regular *Statements of Opportunity* for the water market, as per the National Electricity Market.[77]

Consequently, as a first step towards making appropriate information on Sydney's water and wastewater markets available, the Tribunal maintains its view that:

- Sydney Water should be required to regularly prepare and publish a *System Information Statement*; and

[77] AusCID submission to IPART, *Investigation into Water and Wastewater Service Provision in the Greater Sydney Region - Draft Report*, October 2005.

- given Sydney Water's market power, the Tribunal should oversee the development and consultation process in relation to the provision of information, and should be provided with appropriate enforcement powers.

As per the Draft Report, the following sections discuss:

- what information should be made available
- how this information should be managed and disseminated
- the Tribunal's suggested approach for implementation.

Box 6.1 Provision of information in the National Electricity Market

The National Electricity Market Management Company (NEMMCO) was established in 1996 to administer and manage the National Electricity Market, and is owned by the participating State governments. Each year, it publishes a *Statement of Opportunities* (SOO), which is a 10-year forecast intended to help market participants assess the future need for generation capacity, demand-side response and augmentation of the network. It contains a wide range of information, including:

- demand forecasts
- details about the capacity of existing and committed generating plant
- transmission capability advice on the impact of technical limits on the network
- various other details to assist potential investors to gain a full understanding of the National Electricity Market.

NEMMCO undertakes regular consultation with stakeholders to ensure the information provided in the SOO is relevant to stakeholders needs. It also publishes other information, including the *Projected Assessment of System Adequacy*, which provides forecasts ranging from 7 days ahead to 2 years ahead.

6.2.1 What information should be available?

Information about the water and wastewater market can be divided into three categories:[78]

- **System information,** which includes information related to existing operating systems (System Operation Information), and short to medium-term planning for these systems. It also includes information related to planning for the long-term integrity and adequacy of systems (System Planning Information). (See Table 6.2 for more detail.)
- **Resource information,** which includes information on the availability, quality, reliability, security, and constraints on use of various water resources (eg, wastewater, stormwater, groundwater, irrigation water, grey water), which could have a particular focus on water resources not currently utilised.
- **Commercial information,** which includes information owned by a particular party, some of which may be commercially sensitive.

In general, all system and resource information should be available for public release.

[78] The Tribunal's open access framework envisages information disclosure by access providers. While consultation would be required on the exact nature of such information disclosure, it may include a requirement to publish indicative access prices, terms and conditions (see section 3.3.1).

Table 6.2 System information

System operation	Operating systems associated with: - Potable supply - Recycled supply - Wastewater	Short and medium-term planning, scheduling and dispatch of water including: - use of storages - transfers - pumping - transmission congestion management - quality/treatment optimisation - asset management (eg, redundant assets usage when primary assets fail)
System planning	Planning to ensure long-term integrity and adequacy of systems associated with: - Potable supply - Recycled supply - Wastewater - Stormwater	Long-term system planning including: - forecasting - maintenance scheduling - infrastructure planning, augmentation - major asset replacement - Security of supply standards - Security of supply monitoring - Security of supply management (responsibilities, accountabilities)

6.2.2 How should this information be managed and disseminated?

In determining how information related to the water and wastewater market should be managed and disseminated, various interests need to be taken into account. For example, market participants (including the incumbents) have an interest in protecting legitimate commercial information. As the Auditor General has noted, the public has an interest in accessing information that underpins the Metropolitan Water Plan, given that the measures being implemented under this plan will have widespread community impact.[79] It is also in the public interest to ensure that the information released does not jeopardise the security of critical infrastructure (for example, by exposing it to a higher risk of terrorism).

As some of these interests are conflicting, clear principles and processes need to be established to ensure these interests are recognised and balanced appropriately. The Tribunal suggests that the following principles be used to guide the management and dissemination of information:

- Information should be clearly identified and categorised as *system* information, *resource* information or *commercial* information.
- In general, all system and resource information should be available for public release. Decisions to hold such information confidential should have clear public interest justification (eg, for security reasons).

[79] NSW Audit Office, *Auditor General's Report Performance Audit: Planning for Sydney's Water Needs*, May 2005, www.audit.nsw.gov.au.

- Commercial information should be confidential to its owner, unless it can be shown that there is a clear public interest in making it publicly available without undue harm to the owner of this information.
- There should be regular consultation with market participants on the nature of the system and resource information they require.
- Provided there is a cost benefit justification (for example, there is sufficient demand for the information and it is not excessively costly to collect), system and resource information that is reasonably required by potential and actual participants should be kept up to date and regularly published in an accessible form.
- Costs of collecting system and resource information should be recovered from users, but should not create an undue barrier to entry.

6.2.3 Suggested approach for implementation

Several public authorities hold different system and resource information on Sydney's water and wastewater markets – including Sydney Water, the Sydney Catchment Authority, the Department of Planning, the Department of Natural Resources, the Department of Energy, Utilities and Sustainability and, in future, the Growth Centres Commission. Currently, this information is brought together in the Metropolitan Water Plan.

The Tribunal notes that the Auditor General has recommended that more detailed information underpinning the Metropolitan Water Plan should be publicly released.[80] The Tribunal suggests that a pragmatic approach for developing and publishing information relating to the Metropolitan Water Plan might be to split the process into two distinct stages.[81]

In the first stage, Sydney Water would prepare and publish a *System Information Statement*, as discussed above. This statement would be a long-term forecast of demand and supply that enables the identification of emerging investment opportunities and the possible timing for new investments.

In the second stage, the Government would prepare and publish detail on the Metropolitan Water Plan itself. This could be expanded to set out water resource information, and to include all committed projects and investigations being commenced by all participants in the market, including new entrants.

Recommendation 10

That the Government improve arrangements for the collection and dissemination of information about the water and wastewater market to better support private sector participation and innovation, and that the Tribunal have regulatory oversight of information arrangements.

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80 NSW Audit Office, *Auditor General's Report Performance Audit: Planning for Sydney's Water Needs*, May 2005, www.audit.nsw.gov.au.

81 Currently, the Metropolitan Water Plan is scheduled to be reviewed and updated every five years. NSW Government, *Meeting the Challenges – Securing Sydney's Water Future*, The Metropolitan Water Plan 2004, October 2004, p 3.

6.3 Ensuring clear and robust guidelines and rules for recycled water are in place

Currently, recycled wastewater water is not used for potable purposes in NSW. Nevertheless, there remains a variety of non-potable urban water demands that could effectively be supplied by recycled water, including outdoor residential and non-potable use (where dual reticulation systems can be incorporated into new developments), urban irrigation (sports fields, public gardens, market gardens, etc), environmental flows and a range of industrial and commercial uses.[82]

To optimise the use of alternative water resources and ensure that the quality of water is appropriately matched to its end use, robust and clear guidelines and rules for recycled water must be place.[83] These guidelines and rules play an important role in guiding potential developers and service providers.[84] Therefore, they should be capable of being applied to a range of different recycling and reuse schemes and uses. They should also keep pace with the evolution of the market, in terms of new sources of and applications for recycled water and new treatment technologies. In addition, they should not raise unnecessary barriers to innovation by private developers and service providers.[85]

Various guidelines for recycled water currently exist. However, as noted in the Tribunal's Draft Report, they are spread over a number of NSW and national documents and may not be applicable to all potential sources and uses of, and new treatment technologies for, recycled water. For instance, researchers have identified a number of gaps and deficiencies in some of the current guidelines, including the national *Guidelines for Sewerage Systems – Use of Reclaimed Water*.[86]

In its submission to the Tribunal's Draft Report, Sydney Water "agrees that gaps exist in the current regulatory framework for recycled water, which, in some cases, could hinder uptake of recycled water."[87] The Australian Council for Infrastructure Development (AusCID) believes that a single regulator is needed, and that guidelines need to promote rather than inhibit recycling.[88] NSW Health points out that it is working with other agencies, including the Department of Planning and the Department of Energy, Utilities and Sustainability, "to help develop a clear and balanced regulatory and management framework for recycled

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82 Preliminary estimates by the Tribunal suggest that the level of recycled water use may reach around ten per cent of the current estimate of the sustainable yield from existing water storages. Displacing this amount of potable water use would go a long way to meeting the requirement for drinking water of the growing population in the Greater Sydney area.

83 For the purposes of this report, 'recycled water' refers to generic water reclamation and reuse, including stormwater, sewage and greywater.

84 These guidelines also play an important role in protecting and providing assurance to end users. This issue is discussed in Chapter 7.

85 As recognised by the Government's Metropolitan Water Plan 2004.

86 According to the Australian Academy of Technological Sciences and Engineering (AATSE, *Water Recycling in Australia*, 2004, p 17), the national *Guidelines for Sewerage Systems – Use of Reclaimed Water* provides only limited guidance for use of recycled water in the urban environment, primarily for amenity horticulture. AATSE (2004, pp 131 and 137) also point out that these guidelines are not directly applicable to grey water or stormwater, and that the *Australian Guidelines for Urban Stormwater Management* "do not give adequate consideration to the harvesting and use of urban stormwater as an additional water resource".

87 Sydney Water Corporation submission to IPART, *Investigation into Water and Wastewater Service Provision in the Greater Sydney Region – Draft Report*, September 2005.

88 AusCID submission to IPART, *Investigation into Water and Wastewater Service Provision in the Greater Sydney Region – Draft Report*, October 2005.

water."[89] It also supports the direction being taken in the development of the new National Recycled Water Guidelines (*National Guidelines on Water Recycling: Managing Health and Environmental Risks*), "which will apply a preventive risk management approach to the operation of recycling schemes."[90]

As per its position in the Draft Report, the Tribunal believes that all the guidelines and regulations for the use of recycled water relevant to NSW should be regularly reviewed, to ensure they are clear, robust and applicable to all sources of and applications for recycled water. These reviews should consider NSW and national guidelines, including those that currently apply and those that are being developed. Some important issues to be considered include:

- continuing technological developments, which can contribute to a broader and safer application of reuse water
- community acceptance and attitudes to the use of recycled water, and the potential for these views to change over time and as circumstances change
- the sensitivity of some industrial uses to particular water quality parameters
- the fact that stormwater quality in particular can vary significantly, depending on site characteristics and local environmental conditions.

NSW Health believes that the review of guidelines should also keep pace with advances in science, technology and understanding of health risk; and that guidelines should provide accreditation processes that do not hinder 'evolution of the market' but adequately protect public health and the environment.[91]

Where necessary, new guidelines should be developed in order of priority, starting with those for types/applications of water recycling where there are gaps or no existing guidelines, those where health and environmental uncertainties are the greatest, where innovation is moving fast, and where the greatest potential for substituting for potable water supplies exists. To determine the highest priority options and to draft and refine guidelines accordingly, the Government should consider developing mechanisms to engage stakeholders and to 'test' the market.

Recommendation 11

That the Government ensure that clear and robust guidelines and rules are in place for all potential sources and applications of recycled water, including for:

- ***the harvesting and use of urban stormwater***
- ***the use of recycled water for a range of key industrial applications***
- ***the use of grey water at both the household level and for larger scale applications and uses.***

89 NSW Health Department submission to IPART, *Investigation into Water and Wastewater Service Provision in the Greater Sydney Region – Draft Report*, October 2005.
90 Ibid.
91 Ibid.

Recommendation 12

That guidelines and regulations for the use of recycled water be subject to ongoing review and development to ensure that they are comprehensive, clear and outcomes-focused and that they keep pace with the evolution of the market and advances in science, technology and the understanding of health risk.

6.4 Ensuring all environmental impacts are adequately factored into decision-making

To achieve the sustainable use of all water resources, including the development of alternative water supplies, it is important that all the environmental costs of providing water services (as well as all other economic costs) are adequately factored into the production decisions of water services providers and the consumption decisions of consumers. For example, if the price of water from conventional sources (eg, dams) does not adequately reflect the environmental costs associated with providing this water, then it is likely that this resource will be consumed at a greater than optimal level. A price lower than the true cost of supply can have a series of short and long-term ripple effects throughout the market, which can include impeding the development of alternative sources of water such as stormwater and/or sewage reuse.

In the Draft Report, the Tribunal stated its view that, as a first step, guidelines for valuing the environmental impacts associated with the provision of water services need to be developed and that these guidelines should be applied by all relevant decision-makers and government agencies. The Tribunal maintains this position.

The following sections generally follow the contents of the Draft Report in discussing:

- the environmental costs of water service provision and the current approach to factoring these costs into production and consumption decisions
- the Tribunal's suggested approach for developing guidelines for valuing the environmental impacts of water service provision.

6.4.1 Environmental costs of water service provision and current approach to capturing these costs

The provision of water services can impose significant costs on society via environmental degradation. In Sydney, these environmental impacts relate primarily to changes in the natural flow of rivers and water quality as a result of water extraction and wastewater discharges. For example, the Hawkesbury-Nepean River is showing signs of substantial environmental stress due to these changes, which will impact on the tourist, agriculture, fishing and recreation industries in the Hawkesbury-Nepean valley.[92]

Currently, the costs of these environmental impacts are primarily factored into production and consumption decisions via the regulatory requirements imposed on the water authorities by the Department of Natural Resources (DNR) and the Department of Environment and Conservation (DEC). For example, the Catchment Authority is required, under its water management licence with DNR, to release a minimum volume of water to the

92 *Meeting the challenges – Securing Sydney's water future, The Metropolitan Water Plan 2004*, NSW Government, October 2004, p 20.

environment ('environmental flows') to help protect the ecological health of the river system.[93] The environmental flow regime is one of a number of factors that determine the amount of water that is available for Sydney's consumptive use, and therefore it can affect the Long Run Marginal Cost (LRMC) of water supply. As the Tribunal has used estimates of the LRMC of water supply as a reference point for setting water usage prices, the environmental flow regime can also affect water prices. In terms of pollutant discharges to the environment, DEC imposes requirements on discharges of wastewater from Sydney Water's sewage treatment plants. The cost to Sydney Water of compliance with these requirements is reflected in prices for its services, via the Tribunal's pricing determination.[94] (The Tribunal is currently further developing its approach to addressing environmental externalities in determining water prices. It intends to release a paper explaining its approach in the near future).

However, there is some uncertainty as to what extent these regulatory requirements, and hence prices, reflect ('internalise') the environmental costs of water and wastewater service provision;[95] and some stakeholders have questioned the adequacy of current regulatory arrangements, citing the poor health of the Hawkesbury-Nepean River system as evidence.[96]

If regulatory requirements and prices are to adequately address and reflect the environmental impacts of water services, a co-ordinated approach by regulatory agencies is required. This is because the regulatory instruments used by DNR and DEC and the environmental issues that these instruments aim to address are closely related. For instance, both DEC's licence requirements and DNR's environmental flow regime can impact on river nutrient levels (as well as prices for water services). Discharges from sewage treatment plants can also change the natural flow of rivers and act as 'flows' to the environment and downstream irrigators.[97]

In recognition of these interdependent relationships, the Hawkesbury-Nepean Catchment Management Authority (HNCMA) argued in its submission to the Tribunal for a more integrated and co-ordinated approach to water management. It believes such an approach should:

- link water extraction and wastewater disposal as parts of the same management cycle
- require an integrated planning and regulatory framework applying to all policy and practice influencing water resources and aquatic ecosystems

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93 As acknowledged in the Metropolitan Water Plan, environmental flows are currently insufficient to maintain river health downstream of the dams and additional water for the environment will be required in the Hawkesbury-Nepean River system to avoid ongoing ecological damage. Consequently, the Government has announced its intention to develop a Sydney Metropolitan Water Sharing Plan, which will allocate a share of available water to the environment and introduce new environmental flow regimes to the rivers surrounding Sydney.

94 The Tribunal has the discretion to determine the efficient level of expenditure necessary for meeting relevant environmental requirements.

95 In 2003, the National Competition Policy Assessment noted that there was insufficient information to determine the extent to which externality costs are being incorporated into prices for water and wastewater services in NSW (*National Water Commission, Water Reform Framework 2005*, August 2005, p 77).

96 See submissions to the Tribunal's Investigation into Water and Wastewater Service Provision in the Greater Sydney Region by: the Hawkesbury-Nepean Catchment Management Authority (June 2005 and September 2005); and the Hawkesbury River Prawn Trawler Fishers (June 2005 and September 2005).

97 See Hawkesbury-Nepean Catchment Management Authority's submission to IPART, *Investigation into Water and Wastewater Service Provision in the Greater Sydney Region – Draft Report,* June 2005.

- ensure that water pricing acknowledges the impact and cost of the water deficit in the river system and the increasing cost on the river system of the discharge of wastewater. For example, it argued that the cost of aquatic weed outbreaks in the Hawkesbury-Nepean River (a consequence of low flow levels and high nutrient levels) should be reflected in water prices. [98]

6.4.2 Suggested approach for implementation

As a starting point for ensuring that the environmental impacts of water use are adequately captured by the regulatory framework, a robust and consistent approach to quantifying environmental costs and benefits should be developed. Such quantification should be an essential part of all decision-making that affects the water and wastewater industry – including assessing potential projects at the planning stage, setting environmental policy and regulatory requirements, and ensuring that prices are truly cost-reflective. Given the integrated nature of the water cycle, the environmental impacts of water services, and the regulatory instruments that are used to address these impacts, a coordinated and consistent approach across key agencies is required.

The Tribunal recognises that, while there is a range of methodologies and valuation techniques available,[99] the quantification of environmental costs and benefits can be extremely difficult and problematic. Cause-effect relationships can be complex and uncertain, and it can be difficult to translate environmental 'effects' into outcomes or values. Nevertheless, it is important that decisions are made based on methods and information that are as robust as possible. It is unlikely that decisions will be perfect, but once work has commenced on these guidelines, improvements can be implemented over time – consistent with the Tribunal's proposed adaptive management approach to industry reform.

The guidelines for valuing environmental impacts should:

- ensure that key agencies (including DEC, DNR and IPART) use a coordinated and consistent approach to value environmental impacts and apply these values to decision-making (including project assessment, policy and regulation setting and pricing)
- be specific to the provision of water and wastewater services in Sydney
- be open to stakeholder input and scrutiny
- be subject to review and decision making processes that are transparent
- provide guidance in identifying the full range of environmental impacts and costs associated with the provision of water services, and ensuring that double-counting does not occur

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98 Ibid.

99 In general, environmental valuation techniques include direct market methods (eg, improved water quality may result in higher crop yields, which can then be valued directly), 'revealed' preference methods (eg, the 'hedonic pricing' method and the 'travel cost' method) and 'stated' preference techniques (which involve the use of surveys to determine respondent's willingness to pay for a change in environmental quality). In recent times, 'choice modelling' is a well recognised stated preference technique that has been used to value a range of environmental impacts, including those associated with aquatic ecosystems. For example, see Morrison M and Bennett J (2004), "Valuing New South Wales Rivers for use in Benefit Transfer", *Australian Journal of Agricultural and Resource Economics*, 48(1): 591-612.

- detail appropriate valuation techniques, including their strengths, weaknesses and the circumstances in which they should be applied
- provide guidance in applying values (eg, to the assessment of potential projects and policies and the setting of regulatory requirements)
- provide a mechanism for setting consistent parameters, where appropriate
- consolidate all current information and estimates on the environmental costs and benefits of water and wastewater service provision in Sydney, and describe how these are being applied to decision-making
- be able to be updated as new information becomes available and approaches are reviewed.

These guidelines should be developed via an inter-agency approach, with coordination being the responsibility of a single agency. This will enable pooling of existing knowledge, while ensuring appropriate co-ordination. The agencies involved would be key regulators and stakeholders including DEC, DNR and IPART. DNR and DEC in particular have experience in valuing environmental impacts, primarily as part of their 'in-house' assessment of potential environmental policies and regulations. The guidelines should also draw on other national and international resources and, where applicable, similar guidelines developed in other jurisdictions and for other issues.

Recommendation 13

That the Government develop guidelines for valuing environmental impacts associated with the provision of water services in Sydney, and require that these guidelines be applied across all decision makers and government agencies (including the Department of Environment and Conservation, the Department of Natural Resources, IPART and Sydney Water).

6.5 A need for property rights for all water resources?

In its Draft Report, the Tribunal recommended that the Government establish property rights for sewage and stormwater, and consider establishing property rights for the injection and withdrawal of water from storage facilities such as natural aquifers.[100] This was on the basis that explicit property rights regimes for these resources (such as apply to specified sources of water under the *Water Management Act 2000*) would be required to encourage investment in innovative recycling schemes and ensure that these 'resources' were appropriately managed.

However, the Tribunal now believes that comprehensive property rights regimes for sewage and stormwater are not required. The development of such regimes would require significant policy work, and it is unlikely that the benefits of such work would justify its costs. This is because urban stormwater and sewage are not currently scarce resources (in many cases, they are still considered wastes to be disposed of or managed at minimal cost). In addition, under current 'rights' arrangements (see Box 6.3), potential investors in recycling schemes could gain access to stormwater and sewage and conceivably address any security of supply or 'investor certainty' concerns via agreement with the entity that has the 'right' to the resource (ie, local councils, water authorities, land owners or the Government –

100 Property rights are a bundle of entitlements that define the owner's right to the use of a resource or asset. For a market to be effective, property rights should be well specified, exclusive, transferable and enforceable.

depending on where harvesting is to occur). Arrangements between these entities (current 'rights' holders) and stormwater or sewage harvesters could also address potential 'downstream' or system impacts of extraction.

Chapter 2 discusses proposed arrangements for sewer mining, including the recommendation to formalise dispute resolution procedures. Below is a discussion of the importance of adequate catchment-wide stormwater planning, in the context of stormwater harvesting.

Box 6.3 The Tribunal's understanding of the current situation in terms of 'rights' to stormwater and sewage

Legislation does not confer ownership of water upon individuals or groups of individuals. For example, the *Water Management Act 2000* does not seek to confer ownership of water, rather it is concerned with rights of access to and use of water.

In terms of current arrangements for rights to access and use stormwater and sewage, the Tribunal has received the following advice:

- The owner of the property has the right to the rainwater that falls onto the land or flows over the land, before it reaches the boundaries of the land or flows into the stormwater pipes/channels.
- Once stormwater flows into the stormwater pipes/channels, it would seem that rights to the stormwater vest in the owner of these works (ie, Sydney Water or the relevant local council).
- Similarly, rights to sewage will depend on who owns the pipes through which the sewage is flowing. Sewage pipes transporting sewage from a dwelling to sewer mains are fixtures and so the private or public property owner will have a right to the sewage flowing through the pipes. Once sewage reaches the sewer mains, the relevant water authority (as owner of the mains) has rights to the sewage.
- Some stormwater and treated sewage is discharged into NSW's wetlands, creeks and rivers. If it is discharged into a wetland, creek or river, the stormwater or treated sewage comprises part of the State's water rights, pursuant to s.392 of the *Water Management Act.*
- The State of NSW has the right to inject water into an aquifer, the right to the control, use and flow of the water after it has been injected into an aquifer and the right to extract water from an aquifer (due to the operation of s.392 of the *Water Management Act 2000*).

6.5.1 Stormwater planning

While the Tribunal does not believe that it is necessary to subject urban stormwater to a comprehensive property rights regime, it is of the view that stormwater use should be subject to appropriate catchment-wide planning. This is because stormwater infrastructure can be under the control of more than one agency in a catchment (eg, several local councils and Sydney Water), thus requiring a degree of cooperation and coordination between these agencies. Furthermore, while stormwater capture and reuse would generally have a beneficial impact on the urban water cycle (in terms of reducing pollution and providing additional water for non-potable use, including environmental flows), there may be instances where large quantities of stormwater harvesting has unintended or detrimental impacts on downstream ecosystems or 'users'.

Such planning should recognise the integrated nature of the urban water cycle. It should also ensure that stormwater extraction is consistent with the Government's broader natural resource management and environmental objectives and that potential impacts on the

environment or other 'downstream' users are taken into account and suitably addressed. For example, in areas where stormwater flows along concrete channels straight into the ocean, it may be appropriate to place no restrictions on the overall level of stormwater extraction. In contrast, in areas where stormwater extraction could negatively affect downstream ecosystems (eg, where stormwater forms a significant component of flows to inland rivers), there may be a need to more stringently manage stormwater extraction (eg, to set harvesting limits or provide for compensating environmental flows from the dam).[101]

The Tribunal notes that stormwater in NSW is already subject to a planning regime, which could potentially be used to guide or manage stormwater harvesting. In 1998, as part of its Stormwater Trust Program, the Environment Protection Authority (EPA)[102] issued a legal direction under section 12 of the *Protection of the Environment Administration Act 1991* requiring councils to prepare stormwater management plans. The direction for councils in the Greater Metropolitan Region generally required the preparation of catchment-based plans on a co-operative basis. The primary purpose of these plans was to improve the health and quality of the State's urban waterways.[103] More recently, Catchment Management Authorities (CMAs) have been established to coordinate and implement management strategies to address key natural resources issues at the catchment level.[104] For CMAs within the greater Sydney region (the Sydney Metropolitan CMA and the Hawkesbury-Nepean CMA), this will involve a strong focus on stormwater management. The stormwater-related responsibilities of these CMAs are likely to include preparing a Catchment Action Plan (CAP), in consultation with local councils and State Government, which includes stormwater management objectives, plans and programs, and builds on the stormwater management plans prepared by local councils. The Tribunal also understands that State Government agencies such as DEC will continue to provide guidance and strategic support to CMAs and local councils in managing stormwater.

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101 According to the Hawkesbury-Nepean Catchment Management Authority, it is important to the health of the entire water cycle (and its effective management) that stormwater (and groundwater) harvesting is subject to the principles of sustainability and equity. (Submission to IPART, *Investigation into Water and Wastewater Service Provision in the Greater Sydney Region - Draft Report*, September 2005.)

102 The EPA is now part of the NSW Department of Environment and Conservation (DEC).

103 According to the EPA, they are to include management objectives, identification of management problems and issues, an implementation schedule for each organisation participating in the plan's preparation, a monitoring program to assess the effectiveness of the plan, and a program for revising the plan (www.environment.nsw.gov.au, October 2005).

104 From January 2004, CMAs were formally constituted as statutory authorities with their own staff, budgets and boards (under the *Catchment Management Authorities Act 2003*), to coordinate natural resource management in each catchment. CMA boards report directly to the Minister for Natural Resources (www.cma.nsw.gov.au, October 2005).

7 ENSURING CONTINUED PROTECTION OF CONSUMERS AND THE BROADER PUBLIC INTEREST

As set out in the Draft Report, implementation of the competitive reforms proposed by the Tribunal will require changes to the existing legal, regulatory and policy framework, to ensure that this framework continues to provide adequate protection to consumers and to the broader public interest. Even with a significant level of competition in the water industry, the Government will be responsible for providing this protection and ensuring the community's economic, social, health and environmental needs are met.

In its Draft Report, the Tribunal recommended that the following steps be taken to ensure this protection:

- the price of services to both small and large customers should continue to be regulated, and the need for this regulation should be reviewed when an open access framework is established and competition in the provision of services to customers emerges
- the legal and regulatory framework should be reviewed to ensure appropriate obligations are placed on incumbents and new entrants in relation to a range of non-price matters, including security of supply, water quality and public health, environmental impacts and customer contracts.

The Tribunal continues to support these recommendations, which are discussed in more detail below.

7.1 Continue to regulate prices

Price regulation is primarily intended to protect consumers from abuses of monopoly power and encourage efficiency by simulating the effects of competition. The introduction of competition to monopoly utility markets such as Sydney's current water and wastewater market generally reduces the need for it. However, State-owned water authorities will continue to have significant market power, even in the more dynamic market for water and wastewater services envisaged by the Tribunal. As a result, the Tribunal believes that price regulation will continue to be warranted in most areas. This is analogous to the telecommunications market where Telstra, despite having substantial rivals, continues to be subject to price regulation.

The Tribunal currently regulates prices for services provided by Government agencies that are declared monopoly services under the *Independent Pricing and Regulatory Tribunal of New South Wales Act 1992* (IPART Act). These services include water, wastewater, stormwater, trade waste and, in some circumstances, recycled water.

The Tribunal recommends that it continue to regulate prices for these services to *small* customers for the short to medium term, and to *large* customers for the immediate term. The need for this regulation should be reviewed if or when:

- an infrastructure access framework is established, competing service providers emerge and competition for large customers develops
- new services emerge for small customers, such that customers are freely able to choose the service on a commercial basis.

The current arrangements for recycled water prices are different to those for other services. Where recycled water is provided to large customers on a commercial basis, the prices are not subject to regulation. However, where recycled water services are provided to small customers on a mandatory basis the prices are regulated. The Tribunal considers that both these arrangements should continue to apply. If recycled water services to small customers are offered as part of a genuine commercial proposition, then it may be appropriate to adopt a lighter handed approach to price regulation. The Tribunal will examine these issues as part of its upcoming review of recycled water prices.

Under the existing legal and regulatory arrangements, the Tribunal regulates prices for water services provided by Government agencies only.[105] Consistent with the rationale for price regulation set out above, it believes that monopoly services provided by the private sector (for example, through an exclusive franchise) should also be subject to regulation. As the current statutory framework does not provide for price regulation of services provided by private sector firms, the legal basis for this would need to be established.

Recommendation 14

That the prices of water, wastewater and other related services to small customers continue to be regulated by IPART.

Recommendation 15

That where regulated services are not provided by a government agency, the legal basis for price regulation be established.

Recommendation 16

That the prices of water, wastewater and other related services to large customers continue to be regulated, but reviewed if an infrastructure access framework is established and competition for provision of services for large customers emerges.

7.2 Review the legal and regulatory framework to ensure incumbents and new entrants have appropriate obligations

In its Draft Report, the Tribunal posited that the status of water and wastewater services as essential services implies that the introduction of private sector participation into the market for these services gives rise to a range of concerns for consumers and for society in general. The Tribunal developed an indicative list of areas where additional protections may be warranted. These areas include:

- ensuring security of supply
- ensuring water quality and protection of public health
- managing environmental impacts
- developing, maintaining and extending water and sewerage services
- addressing the potential implications for customer contracts

105 See Section 11 of the *Independent Pricing and Regulatory Tribunal Act 1992*, which provides the Tribunal with a standing reference to conduct investigations and make reports to the Minister on the determination of the pricing for a government monopoly service supplied by a government agency specified in schedule 1 of the IPART Act.

- allocating responsibilities for coordinating and managing emergencies and matters of national security.

The Tribunal suggested that the Government will need to understand the potential impacts of the recommended competitive reforms on each of these areas, and adjust the legal and regulatory framework to ensure that appropriate obligations are placed on both incumbent providers and new entrants.

In its submission to the Draft Report, AGL noted that the Tribunal had not explicitly recommended that a licensing/authorisation regime be established.[106] The Tribunal believes that some form of licensing or authorisation regime will be the appropriate regulatory mechanism for specifying the rights and obligations of incumbents and new entrants. Design of a licensing and regulatory framework forms part of the Tribunal's recommended reform implementation plan set out in chapter 8. The Tribunal notes that design of such a regime could draw heavily on the current NSW water industry regulatory arrangements, the model proposed by the UK Government in introducing its competitive water reforms, and the experience of reform in the Australian energy markets.

The following sections set out some indicative examples of the issues that may be covered by the licensing or authorisation regime.

7.2.1 Ensuring security of supply

While the community understands and accepts the need for water restrictions in the event of drought, governments have overall responsibility for ensuring security of supply is managed within clearly defined parameters. Introducing open access to water and wastewater infrastructure raises the question of who should be accountable for matching the long-term demand for water with the available supply. Related questions include how should the failure of new entrants be dealt with, and whether customers who leave a new entrant should be entitled to be offered supply by the incumbent service provider.

Arrangements in England and Wales

In England and Wales, open access based competition in water services has been under consideration since the late 1990s. In this market, new arrangements in relation to security of supply have been developed to protect customers. These arrangements include:

- Each entrant is required to ensure that its inputs into the system and customer demands are matched. The incumbent operates the system in accordance with its overall network operating strategy.
- In some cases, the incumbent may need to control a new entrant's inputs in order to balance the network. This is acceptable, as long as supplies are not interrupted.
- The incumbent is responsible for any supply reliability problems that it causes (eg, through mechanical breakdown). New entrants must ensure that their water resources are sufficient to provide a sustainable supply to their customers. Backstop arrangements oblige the incumbent to supply all customers in its service area if requested.

106 AGL submission to IPART, *Investigation into Water and Wastewater Service Provision in the Greater Sydney Region - Draft Report*, September 2005, p 2.

Experience from other competitive utility sectors

Experience in other competitive utility sectors indicates that the introduction of an open access regime necessitates the allocation of clear 'backstop' responsibility for matching demand and supply in the event of inadequate investment by the market or to address any failure by a new entrant. It is also important to address the issue of 'free riding', which involves a new entrant making insufficient provision for drought conditions and thus obliging the Government to step in to protect customer interests, for example in the event of severe drought.

Experience indicates that establishing appropriate regulatory and pricing arrangements to ensure security of supply is likely to raise complex issues. These issues are also likely to be more complex for the water industry than for the electricity and gas industries, because of the uncertainties associated with drought and the high costs of managing drought risk.

Options

As set out in the Draft Report, there are several options for establishing 'backstop' responsibility for ensuring security of supply. One approach, which is used in competitive utility sectors such as electricity, is to manage this backstop responsibility centrally. One advantage of this approach is that it creates competitive neutrality between the incumbent and new entrants. However, it also creates the need for new organisational arrangements, and therefore can be complex.

Another approach is to impose 'security of supply' obligations on all market participants.[107] For example, in the Greater Sydney region, the separation of the bulk water supplier (the Catchment Authority) from the water retailer (Sydney Water) makes it possible to create tradeable Bulk Water Entitlements. Tranches of high security bulk entitlements to the Catchment Authority's storages could be established, and all participants could be obliged to hold a certain percentage of high security entitlement that matches their customer profile or pay a high penalty if they fail to do so. This approach would enable security of supply to be taken into account when trading in Bulk Water Entitlements.

A third approach may be possible following the construction of a desalination plant by the Government. It might then be appropriate for this plant to form the basis of 'security of supply' contracts between each participant and the party that has the rights to dispatch the desalination plant.

A fourth and simpler approach would be to allocate clear backstop security of supply responsibility to the incumbent water authority (Sydney Water). The incumbent would be responsible for providing services to all customers in its service area, including when a new entrants fails or customers choose to leave a new entrant. It should be entitled to recover reasonable costs for the provision of this service through access negotiation and arbitration.

Tribunal's suggested approach

The Tribunal retains the view that the fourth approach described above would be most suitable in establishing the initial open access arrangements for water and wastewater services. That is, a clear backstop security of supply responsibility should be allocated to the incumbent water authority.

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107 In gas and electricity in the United States, it is common to impose a security of supply obligation on individual players. In electricity, this is known as a "Capacity Obligation".

This approach is the same as the one adopted in England and Wales. Its main advantages are that it is relatively simple, and avoids any immediate requirement to establish new organisational arrangements. Given the lack of experience with open access regimes in the water and wastewater industry, and the current uncertainty about the demand for open access, it seems premature to consider establishing a more complicated arrangement. Further, provided the incumbent recovers reasonable costs for the provision of this service through the access negotiation and arbitration process, this approach guards against the risk of 'free riding'.

If there is clear evidence that there will be significant demand for open access and that it is likely to play a significant role, then security of supply responsibilities should be reviewed. This review should be undertaken in light of experience and changing circumstances (for example, decisions on a desalination plant) and should consider alternative approaches such as those noted above.

7.2.2 Ensuring water quality and protection of public health

In its Draft Report, the Tribunal noted that the establishment of more competitive arrangements may lead to the introduction of new water sources, the mixing of water of different qualities at different points of the water system, and an increase in the use of recycled water. This means that close attention will need to be paid to water quality, to ensure that public health is protected.

If there is a risk that poor quality water will enter the potable system and be delivered to customers, the legal and regulatory framework should be adjusted to ensure that:

- new entrants inject water that meets statutory standards
- there is clear accountability for ensuring that mixing of waters does not result in lower water quality for customers and is acceptable to customers
- new entrants bear the reasonable costs of prudent monitoring and sampling of the quality of water they inject into the incumbent service provider's network
- the respective liability of incumbent providers and new entrants are clear. (For example, in England and Wales, incumbents bear primary responsibility for the quality of water supplied. To the extent that a new entrant injects water that gives rise to problems, the access contract should include appropriate penalties.)

7.2.3 Managing environmental impacts

The overall regulatory framework for the water industry should support future decisions and trade-offs made by Government in relation to the environment, and oblige all service providers to give effect to the Government's environmental decisions. It is also important that the regulatory framework recognises the integrated nature of the water cycle and the environmental impacts of water services; and that regulatory agencies adopt a coordinated approach to environmental issues.

In its submission to the Draft Report, the Hawkesbury-Nepean Catchment Management Authority argued that the Tribunal needs to address the dichotomy between economic efficiency and sustainability, and that a basic river health recommendation should be part of

the Tribunal's suite of recommendations to Government.[108] Chapter 6 discussed the need to ensure that environmental impacts are adequately accounted for and factored into decision-making. The Tribunal suggests that the specific issues raised by the Hawkesbury-Nepean Catchment Management Authority are best addressed through the Government's Metropolitan Water Plan, any water sharing plan for the Hawkesbury-Nepean issued under the *Water Management Act 2000*, and the Department of Environment and Conservation's (DEC) regulatory instruments.

7.2.4 Developing, maintaining and extending water and sewerage services

Currently, Sydney Water (as provider of the existing water infrastructure) has 'public benefit' regulatory obligations in relation to system planning and operation. Decisions will need to be made about whether these obligations should continue when new retailers enter the market, or whether they will be limited to contractual obligations to new entrant retailers.

7.2.5 Addressing potential effects on customer contracts

The experience of competitive reform in the Australian energy sector suggests that the introduction of competition has some potential implications for customer contracts that will need to be considered and addressed. For example:

- Customers and water companies will need to understand the direct implications for them of changed contractual arrangements and risk allocations. For instance, where competition allows a customer to change retailer, are there any continuing rights and obligations owed directly between the customer and network company in relation to asset maintenance and access?
- How are the costs for any 'public benefit' obligations allocated and recovered?
- Should a supplier of last resort scheme be established, given that water and wastewater services are essential?

7.2.6 Allocating responsibility for managing emergencies and national security matters

In energy reforms, and in UK water reforms, it has been necessary to create additional regulatory and contractual obligations to allocate primary responsibility for co-ordinating and managing emergencies, and to require new entrants to co-operate, provide information and participate in emergency planning and co-ordination exercises.

108 Hawkesbury-Nepean Management Authority submission to IPART, *Investigation into Water and Wastewater Service Provision in the Greater Sydney Region – Draft Report,* October 2005.

Recommendation 17

That the Government ensure appropriate regulatory obligations are placed on incumbents and new entrants through a licensing or authorisation regime to protect consumers and the public interest in relation to ensuring security of supply, ensuring water quality and protection of public health, managing environmental impacts, developing, maintaining and extending water and sewerage services, addressing potential effects on customer contracts, and allocating responsibility for managing emergencies and national security matters.

8 IMPLEMENTING REGULATORY CHANGE AND REFORM – THE NEXT STEPS

The Tribunal considered several possible approaches for implementing the regulatory changes required as a result of its proposed reforms. It believes that an 'adaptive management' approach is likely to be most effective, given the specific context of Sydney's water and wastewater industry. Under an adaptive management approach, the first step would be to establish a set of basic principles and features for the revised regulatory framework, and use the principles to guide and direct short-term decisions made under the existing framework. The next step would be to use the principles and features to guide a review of the existing framework and the subsequent development a revised regulatory framework that is robust, flexible and overarching.

The following sections describe the Tribunal's recommended approach to implementing regulatory change, and its recommended principles and features for a robust and flexible revised regulatory regime.

Experience of competitive reform in other industries suggests that the effectiveness of this type of reform depends significantly on the approach to implementation. For instance, establishing clear commitments and timelines for change can minimise the risks of regulatory uncertainty, stifled innovation and investment, or inappropriate investment and risk allocation. The Tribunal's recommended approach to implementing reform, including its proposed initial Reform Implementation Plan, is discussed in detail below.

8.1 Adaptive management approach to regulatory change

As set out in the Draft Report, the Tribunal identified three possible approaches that could be taken to implement its recommended regulatory changes. The first is to undertake piecemeal, ad hoc amendments to the existing regulatory framework, to facilitate individual developments on a case-by-case basis. The second is to conduct a rigorous review of the overarching legal and regulatory framework, and defer all decisions until comprehensive reforms are completed. The third is to apply an adaptive management approach by first establishing the basic principles and features of the revised legal and regulatory framework, then:

- using the principles to guide short-term decisions on the water and wastewater industry made under the existing framework
- using the principles and features to guide and direct a comprehensive review of the existing framework and the subsequent development of a robust and flexible revised framework.

The Tribunal considered each of these options. In relation to the first approach, it found that implementing regulatory changes in a piecemeal way, using successive 'add-ons' to specific areas of the regulatory framework would pose significant risks – particularly as the regulatory framework for water management in Sydney is complex, and involves several ministerial portfolios spanning health, safety, planning, the environment, economic regulation and shareholder interests.

Accommodating new players and activities through add-ons to the existing framework would present real challenges in ensuring that changes do not create new conflicts, or work at cross-purposes, omit important links or requirements, or result in inefficient duplication. In addition, ad hoc changes that increase complexity or ambiguity can create additional public costs and risks, and the Government, rather than the private sector, will be required to take measures to address these risks. The potential costs include inefficient regulation, regulatory uncertainty, stifled innovation, stifled or inappropriate investment, or inappropriate risk allocation.

In relation to the second option – conducting a rigorous review and deferring all decisions until comprehensive reforms are complete – the Tribunal found that this approach would not provide guidance for necessary short-term decisions about the water and wastewater industry—such as decisions about desalination or the new growth areas. This creates the risk that decisions made in the short term will be inconsistent with the revised regulatory arrangements when they are complete. This inconsistency may lead or contribute to:

- failure or reduced ability to achieve the objectives of efficiency, effectiveness and sustainability
- distortions, conflicts or inequities between current and future industry participants
- investor confusion or lack of confidence
- customer inequities and differences in pricing
- process inefficiency (duplication, inconsistency, compliance complexity or costs)
- long-term contracts that cannot be accommodated readily within revised regulatory arrangements or that could undermine water objectives.

New players are already entering the water and wastewater market. Desirable regulatory amendments may not be in place when decisions are made and investments committed. In addition to the risks outlined above, the Tribunal notes that changing regulatory obligations or risk allocation *after* private sector involvement can be more complex and problematic, especially where changes affect private sector interests and rights. Those risks can be mitigated by a clear advance indication from Government of the nature of proposed changes. (Although the Tribunal does recognise that Government policy can change and that therefore there may be some instances where it is appropriate or unavoidable for regulatory requirements to change *after* private sector involvement.)

For all of the above reasons, the Tribunal believes that the third option, applying an adaptive management approach to regulatory change, will be the most effective.[109] This approach will allow the Government to send directional signals on the legal and regulatory framework as soon as possible, which is important for the long-term coherence and effectiveness of industry arrangements. These signals, or regulatory principles, should inform private sector participants and, in the short term, provide an overarching guide to decision-makers in Government agencies, pending finalisation of reforms. An adaptive management approach will also allow the Government to define the key features and characteristics of the future regulatory framework in a relatively short time. Along with the following principles, these

[109] Sydney Water supports "a gradual approach for progressing implementation of reforms". (See Sydney Water Corporation submission to IPART, *Investigation into Water and Wastewater Service Provision in the Greater Sydney Region – Draft Report*, September 2005, p 5.)

features should be used to guide and direct a review of the existing framework and the subsequent development of the revised framework.

8.2 Principles and features of a robust and flexible regulatory framework

In its Draft Report, the Tribunal considered what basic principles should be used to guide short-term decision making in relation to the regulation of new private or public sector entrants and activities in Sydney's water and wastewater industry, and guide the review and development of the revised regulatory framework. It also considered what additional principles, features and characteristics should guide the development of revised regulatory framework. The Australian Council for Infrastructure Development (AusCID) broadly supported these principles.[110]

8.2.1 Basic principles

The Tribunal reviewed Government objectives, recent experience in the reform of the United Kingdom's water industry and experience in the reform of Australia's energy sector. Based on this review, it developed a set of basic principles aimed at supporting competitive neutrality, protecting the public interest and promoting regulatory efficiency. These principles are that:

- *No service provider or activity should have an adverse impact on public health, safety or the environment.*
- *No service provider or activity should have an adverse impact on the overall integrity of water or waste water systems, system operation, or security of supply.*
- *Risks should be identified and managed effectively.*
- *All regulated entities should be subject to the same transparent rules, regulations and policy objectives.*
- *The above principles should apply unless there are sound public policy reasons to the contrary.*

Recommendation 18

That the Government adopts the Tribunal's suggested basic principles for the revised policy and regulatory framework, and use those principles to guide and direct:

- ***short-term decisions in the water and wastewater industry made under the existing framework***
- ***a comprehensive review of the existing framework and subsequent development of the revised regulatory framework.***

8.2.2 Additional principles, features and characteristics

The Tribunal believes that, in addition to the principles above, the review and development of the revised regulatory framework should be guided and directed by the accepted principles of best practice regulation (transparency, accountability, targeted regulation, consistency, and proportionate regulation), the National Competition Reform principles, and

110 AusCID submission to IPART, *Investigation into Water and Wastewater Service Provision in the Greater Sydney Region - Draft Report*, October 2005.

a range of desirable features and characteristics. These specific features and characteristics include:

- consistent application through the State
- clear principles for decision makers
- flexibility and adaptability to apply readily to any new entrant (regulating activities, rather than named persons)
- seamless application to all activities and functions and
- exceptions or exemptions in the public interest.

Recommendation 19

That the Government, in reviewing the existing framework and developing the revised legal regulatory framework, also take into account:

- ***principles of best practice regulation***
- ***national competition reform principles***
- ***desirable features and characteristics such as consistent application throughout the state; clear principles for decision-makers; flexibility and adaptability to apply readily to any new entrant; seamless application to all activities and functions; and provision for exceptions that are in the public interest.***

8.3 Reform implementation

In its Draft Report, the Tribunal argued that a well-managed and effective implementation process would involve:

- co-ordinating key participants in the water industry, reviewing reform proposals before they are put to government, and monitoring the progress of implementation
- ensuring that the implementation decision-making processes are open, transparent and effectively manage vested-interest positions
- establishing a central agency unit that is responsible for managing and driving the reform process, and is accountable to a Cabinet Committee
- preparing a reform implementation plan, which addresses issues such as the sequencing of reform, and which should be reviewed and updated by the central agency unit as appropriate.

Each of these matters is discussed in more detail below.

8.3.1 Co-ordination, review and monitoring

As part of an effective process, the implementation of the Tribunal's recommended reforms should involve the co-ordination of Government agencies and industry players to carry out a range of tasks, the review of reform proposals before they are formally recommended to Government, and monitoring of the progress of implementation.

Coordination responsibilities would include:

- facilitating Government decisions on the appropriate prioritisation and sequencing of implementation steps and decisions
- identifying responsibilities, accountabilities and resource implications for undertaking various implementation tasks, and
- establishing timelines and deadlines for decision making.

Review responsibilities in relation to the new legislative and regulatory arrangements would include:

- ensuring that appropriate consultation and communication occurs with industry, stakeholders and the community
- considering whether various detailed proposals are sufficiently robust and whether further work or expert review is required
- ensuring that work is undertaken to identify and develop appropriate responses (and obligations) to manage operational impacts of new developments.

Monitoring of progress would include:

- reporting to Government on progress against implementation timelines
- identifying and facilitating resolution of difficult issues and problems
- anticipating and addressing implementation delays.

8.3.2 Open, transparent and independent decision-making

Implementation decision-making processes need to be open and transparent, particularly with the introduction of private sector industry participants.

Regulatory obligations will need to be imposed on new industry participants, and the responsible agencies need to work closely with the private sector participants to ensure the effectiveness of detailed implementation of these obligations. Private sector participants have a legitimate interest in being involved in commenting on the details of the new arrangements.

Decision making also needs to be balanced and independent, and guard against 'capture' by the vested interests of either incumbents or new entrants.

8.3.3 A central agency unit to implement reform

Currently, Sydney Water and the Catchment Authority are the two main players in the Greater Sydney metropolitan water industry, although a Growth Centres Commission water authority may evolve to become another significant player. In addition, a range of

Government bodies are involved in providing policy advice and regulating the water industry. These include IPART, the Department of Energy, Utilities and Sustainability (DEUS), Department of Natural Resources (DNR), Department of Environment and Conservation (DEC) and NSW Health. Treasury, The Cabinet Office and Parliamentary Counsel would also be involved in any decisions about regulatory reform.

Implementation could be carried out through cooperation between the various bodies. However, the Tribunal considers there is a significant risk that this option would result in:

- a lack of clear accountabilities for driving the reform process
- insufficiently open and transparent decision making
- a perceived (or real) lack of balance and independence in decision making.

In its submission to the Draft Report, Sydney Water suggested that "specific implementation arrangements would depend on the kind of changes determined by Government".[111] The Tribunal believes that the magnitude of the reforms envisaged suggests that a better option is for the Government to assign responsibility for implementation to a central agency unit reporting to a Cabinet Committee. Experience in implementing reforms in other jurisdictions and industries indicates that there are real benefits in establishing a central agency unit to coordinate implementation (see Box 8.1).

Box 8.1 Experience in implementing reforms

Electricity

Electricity sector reform was complex, but is widely considered to be successful. All State governments (including NSW) have at different times established central agency responsibilities to coordinate electricity reform programs. An important benefit of this approach was that it:

- facilitated clear accountability for driving reform
- enabled implementation decision-making to more effectively draw on the limited available industry expertise – for example, through secondments of industry experts to the central agency and the establishment of industry committees and working groups.

National Water Reform

The Commonwealth and State Governments recently established the National Water Commission (an independent statutory body in the Prime Minister's portfolio) whose role is to "drive the national water reform agenda". While it is too early to determine the success of the National Water Commission, it illustrates that there are perceived advantages of establishing a central reform coordination and leadership organisation that does not have 'line' responsibilities in day-to-day policy advice, regulation or service delivery.

The Tribunal envisages that the agency unit would be staffed by a mix of personnel with relevant general experience and seconded staff with appropriate water industry expertise, supported by consultants where appropriate. The unit would be accountable for co-ordinating the implementation program and reviewing and monitoring progress over the specific timeframe envisaged for reform implementation. While reform of the industry is itself likely to be a significant task, the key responsibility of the unit would be to give the reform momentum, through its co-ordination. While this is a very important role, it may not

111 Sydney Water Corporation's submission to IPART, *Investigation into Water and Wastewater Service Provision in the Greater Sydney Region - Draft Report*, September 2005, p 5.

in itself require a large amount of resources. Rather, the bulk of the detailed development work would be allocated to the relevant (or appropriate) lead agencies and water bodies.

Recommendation 20

That the Government establish a central agency unit, which will report to a Cabinet Committee and be accountable for co-ordinating implementation of reform and reviewing and monitoring progress.

8.3.4 Reform implementation plan

In its Draft Report, the Tribunal suggested that if the Government decides to accept (or substantially accept) the Tribunal's recommendations, the Tribunal believes that the next step is to prepare a *Water and Wastewater Service Reform Implementation Plan for the Greater Sydney Region* (Reform Implementation Plan). This plan would form the basis of the reform implementation management arrangements discussed above. The central co-ordination unit (discussed above) would then progressively review and update the Reform Implementation Plan, as appropriate.

A range of factors would need to be addressed in developing this plan, including the following:

- The key components of the recommendations accepted by Government should be 'locked in' as soon as possible. A clear, shared vision and committed timeline for changes can minimise the risks of regulatory uncertainty, stifled innovation, stifled or inappropriate investment, or inappropriate risk allocation.
- If the Government wishes to consider particular areas further, then these should also be clearly identified. As decisions are made, the strategy vision should be progressively clarified.
- Implementation should proceed in accordance with a pragmatic approach and timetable that recognises the magnitude of potential improvements that may be gained, the relative ease of effecting change, and a logical sequencing of decisions.

The Tribunal has prepared an outline for the Reform Implementation Plan covering a two-year period (see over page), and suggested a lead agency for each phase of the detailed development work. The Tribunal recommends that this outline form the basis of a detailed Reform Implementation Plan.

The Tribunal's outline envisages the following reform milestones:

After 6 months

- Activities suitable for competitive sourcing and existing institutional, organisational and legislative barriers have been identified
- Activities requiring licensing/authorisation, form and scope of regulation, and existing legislative impediments and required amendments have been identified
- Draft access regime and detailed access implementation plan have been prepared

After 12 months

- Competitive sourcing policy has been prepared and institutional, organisational and legislative barriers have been corrected

- Legislative amendments to implement chosen licensing/authorisation regime have been made and regime implemented
- Access regime finalised and implemented, including any regulatory principles

After 24 months

- Efficacy of competitive sourcing arrangements reviewed
- Supporting arrangements for licensing/authorisation regime have been developed
- Interim review of access regime completed (including pricing principles) and supporting arrangements developed

Recommendation 21

That the Government develop a detailed reform implementation plan, building on the Tribunal's proposed outline, that includes a clear vision for reform, an outline of the immediate next steps and appropriate sequencing for subsequent areas of work.

Recommendation 22

That the Government progress implementation in accordance with a pragmatic approach and timetable that recognises the magnitude of potential improvements that may be gained, the relative ease of effecting change, and a logical sequencing of decisions.

OUTLINE FOR REFORM IMPLEMENTATION PLAN

Recommendation	Immediate term (0-6 months)	Medium term (0-12 months)	Long term (0-24 months)
Competitive sourcing (Rec 1, 3 & 4)	• Establish implementation group • Develop timelines for implementation • Identify activities suitable for competitive sourcing and procurement • Assess delivery risks Proposed lead agencies: The Cabinet Office or DEUS in consultation with Sydney Water • Identify institutional and organisational barriers • Identify deficiencies or impediments in current legislation (including in relation to access to water sources and licensing) • Review tendering and contracting processes Proposed lead agency: IPART	• Develop competitive sourcing policy • Undertake structural separation of competitive sourcing activities from other activities • Develop tools and methodologies to measure outcomes and evaluation processes that enable comparison of alternatives • Develop internal skills and expertise • Adapt and where necessary modify tenders and contracts Proposed lead agency: The Cabinet Office or DEUS in consultation with Sydney Water • Correct deficiencies or impediments in current legislation (including in relation to access to water sources and licensing) Proposed lead agency for implementing legislative change: The Cabinet Office or DEUS	• Identify longer term service outcomes • Assess efficacy of outcomes • Develop tools for long term planning and assessment Proposed lead agency: The Cabinet Office or DEUS in consultation with Sydney Water • Review operation of access and licensing legislation Proposed lead agency: IPART

Recommendation	Immediate term (0-6 months)	Medium term (0-12 months)	Long term (0-24 months)
Licensing and regulatory framework (Rec 2, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19)	• Identify activities relating to health, safety, security, reliability and the environment that require regulation • Identify form of regulation – whether licensing or regulation through subordinate legislation (such as guidelines or rules) – and relationship with existing water operating licences • Identify necessary legislative amendments to implement chosen form of regulation • Identify scope of regulation for each activity (extent of regulation may vary according to the class of end-use customer) • Identify and address competitive neutrality issues • Identify options for formalising dispute resolution procedures for sewer mining Proposed lead agency: IPART	• Make legislative amendments necessary to implement chosen form of regulation • Implement chosen form of regulation for activities where no or minimal customer interface is involved • Implement chosen form of formalising dispute resolution procedures for sewer mining Proposed lead agency for implementing legislative change: The Cabinet Office or DEUS.	• Implement chosen form of regulation for activities where customer interface is involved. This may include matters such as customer transfer systems. • Develop industry codes of practice where necessary Proposed lead agency: The Cabinet Office or DEUS

Recommendation	Immediate term (0-6 months)	Medium term (0-12 months)	Long term (0-24 months)
State access regime (Rec 5, 6, 7)	• Establish implementation group • Confer with the National Competition Council • Identify models for a legislative or non-legislative access regime • Identify natural monopoly infrastructure • Identify legal and regulatory impediments to third party access • Undertake survey of existing licensing obligations • Identify appropriate role and functions of regulator • Identify options for resolution of access disputes, reviews and appeals • Commence drafting of state access regime • Prepare implementation plan for introducing third party access • Identify agency responsibility for on-going policy development • Recruitment or secondment of suitably qualified personnel to policy body Proposed lead agency: IPART	• Finalise regime in consultation with National Competition Council outstanding criteria for an effective state access regime • Specify or provide model for specifying declared assets • Draft amendments to regulatory and licensing regime sufficient to give effect to State access regime • Complete drafting of access regime • Draft dispute resolution and appeals procedures • Develop pricing principles • Commence drafting of interpretation guidelines Proposed lead agency: IPART • Establish and confer functions on regulator • Apply for 'certification' of the regime Proposed lead agency for implementing legislative change: The Cabinet Office or DEUS	• Finalise implementation guidelines • Review pricing principles • Undertake interim review of operation of regime and where necessary identify areas of reform • Complete drafting of all ancillary and supplementary legislative and licensing provisions to support third party competition Proposed lead agency: IPART

APPENDIX A TERMS OF REFERENCE

Sydney Water Corporation is the statutory State-owned corporation responsible for delivering water and wastewater services to customers in Sydney, the Blue Mountains and the Illawarra. Since corporatisation, Sydney Water has made significant efficiency gains, leading to lower prices for its customers. At the same time, Sydney's demand for water now exceeds the sustainable yield of its catchment. The Government has developed the Metropolitan Water Plan which outlines a mix of actions which will deliver a long-term balance between supply of and demand for water. A key element of the Plan is encouraging the involvement of the private sector in developing innovative solutions to Sydney's water problems. These developments have important implications for the pricing of water and wastewater and for the structure of the water and wastewater services industry.

1) The Independent Pricing and Regulatory Tribunal (IPART) is requested, under section 9 of the *Independent Pricing and Regulatory Tribunal Act 1992,* to investigate and provide advice on possible pricing principles and alternative arrangements, including possible private sector involvement, for the delivery of water and wastewater services in the greater Sydney metropolitan area, with a view to making recommendations for providing these services in the most efficient, effective and sustainable way.

2) In conducting the review and developing recommendations, IPART is to

   I. Have regard to:

      i. The principles of integrated water cycle management;
      ii. The roles and responsibilities of participants in the industry, both Government and private sector;
      iii. Approaches taken in other jurisdictions to the pricing and delivery of water and wastewater services;
      iv. Recent reforms in other industries with similar characteristics;
      v. The costs and benefits of alternative industry structures, including transitional costs that may be incurred in changing to a new structure;
      vi. The principles for pricing, including pricing for recycled water, that should be associated with existing and alternative industry structures;
      vii. The principles for access that should be associated with alternative industry structures;
      viii. Mechanisms for implementation of the pricing and access principles;
      ix. Any impacts (including service provision, operational or financial impacts) on existing asset owners and operators;
      x. Any impact on customers and in particular any differential impact on large families or low income households, and how these may be addressed;
      xi. Any impact on human health; and
      xii. Any impact on the environment.

   II. Consult with Government, the water and wastewater industry, water and wastewater customers, and other interested parties.

3) IPART is to provide a final report to the Minister for Energy and Utilities within 9 months of receipt of these Terms of Reference.

APPENDIX B EFFICIENCY, COMPETITION AND UNBUNDLING

In general, the experience in other jurisdictions suggests that, where it is feasible, competition encourages efficiency and innovation, and is preferable to regulation. In evaluating the various options for the structure of the water and wastewater industry in Greater Sydney, the Tribunal has considered the trade-off between the productive efficiency that can result from the economies of scale and scope associated with one vertically integrated service provider, and the dynamic and productive efficiency gains that can be achieved through increased competition (net of any transaction costs and transition costs). Box B.1 below explains these concepts.

The starting point for determining the potential for extending competition to different components of the water and wastewater system is to analyse the functional elements of the entire water supply service to determine which are competitive and which are natural monopolies. Box B.2 provides a preliminary discussion of the competitive and monopoly elements of Sydney's water and wastewater service.

Under third-party access, a new entrant shares access to those facilities in the supply chain exhibiting natural monopoly characteristics, while competing in the areas that are potentially competitive. The notion of third-party access underpins the reforms observed in electricity and gas industries in many jurisdictions (including Australia, the UK and North America). In general, third-party access has been introduced to enable large customers to choose their supplier, with arrangements often being extended to smaller customers once they have been found to be working effectively.

Progressive unbundling of the activities of an incumbent, vertically integrated service provider has been a feature of many industry reforms. That is, to maximise the benefits associated with competition, recent reforms to energy, transport and other utility industries in jurisdictions around the world have separated potentially competitive sectors from natural monopoly elements. The extent of unbundling has ranged from accounting separation through to full legal separation or divestment.

Box B.1 The role of industry reform and competition

According to economic theory there are three types of efficiency – technical or productive efficiency, allocative efficiency and dynamic efficiency.

Productive efficiency is said to be achieved when a given output is produced at minimum possible cost, given the available production technology and input prices. This type of efficiency is relevant to the goal of delivering water and wastewater services at the lowest possible cost to the consumer. Competition, where feasible, is one means by which firms can be forced to produce and price goods and services at the least possible cost to consumers. Incentive-based regulation is another means for encouraging productive efficiency for services provided by a monopoly business.

Allocative efficiency is maximised where resources are allocated so that the value in the use of the product at the margin is equal to the increment in the cost of supplying the product at the margin, including any external costs and benefits from the activity. The necessary rule can be summarised as the application of marginal cost pricing. Competition, where feasible, is one means of encouraging allocative efficiency, as firms that can use resources more productively bid them away from others. Allocative efficiency for monopoly services can be encouraged through the process of setting regulated pricing structures.

Dynamic efficiency relates to processes of technological and managerial innovation – the ability of producers to improve the quality and cost of their goods and services and to respond to emerging market developments. Such efficiency gains are particularly attractive when dealing with an increasingly scarce and valuable resource such as water. Removing artificial regulatory barriers to entry may be important in promoting the investigation and commercialisation of new water sources, or the more efficient use of current water stocks including water conservation.

Competition is not an end in itself – it is merely a means to the end of increasing consumer welfare. For some activities, which are generally characterised as natural monopolies,[112] it is not appropriate or possible to introduce competition. When competition is not feasible, or is not considered worthwhile, then effective regulatory and institutional arrangements for protecting the interests of customers and promoting efficiency need to be established. Experience in other network industries indicates that competition is a matter of degree, varying in extent from industry to industry.

The estimated benefits from introducing competition should be compared to the costs of its implementation. These implementation costs fall into two categories – the costs of transition to the new arrangements and the increase in transaction costs associated with an increased number of market participants. The term 'transaction cost' refers to the cost of providing for some good or service through a market (ie, a number of firms offering the good or service) rather than having it provided by one firm. (In order to carry out a market transaction it is necessary to discover who it is that one wishes to deal with, to conduct negotiations leading up to a bargain, to draw up the contract and to undertake the inspection needed to make sure that the terms of the contract are being observed.)

If a decision is taken to introduce greater competition for certain functions involved in water service delivery, the most important requirement would be to establish an environment where competition can take place. It is difficult to predict the extent to which competition may develop and the extent of efficiency benefits that will arise. The emphasis should be on creating a transparent and predictable environment, which separates the potentially competitive components of the industry.

112 Natural monopolies occur when the market is served most cheaply by a single firm rather than a number of competing firms and are characterised by economies of scale, which means that unit costs decline throughout the relevant range of production as output increases. They can also be characterised by economies of scope, which means that it is cheaper for one firm to provide two or more related products and services together, than for each of them to be provided by a separate firm. Economies of scope typically arise from the use of common assets to produce separate products (eg, cable television networks delivering both broadcast entertainment services and telecommunications services, utilising much of the same infrastructure). Significant sunk costs are also a feature of natural monopolies. These costs cannot be recovered if an entrant leaves the market. They also act as a barrier to entry.

Box B.2 Identifying the competitive and monopoly functional elements of Sydney's water and wastewater service

Water services

Water storage and harvesting

The creation of the Catchment Authority in 1998 separated water storage and harvesting from the means of transporting and distributing it. There is potential for some competition within this element. A single buyer could secure supply from the Catchment Authority, and possibly also obtain bulk water from other sources via desalination, groundwater or recycling - depending on the viability of these alternative sources.

Water treatment

Water treatment could be natural monopoly in a small market that is at a distance from other markets, but is likely to be competitive as the size and density of the market increases.

Water transportation

Water transportation (which involves two separate roles - water transport and system operation) appears to be characterised by natural monopoly. Given the economies of scale and scope associated with infrastructure networks, it is generally cheaper for water to be transported by a single transmission and distribution system rather than by two or more competing alternatives. This is also true in other utility industries (eg, energy and rail); however, unlike these other industries the costs (and prices) associated with the transport component of water and sewerage services in Sydney have not been disclosed separately from the retail component (the commodity component is the price paid by Sydney Water to the Catchment Authority).

Retail services

The retail component involves two roles – planning and risk management associated with procuring supply of the service, and all aspects of the customer interface (metering, billing and customer service). Sydney Water currently provides retailing services for all customers in the greater Sydney metropolitan area, and these are priced and sold to customers as a bundled service with the transport and bulk water components. It is possible that the emergence of multi-utility retailers providing energy and telecommunications retail services will lead to interest from potential new entrants wanting to offer retail water services.

Sewerage services

Sewage transportation

Like the water distribution network, the piped sewerage network exhibits natural monopoly characteristics.

Retail services

The arrangements for sewerage service retailing are similar to those for water services, with the additional function of effluent testing and strength measurement (particularly for the trade waste sector). Again, in common with water, the financial unbundling of the transport and treatment components from the retail component is fundamental to the development of competition. Introducing competition in retail services also has associated costs, requires the introduction of supplier-of-last-resort arrangements and increases transactions costs in the industry.

Wastewater treatment and disposal

For sewage treatment and disposal, there may be potential for the emergence of effective competition in treatment facilities (eg, small scale, on-site treatment plants for industrial users). Alternatively, it may be desirable for Sydney Water to offer an unbundled, tariff-based service to all potential treatment plant users.

APPENDIX C FACILITATING OPEN ACCESS

The Tribunal has undertaken preliminary work identifying the items that access arrangements may cover. These include technical and operational issues, requirements regarding data exchange, and legal and general items. Specific issues associated with access to Sydney Water's water and wastewater networks have also been identified. These are discussed in turn below.

Access arrangements

Having reviewed access arrangements in other industries and the approach taken to water network access in England and Wales, the Tribunal anticipates that access arrangements would at least need to cover the following items:

Purpose

- Defining the nature of the service(s) to be provided by access provider and the responsibilities and obligations of both access provider and access seeker.

Technical issues

- For water, quality (possibly including aesthetic parameters) and pressure requirements at injection point(s) (entry points) and off-take point(s) (exit points) and average and peak flow rates.
- For wastewater, composition at injection points.
- Monitoring requirements: measurement of volume (possibly at both injection and off-take), and for water, measurement of quality, pressure and flow; access to data.
- Measurement equipment: verification, maintenance, procedures for estimation of meter readings where necessary, procedures for addressing disputes over measurement.
- Measurement requirements for calculating access charges.
- Information requirements for system planning.
- Required asset performance and arrangements for reviewing asset performance.
- Procedures for agreeing scheduled or planed maintenance, including notification, and arrangements applying in event of interruption ("unplanned" maintenance) or reduced service, including notification and compensation.

Operation

- Emergency measures and procedures and incident management to address health and safety issues and/or risks to supply system integrity (including relating to injection of "off-specification" water and fire fighting), including notification of access seekers' customers.
- Management of temporary supply shortages or congestion.

Data requirements

- Supply and demand data (estimation and actual notification).
- Injection and off-take location.
- Relevant customer data (including special requirements eg, medical, industrial).

Legal and General

- Duration of agreement.
- Modifications to agreement.
- Suspension and termination of agreement, including definition of default and breach.
- Assignment.
- Subcontracting.
- Liabilities and indemnities.
- Compensation.
- Delivery of water and wastewater: title and risk.
- Insurance and financial guarantees.
- Force majeure.
- Credit requirements.
- Invoicing and payment (including procedure in event of non-payment).
- Dispute resolution.
- Notices and communication.
- Confidentiality and data protection.

It is likely that access providers would be required to not unduly discriminate when granting access; differential treatment between service providers would need to be objectively justified on legitimate grounds. An access application procedure would need to be specified, with appropriate specification of the steps in the application process, information requirements (including confidentiality), a provisional timeframe for the application process and (possibly) applicable fees.

The Tribunal expects that access seekers would want to mirror any applicable service standards in access agreements (eg, standards relating to customers' water pressure, continuity of water supply and sewer overflows). If these are different to the service standards provided by the access provider to its own customers, a charge for this could be calculated on a commercial basis.

Arrangements would need to be established to facilitate the transfer (or switching) of customers eligible for access based competition from one water and/or wastewater service provider to another (including arrangements relating to customers' outstanding debt and the addition of new customers[113]). While an access seeker would be responsible for the billing of

[113] This include both "new" customers, and customers who become eligible for access based competition (ie as per the definition of the customer eligibility threshold).

its customers, this service may be provided by the access provider on its behalf on a commercial basis. A similar arrangement may apply for customer contacts, including complaints. In the case of customer complaints, there would need to be an agreed procedure for allocating and transferring complaints between the access provider and the access seeker. Other activities that may be contracted out by the access seeker (potentially to the access provider) include meter reading and maintenance.

While there will be an agreement between a customer and a new supplier (access seeker), there may be a requirement for a connection agreement between a customer and the access provider. This would be the case if a contractual arrangement needed to be established between the customer and the access provider (possibly through a tri-partite agreement involving the access seeker), to entrench particular rights and obligations regarding connection to the network.

As set out above, the legal and regulatory framework should be reviewed to ensure appropriate obligations are placed on incumbents and new entrants in relation to matters including price, security of supply, water quality, environmental impacts and customer contracts. The Tribunal anticipates that, as well as being bound by the terms of access agreements, access seekers and providers would be regulated through a licensing/authorisation regime.

Access to the water network

The Draft Report concluded that incumbent service providers should be responsible for issues associated with security of supply (including drought and supply/demand balance planning). Access seekers would be required to provide relevant information to incumbents for the purpose of managing security of supply, for example by supplying a risk assessment of proposed potable water sources, including an assessment of exposure to pollution or contamination incidents, vandalism, changes in yield (or supply source reliability) and other risks. Access agreements may specify water resource reliability and drought protection requirements. In the event of water restrictions, access agreements would need to specify whether supply restrictions would apply to all customers equally, or on the basis of supply source reliability.[114]

Sydney Water has indicated that there is sufficient storage in the water network to avoid the need for specific system balancing arrangements. In England and Wales, Ofwat's guidance on access codes[115] anticipates case-specific arrangements to deal with water flow balancing. In this instance, some or all of the following information would be provided under access agreements:

- Forecasts of supply and demand, including planned outages and maintenance.
- Notification of deviation from forecasts.
- A requirement for an access seeker to introduce a volume of water, equivalent to its customers' exact demand, into the access provider's system at agreed intervals and disregarding the customer's actual consumption.

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114 ` For example, a customer may switch supplier to take advantage of a potable water source that is not rainfall dependent. In this instance there arises a question as to whether restrictions applied in response to drought should apply to that customer.

115 OFWAT, *Water Act 2003, Water Supply Licensing, Guidance on Access Codes*, June 2005.

- Reconciliation of input and demand at periods agreed between the access seeker and access provider.
- Financial adjustments for over-supply and/or under-supply of water.

Access arrangements for the greater Sydney region could allow for the development of case-specific balancing arrangements, depending on the level of demand for access (low demand may mean no balancing arrangements are needed; high demand for access may result in the development of a water balancing market).

Options for managing water system leakage include:

1. That the access seekers injection obligation is grossed up by a percentage factor to account for their share of leakage (ie, leakage is made up physically), or
2. That the access seeker pays a leakage charge based on a leakage factor determined ex ante (ie, leakage is addressed through a financial transaction).

The second model provides better incentives on the access provider as it benefits from performing better than the estimate and is penalised for doing worse. However, this approach is more information intensive and involves regulation that is more intrusive. Further analysis would be required to establish the materiality of this issue and the costs and benefits of different approaches.

Access to the wastewater network

The main issues arising with access to the wastewater system reflects the fact that wastewater is heterogenous in nature, ie, it may have a significantly different composition at different injection points (eg, a trade waste versus domestic wastewater), and is "blended" during transportation.

Firstly, it may be difficult for an access provider to warrant the composition of wastewater withdrawn at a particular off-take point. The Tribunal understands that Sydney Water does not currently warrant wastewater withdrawn through sewer mining. This is not the case in analogous network industries, where the quality of the commodity transported is generally warranted at an off-take point. However, the Tribunal has no knowledge of whether this might concern potential access seekers or not.

Secondly, if access based competition is initially restricted to large customers, it is likely that such customers would be trade waste or other non-domestic customers. In this instance, depending on the location of individual injection and off-take points, the composition of wastewater withdrawn by an access seeker could cost less to treat once blended with (and effectively diluted by) residential wastewater than that injected by the access seekers customers. Some form of equivalence arrangement would need to be in place so that all wastewater service providers were subject to the costs of treating their customers' wastewater.

A possible model for such an arrangement has been put forward by Marsden Jacobs, Services Sydney's advisors.[116] The model would require an access seeker to quantify its individual and cumulative customer 'volume-composition' functions and either:

1. withdraw a volume of blended wastewater from the network with the same cumulative customer volume-composition characteristics, or
2. withdraw the cumulative volume discharged by its customers in blended wastewater, with some form of compensation mechanism in place based on the difference between:
    a. the cost of treating the volume of blended wastewater withdrawn, and
    b. the cost of treating the access seeker's cumulative customer volume-composition.

According to Marsden Jacobs, the costs used in the compensation mechanism should be the costs of an efficient producer, although other cost benchmarks could be agreed between parties. The Tribunal notes that it is not clear at this stage how complex such an adjustment might be (an issue raised by Sydney Water), and that the costs used in any such compensation arrangement may be subject to regulation by the Tribunal.

116 See Marsden Jacobs, Potential to promote competition in sewerage markets – advice prepared for Services Sydney, 26 July 2004.

APPENDIX D TYPES OF OPEN ACCESS

Arrangements for infrastructure access depend on the industry context and, in particular, the benefits sought from or rationale for access (the overriding objective).

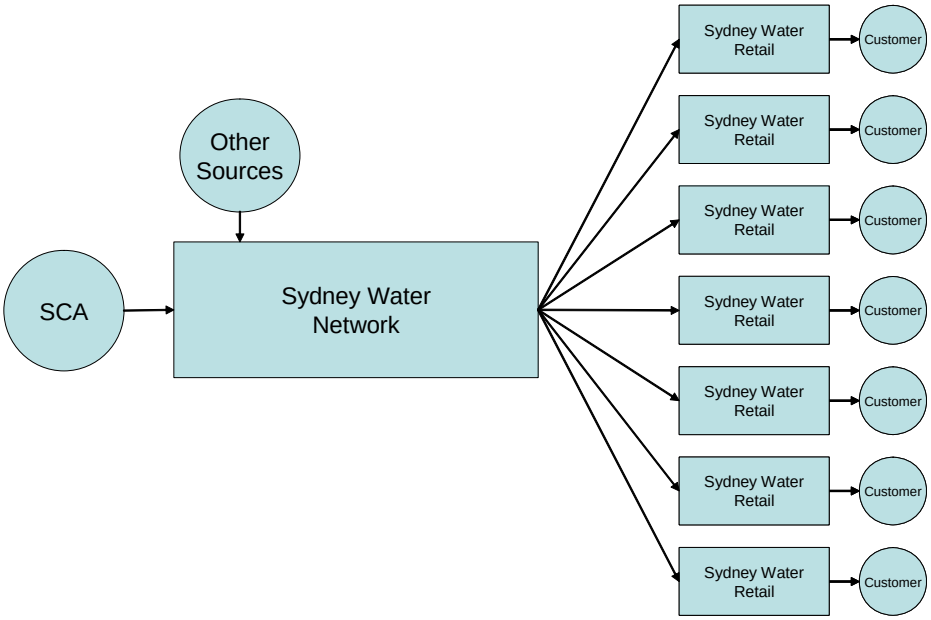
Objectives vary and include the following:

- improve the efficiency of competitive retail elements - improve retail service / put competitive pressure on retail costs
- improve economic efficiency of monopoly parts of the industry (incentive regulation, comparison/yardstick approaches)
- enhance competition for supply and thereby enhance efficiency including supply source innovation.

In the case of water and wastewater services to the greater Sydney metropolitan area, the most pressing objective is to facilitate competition for supply, and encourage efficient and innovative development of new water sources (including better use of all resources in the water cycle). Given this objective, the Tribunal's analysis has concentrated on scenarios where access may be sought or provided to facilitate efficient use and development of water resources, rather than scenarios where access is provided to facilitate retail competition and choice.

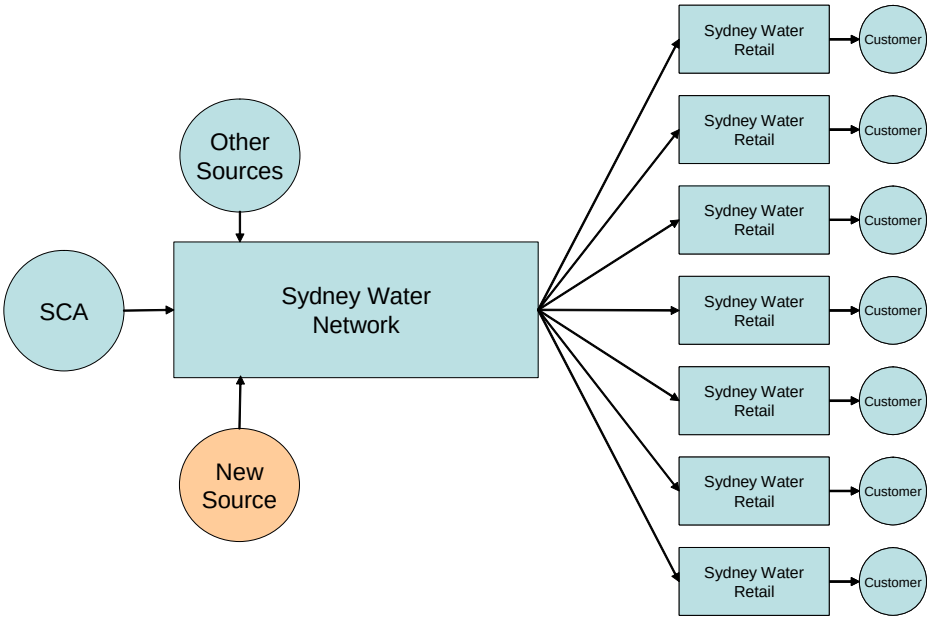
The current integrated supply configuration is presented in Figure C.1 below (for simplicity, initially considering only potable water supply). 'Other Sources' conceptually includes demand management activities. SCA refers to the Sydney Catchment Authority.

Figure C.1 Current Supply Configuration



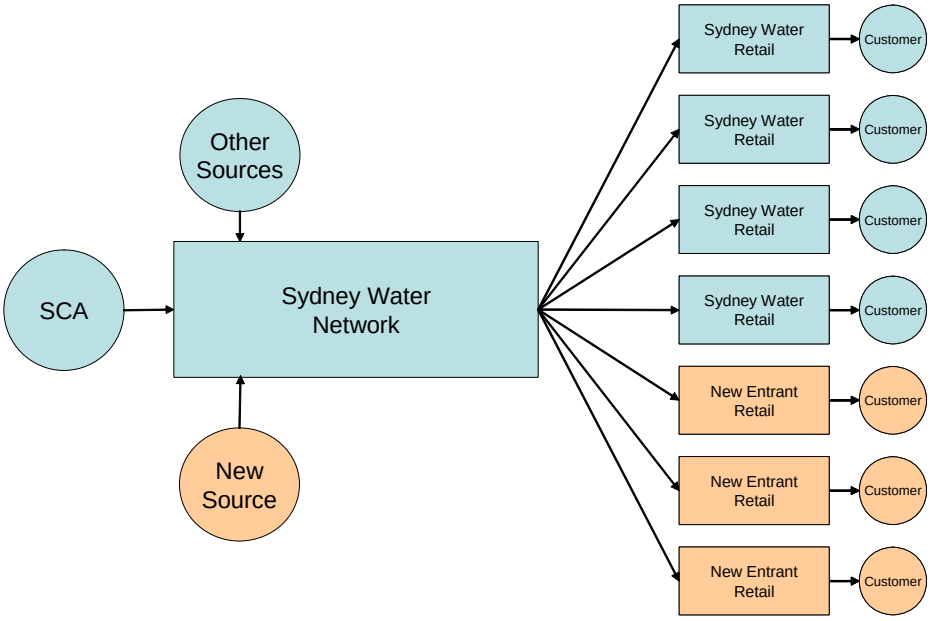
The first type of access configuration occurs when new entrants / third-parties develop new supply sources (Figure C.2 below) and require access at a connection point to realise the value of the resource. If the new water resource is purchased by Sydney Water, this is really just a case of competitive supply. There is no relationship between the new 'bulk' water supplier and consumers. Instead, the bulk water price – at the connection point - is negotiated/agreed with Sydney Water. (Note that the cost of connection is effectively an input cost to the new supplier. As such, this cost would be taken into account in the new entrant's bulk water price.) This is the type of arrangement that will be facilitated through the Tribunal's recommendations regarding competitive sourcing (see Chapter 2).

Figure C.2 Third-Party Supplier of Bulk Water to Sydney Water



A new entrant might inject water into one part of Sydney Water's system and off-take water at another point for the purpose of supplying one or more customers. In this case, the new entrant uses Sydney Water's network to transport[117] water from one point to another (Figure C.3). Under this scenario, an infrastructure access charge is required. This is the access configuration that the Tribunal proposes to facilitate under its recommended 'negotiate-arbitrate' access regime (see Chapter 3).

Figure C.3 Third-Party Access for Transport Services



117 Third-party access to the water system need not be limited to transport. For example, a new entrant could inject raw water into the system and 'toll' it through Sydney Water's water treatment facilities.

The analogous infrastructure access for wastewater is illustrated below. Figure C.4 shows a simplified model of Sydney Water's current wastewater service. Customers 'inject' wastewater into the system, and it is transported through Sydney Water's wastewater network to sewage treatment plants for treatment and disposal. The 'Sydney Water Retail' boxes highlight that Sydney Water operates the customer interface – billing customers for wastewater disposal, etc.

Figure C.4 Simplified Model of Sydney Water's Wastewater System

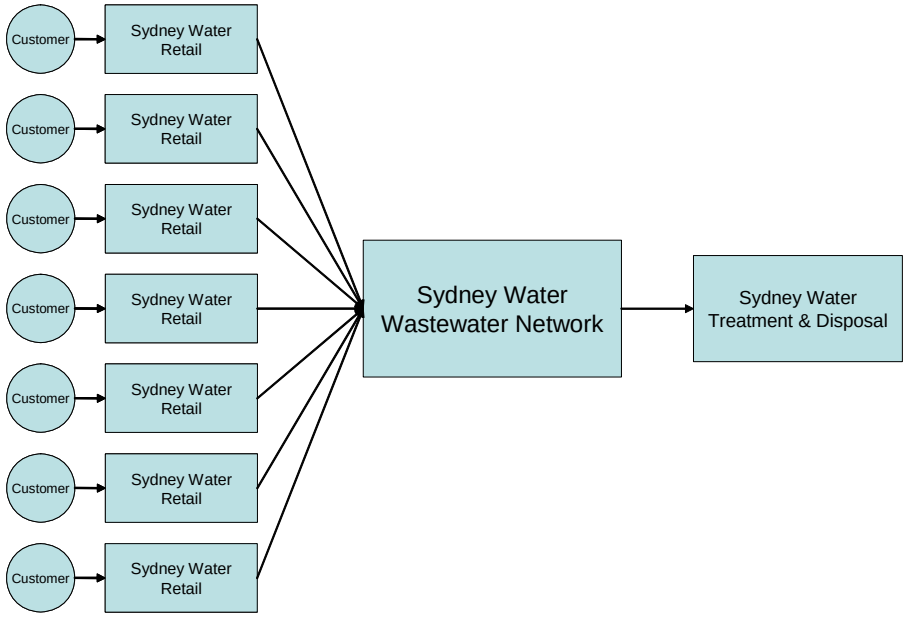
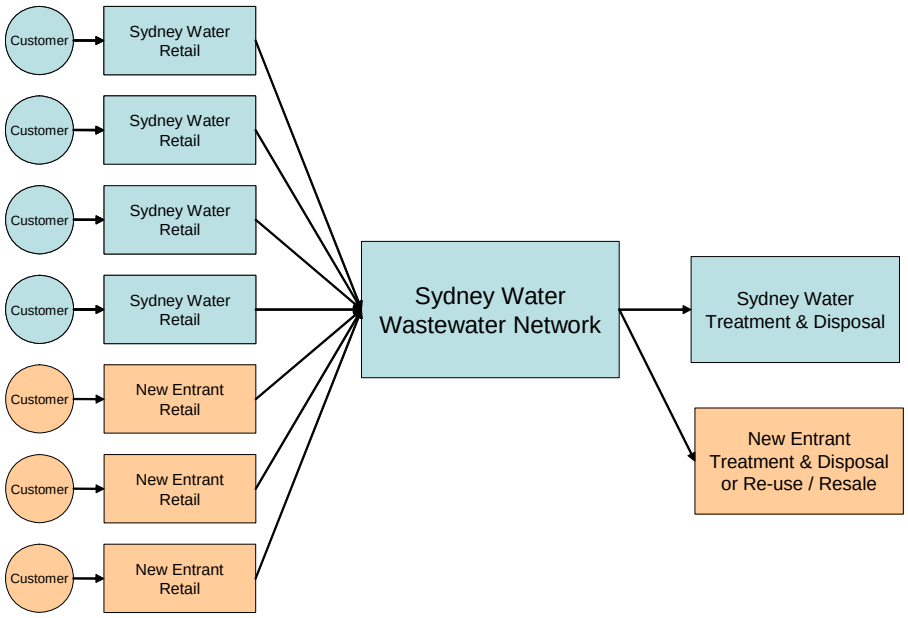


Figure C.5 illustrates a possible access scenario, where a new entrant undertakes treatment and disposal (or 're-use' in the case of recycled water) of wastewater. The new entrant would contract with customers to 'purchase' their wastewater. The new entrant would pay an infrastructure access charge to Sydney Water for using existing sewers to transport the customers' wastewater to the new entrant's wastewater treatment plant.

Figure C.5 Transport through Sydney Water's Wastewater System



Contract carriage versus common carriage

There are essentially two accepted frameworks within which access to infrastructure networks is priced:

- contract carriage, and
- common carriage.

Contract carriage usually involves a retailer (often called a "shipper") contracting with a pipeline owner for point-to-point transport of a commodity (usually gas). Access prices are typically based on the deemed contract path between the injection point and the off-take point. This is the regime used for access to the gas transmission system in the United States and in most states of Australia.

Under common carriage, prices reflect the actual physical flows in the system (not the contract path) and consist of two components – a charge for injection and a charge for off-take. In almost all cases, the injection charge is the incremental cost of accepting the injection at the specific geographic location. Electricity generators and gas suppliers treat the injection charge like any other cost of doing business, and bundle it into their wholesale price (along with fuel, operating costs, etc). The off-take charge (referred to as a "use of system" charge in electricity and gas distribution) recovers the average cost of the network.

Under common carriage an injector's infrastructure access price is independent of the off-takes supplied (type, location, etc). Similarly, the off-take's access (or use of system) price is independent of the injection location. This is the framework used for Australian electricity access regimes, Victorian gas transmission and Australian gas distribution access regimes, and the water network access regime in England and Wales.

An efficiency advantage of common carriage access and pricing relative to contract carriage is that it can be used to reflect the actual costs of injection and off-take at various sites. This is likely to be important with more complex networks. However, contract carriage under some circumstances (eg, point-to-point pipelines) is considered to encourage investment efficiency by requiring users to enter contracts to fund network investment and thereby reduce the role of regulation.

The Tribunal's access price modelling assumes a common carriage framework.

APPENDIX E ACCESS PRICING SCENARIOS

These scenarios use the prices set out in the Tribunal's determination for metropolitan water prices.[118] For water supply, the average retail tariff over the price determination period (1 October 2005 to 30 June 2008) is $1.51/kL for residential customers and $1.25/kL for non-residential customers (fixed charge plus usage charge). The average retail tariff for wastewater services over the period is $1.64/kL. In addition, the scenarios assume an LRMC of water supply in greater Sydney of $1.20/kL. As set out in the Tribunal's determination of metropolitan water prices,[119] this is the lower bound of the current estimated range for the LRMC of water supply of $1.20 to $1.50 per kL, based on the Government's Metropolitan Water Plan. All other figures in the scenarios have been assumed by the Tribunal. In addition, all figures are expressed on a per annum basis and the scenarios calculate an average annualised access charge (per kL) for the determination period.

Please note that the purpose of the scenarios is to illustrate the workings of the different access pricing methodologies and in particular the implications for the cash flows of new entrants – they cannot be taken to be show indicative access prices.

Scenario 1 – Access to wastewater system in an ocean outfall catchment area

Description

A new entrant company:

- collects wastewater at the residential property level across the Sydney metropolitan area and injects into to Sydney Water system, and
- withdraws wastewater at a large coastal sewerage treatment plant (STP).

The volume of wastewater to be transported through the system is assumed to be 10 GL pa, or 3 per cent of the wastewater treated by coastal STPs.

Efficient Component Pricing Rule ($2005/06)

Efficient Component Pricing Rule	Total Revenue or Cost	Cost per Customer	Cost per kL
Sydney Water retail charge	$16,390,000	$381	$1.64
less avoided treatment costs	-$230,000	-$5	-$0.02
less avoided disposal costs	-$100,000	-$2	-$0.01
plus incremental cost of access	$100,000	$2	$0.01
Access Charge	$16,160,000	$376	$1.62

118 IPART, *Sydney Water Corporation, Hunter Water Corporation, Sydney Catchment Authority – Prices of Water Supply, Wastewater and Stormwater Services – Final Report*, September 2005.

119 Op cit, p 18.

Major assumptions:

- Avoided treatment costs of about $25/ML, based on reduced energy and biosolid treatment and disposal costs.
- Avoided disposal costs of about $10/ML, based on reduced screenings and DEC licence costs.
- Incremental cost of regulation assumes total additional cost to Sydney Water of providing access is $1m pa, (order of magnitude estimate only). This would be shared over customers seeking access in some way. This scenario is allocated 10 per cent of the total.

Building block ($2005/06)

Building Block Access Charge	Total Revenue or Cost	Cost per Customer	Cost per kL
Return on Investment	$7,150,000	$166	$0.72
Depreciation	$1,630,000	$38	$0.16
Operating Cost Allocation	$3,190,000	$74	$0.32
Access Charge	$11,970,000	$278	$1.20

Major assumptions:

- Total Sydney Water capital costs and reticulation (operating) cost are allocated to the different catchment areas on the basis of km of pipe used to transport wastewater. Overhead (operating) costs are allocated per property.
- Approximately 3 per cent of Sydney Water's wastewater assets in coastal catchments utilised by new entrant.

The table below illustrates the new entrant's cash flows under the ECPR and building block approaches respectively. The new entrant would bill end-use customers for wastewater services, and pay Sydney Water an access charge. The surplus retained by the new entrant would be used to cover the costs of service delivery (ie, billing and collection, treatment and disposal or re-sale).

Scenario 1 New entrant cash flows - access to wastewater system in an ocean outfall catchment area

	ECPR	Building block	
Wastewater charge	$1.64/kL	$1.64/kL	Customer pays new entrant
less Infrastructure Access Charge	$1.62/kL	$1.20/kL	New entrant pays Sydney Water
Surplus before billing and collection costs, treatment, disposal and/or re-sale	$0.02/kL	$0.44/kL	Retained by new entrant

The table illustrates that, under ECPR, a new entrant would receive only a small surplus (equal to Sydney Water's avoided costs of 2c/kL) after paying for infrastructure access. In other words, a new entrant wanting to treat and re-sell wastewater should not expect to obtain significant revenue from disposal of customers' waste – its business case would rely on selling recycled water for more than its processing cost. Under the building block approach, the new entrant would receive 44c/kL of wastewater taken out of Sydney Water's system.

Long Run Marginal Cost ($2005/06)

LRMC Access Charge	Total Revenue or Cost	Cost per Customer	Cost per kL
LRMC of Capacity	$0	$0	$0.00
Avoidable Operating Cost	$0	$0	$0.00
Incremental cost of access	$100,000	$2	$0.01
Access Charge	$100,000	$2	$0.01

Major assumptions:

- No avoidable operating cost or capacity-related investment included in the LRMC.

Scenario 2 – Access to wastewater system in an inland STP catchment area

Description

A new entrant company:

- collects wastewater at the residential property level across the Sydney metropolitan area and injects into to Sydney Water system, and
- takes wastewater out at an inland STP.

The volume of wastewater to be transported through the system is assumed to be 10 GL pa, or 15 per cent of the wastewater treated by inland STPs

The ECPR infrastructure access price is calculated for two scenarios:

- where the methodology assumes that 80 per cent of the capital expenditure is funded by capital contributions, and
- where the methodology considers the entire cost of avoided investment.

Efficient Component Pricing Rule (with capital contributions $2005/06)

Efficient Component Pricing Rule	Total Revenue or Cost	Cost per Customer	Cost per kL
with capital contributions			
Sydney Water retail charge	$16,390,000	$381	$1.64
less avoided treatment costs	-$1,590,000	-$37	-$0.16
less avoided disposal costs	-$410,000	-$10	-$0.04
less avoided capital costs	-$690,000	-$16	-$0.07
plus incremental cost of access	$100,000	$2	$0.01
Access Charge	$13,800,000	$320	$1.38

Major assumptions:

- Avoided treatment cost estimated to be $160/ML (significantly higher than for coastal treatment plants in Scenario 1).[120]
- Avoided disposal cost estimated to be $41/ML.
- Capital expenditure (net of capital contributions) of $14 million on STP capacity expansion is delayed for five years.[121] This leads to avoided depreciation and return on investment over the current period.
- Incremental cost of access is 10 per cent of the notional $1m total cost to Sydney Water.

Efficient Component Pricing Rule (no capital contributions $2005/06)

Efficient Component Pricing Rule	Total Revenue or Cost	Cost per Customer	Cost per kL
no capital contributions			
Sydney Water retail charge	$16,390,000	$381	$1.64
less avoided treatment costs	-$1,590,000	-$37	-$0.16
less avoided disposal costs	-$410,000	-$10	-$0.04
less avoided capital costs	-$3,430,000	-$80	-$0.34
plus incremental cost of access	$100,000	$2	$0.01
Access Charge	$11,060,000	$256	$1.11

Major assumptions:

- As above except that delayed ('avoided') capital expenditure amounts to $65 million.

120 Avoided treatment and disposal costs are very rough estimates only, as no accurate information was available.

121 It is assumed that 80 per cent of the total expenditure of $65 million will be funded by capital contributions.

Building block ($2005/06)

Building Block Access Charge	Total Revenue or Cost	Cost per Customer	Cost per kL
Return on Investment	$8,090,000	$188	$0.81
Depreciation	$1,850,000	$43	$0.19
Operating Cost Allocation	$3,530,000	$82	$0.35
Access Charge	$13,470,000	$313	$1.35

Major assumptions:

- Approximately 20 per cent of Sydney Water's wastewater assets in inland STP catchment areas are utilised.
- Inland STP catchment areas are assumed to require 15 per cent more metres of pipe per property than coastal catchments due to lower population density.

The ECPR access price is greater than the building block access price when $13 million of capital expenditure is avoided, but less than the building block access price when $65 million of capital expenditure is avoided. The new entrant's cash flows under the ECPR and building block approaches are as follows:

Scenario 2 New entrant cash flows - access to wastewater system in a tertiary treatment plant catchment area

	ECPR ($14m avoided capex)	ECPR ($65m avoided capex)	Building block	
Wastewater charge	$1.64/kL	$1.64/kL	$1.64/kL	Customer pays new entrant
less Infrastructure Access Charge	$1.38/kL	$1.11/kL	$1.35/kL	New entrant pays Sydney Water
Surplus before billing and collection costs, treatment, disposal and/or re-sale	$0.26/kL	$0.53/kL	$0.29/kL	Retained by new entrant

One of the features of an ECPR access price is that it can vary from period to period. For example, the avoided capital costs included in the calculation exist only for the period during which capital expenditure is avoided. If the delayed capital expenditure were undertaken in the next access period, the ECPR access price would rise.

Long Run Marginal Cost ($2005/06)

LRMC Access Charge	Total Revenue or Cost	Cost per Customer	Cost per kL
LRMC of Capacity	$0	$0	$0.00
Avoidable Operating Cost	$0	$0	$0.00
Incremental cost of access	$100,000	$2	$0.01
Access Charge	$100,000	$2	$0.01

Major assumptions:

- No avoidable operating cost or capacity-related investment included in the LRMC.

Scenario 3 – Large desalination plant producing potable water for supply to non-residential customers

Description

A new entrant company:

- inputs potable water (ie, no further treatment required) from desalination plant (or similar) into Sydney Water water system at a single point, and
- withdraws potable water at (say) 3 industrial sites – that is, supplies 3 large customers only.

The volume of water to be transported through the water system is assumed to be 20ML/day or 7.3GL per annum. The access price will primarily relate to the large trunk mains (rather than distribution mains).

Efficient Component Pricing Rule ($2005/06)

Efficient Component Pricing Rule	Total Revenue or Cost	Cost per Customer	Cost per kL
Sydney Water retail charge	$9,120,000	$3,040,000	$1.25
less avoided cost of water purchases	-$8,760,000	-$2,920,000	-$1.20
less avoided treatment costs	-$350,000	-$117,000	-$0.05
less avoided transport costs	-$100,000	-$33,000	-$0.01
less avoided retail costs	-$15,000	-$5,000	$0.00
plus incremental cost of access	$130,000	$43,000	$0.02
Access Charge	$25,000	$8,000	$0.01

Major assumptions:

- Avoided cost of water purchases are based on LRMC of water supply of $1.20/kL.
- Avoided treatment costs are assumed to be $48/ML and transport costs are $14/ML.
- Avoided retail costs are based on $5,000 per customer p.a. account management activity.
- Incremental cost of access is again share of a notional $1m total cost to Sydney Water.

The ECPR outcomes are very sensitive to the assessed LRMC of water supply. The average tariff for non-residential customers is $1.25/kL. Setting the LRMC of water supply to $1.20 (the bottom of the estimated range given by the Government's Metropolitan Water plan) results in a very low access charge (1c/kL) while a LRMC of more than $1.21/kL would result in a negative access charge.

Building block ($2005/06)

Two scenarios for the location of the industrial customers are considered:

- Customers close to the potable supply point.
- Customers distant from the supply point.

Building Block Access Charge (Customers close to desalination plant)	Total Revenue or Cost	Cost per Customer	Cost per kL
Return on Investment	$480,000	$160,000	$0.07
Depreciation	$110,000	$37,000	$0.02
Operating Cost Allocation	$450,000	$150,000	$0.06
Access Charge	$1,040,000	$347,000	$0.15

Major assumptions:

- Cost allocation based on using only large pipes close to desalination plant. A volume-based share of 3 per cent of total supply area network by length has been allocated.

Building Block Access Charge (Customers remote from desalination plant)	Total Revenue or Cost	Cost per Customer	Cost per kL
Return on Investment	$1,450,000	$483,000	$0.20
Depreciation	$320,000	$107,000	$0.04
Operating Cost Allocation	$1,350,000	$450,000	$0.18
Access Charge	$3,120,000	$1,040,000	$0.42

Major assumptions:

- Cost allocation based on using large pipes throughout local network. A volume-based share of 8 per cent of total supply area network by length has been allocated.

If specifically calculated building block based access charges are used, the access charge could vary greatly. However, opportunities for cherry-picking[122] are low because building block based access charges are greater than the ECPR charges, indicating that efficient new entrants are unlikely to be profitable under building block access charges even for 'close' customers, as illustrated in the following table.

122 Introducing differential access prices in the presence of uniform retail prices may create incentives for new entrants to 'cherry-pick' those customers that are cheapest to serve.

Scenario 3 New entrant cash flows – Large desalination plant producing potable water for supply to non-residential customers

	ECPR	Building block (nearby customers)	Building block (distant customers)	
Water supply charge	$1.25/kL	$1.25/kL	$1.25/kL	Customer pays new entrant
less Infrastructure Access Charge	$0.01/kL	$0.15/kL	$0.42/kL	New entrant pays Sydney Water
Surplus before customer service, water and treatment costs	$1.24/kL	$1.10/kL	$0.83/kL	Retained by new entrant

Adopting a building block based access charge will exclude efficient new entrants unless they can somehow deliver water for less than the minimum estimated LRMC of water supply of $1.20/kL. Under Scenario 3, a new entrant would need to deliver water for no more than $1.10/kL for nearby customers, and $0.83/kL for distant customers.

Long Run Marginal Cost

LRMC Access Charge	Total Revenue or Cost	Cost per Customer	Cost per kL
LRMC of Capacity	$0	$0	$0.00
Avoidable Operating Cost	$0	$0	$0.00
Incremental cost of access	$130,000	$43,000	$0.02
Access Charge	$130,000	$43,000	$0.02

Major assumptions:

- No avoidable operating cost or capacity-related investment included in the LRMC.

Scenario 4 – Large desalination plant producing potable water for supply to residential customers

Description

A new entrant company:

- inputs potable water (ie, no further treatment required) from desalination plant (or similar) into Sydney Water's water system single point
- takes out potable water for supply to residential customers.

This is a variation on Scenario 3. It is designed to illustrate the difference between a total "transmission and distribution" water system access price and a transmission "trunk main" only access price. The volume of water to be transported through water system is assumed to be 20ML/day or 7.3GL per annum (as per Scenario 3). The residential customers are assumed to be uniformly spread across metropolitan Sydney.

Efficient Component Pricing Rule ($2005/06)

Efficient Component Pricing Rule	Total Revenue or Cost	Cost per Customer	Cost per kL
Sydney Water retail charge	$11,000,000	$377	$1.51
less avoided cost of water purchases	-$8,760,000	-$300	-$1.20
less avoided treatment costs	-$350,000	-$12	-$0.05
less avoided transport costs	-$100,000	-$3	-$0.01
less avoided retail costs	-$150,000	-$5	-$0.02
plus incremental cost of access	$130,000	$4	$0.02
Access Charge	$1,770,000	$61	$0.25

Major assumptions are as per Scenario 3 except:

- Avoided retail costs based of $5 per customer p.a. meter reading activity.

Building block ($2005/06)

Building Block Access Charge	Total Revenue or Cost	Cost per Customer	Cost per kL
Return on Investment	$1,930,000	$66	$0.26
Depreciation	$430,000	$15	$0.06
Operating Cost Allocation	$1,810,000	$62	$0.25
Access Charge	$4,170,000	$143	$0.57

Major assumptions:

- Approximately 10 per cent (volume weighted share) of the supply area network is allocated.

From a new entrant's point of view, the ECPR and building block methods result in the following cash flows:

Scenario 4 New entrant cash flows – Large desalination plant producing potable water for supply to residential customers

	ECPR	Building block	
Water supply charge	$1.51/kL	$1.51/kL	Customer pays new entrant
less Infrastructure Access Charge	$0.25/kL	$0.57/kL	New entrant pays Sydney Water
Surplus before customer service, water and treatment costs	$1.26/kL	$0.94/kL	Retained by new entrant

Adopting a building block based access charge will exclude efficient new entrants unless they can deliver water for less than $0.94/kL, which is 26c/kL below the minimum estimated LRMC of water supply $1.20/kL.

Long Run Marginal Cost ($2005/06)

LRMC Access Charge	Total Revenue or Cost	Cost per Customer	Cost per kL
LRMC of Capacity	$0	$0	$0.00
Avoidable Operating Cost	$0	$0	$0.00
Incremental cost of access	$130,000	$4	$0.02
Access Charge	$130,000	$4	$0.02

Major assumptions:

- No avoidable operating cost or capacity-related investment included in the LRMC.

Scenario 5 – Small potable water plant for supply to a suburb of residential customers

Description

A new entrant company:

- inputs potable water from stormwater recovery, aquifer storage recharge or equivalent (ie, no further treatment required) into Sydney Water water system single point
- takes out potable water for supply to residential customers in defined suburb (say 4,000 customers).

The volume of water to be transported through water system is assumed to be 1 GL per annum. The injection point/potable water supply is assumed to be in the suburb – that is close to the customers. The access price to be calculated will be a water system access price on a per customer and volume basis. The price will relate primarily to access to the distribution mains only.

Efficient Component Pricing Rule ($2005/06)

Efficient Component Pricing Rule	Total Revenue or Cost	Cost per Customer	Cost per kL
Sydney Water retail charge	$1,510,000	$378	$1.51
less avoided cost of water purchases	-$1,200,000	-$300	-$1.20
less avoided treatment costs	-$50,000	-$13	-$0.05
less avoided transport costs	-$10,000	-$3	-$0.01
less avoided retail costs	-$20,000	-$5	-$0.02
plus incremental cost of access	$20,000	$5	$0.02
Access Charge	$250,000	$62	$0.25

Major assumptions are as per Scenario 4.

The ECPR price is identical to Scenario 4. This highlights the fact that this methodology for calculating network access charge is independent of the characteristics of the network used to supply the customer.

Building block ($2005/06)

Building Block Access Charge	Total Revenue or Cost	Cost per Customer	Cost per kL
Return on Investment	$230,000	$58	$0.23
Depreciation	$50,000	$13	$0.05
Operating Cost Allocation	$210,000	$53	$0.21
Access Charge	$490,000	$124	$0.49

Major assumptions are as per Scenario 4 except:

- Customers in this scenario are allocated slightly less pipe (because they are assumed to use only small local pipes).

From a new entrant's point of view, the ECPR and building block methods result in the following cash flows:

Scenario 5 New entrant cash flows – Small potable water plant for supply to a suburb of residential customers

	ECPR	Building block	
Water supply charge	$1.51/kL	$1.51/kL	Customer pays new entrant
less Infrastructure Access Charge	$0.25/kL	$0.49/kL	New entrant pays Sydney Water
Surplus before customer service, water and treatment costs	$1.26/kL	$1.02/kL	Retained by new entrant

Adopting a building block based access charge will exclude efficient new entrants unless they can somehow deliver water for less than $1.02/kL, which is 18c/kL below the minimum estimated LRMC of water supply of $1.20.

Long Run Marginal Cost ($2005/06)

LRMC Access Charge	Total Revenue or Cost	Cost per Customer	Cost per kL
LRMC of Capacity	$0	$0	$0.00
Avoidable Operating Cost	$0	$0	$0.00
Incremental cost of access	$20,000	$5	$0.02
Access Charge	$20,000	$5	$0.02

Major assumptions:

- No avoidable operating cost or capacity-related investment included in the LRMC.

APPENDIX F SUMMARY OF ACCESS PRICING METHODOLOGIES

The following table compares the access price approaches under possible evaluation criteria.

	ECPR	LRMC of Network Assets plus costs of providing access (no contribution to shared costs)	Building block
Retail Pricing Outcomes	Facilitates retention of any current cross subsidies, current sunk cost, margin and risk allocation, cost recovery equity decisions, etc. If avoided cost calculation is accurate then there are no implications for retail pricing of customers retained by incumbent. ECPR has been criticised because it also allows incumbents to retain monopoly rents. However, this is not a significant problem in Sydney's water industry where the Tribunal also regulates retail tariffs.	To avoid cherry-picking and maintain geographically uniform prices, a single (geographic average) LRMC would be required. See also Financial Outcomes below.	To avoid cherry-picking and maintain geographically uniform prices, a single (geographic average) access charge would be required. See also Financial Outcomes below.
Sydney Water Financial Outcomes	If avoided cost calculation is accurate then no implications for incumbent business.	New entrants (and their customers) make no contribution to sunk costs. Therefore, general situation is that either the incumbent's remaining customers must pay more or the value of the Government's investment in sunk assets is destroyed. However, for Sydney Water LRMC access price is often greater than ECPR access price – so limited value implications.	Network costs are recovered. However retail operating cost per customer will increase with loss of customers. Therefore either the incumbent's remaining customers must pay more or the value of the Government's investment in sunk assets is destroyed. For envisaged regime where access is limited to very large customers, the change in incumbent retail operating cost per customer will be minimal.

	ECPR	LRMC of Network Assets plus costs of providing access (no contribution to shared costs)	Building block
Third Party Entry Outcomes	Theoretically ECPR results in efficient entry. Entry will only occur when third party costs are lower than avoided costs of incumbent. However, initial modeling shows that a 'pure' ECPR basis yields negative access charges/components. If negative charges are not allowed, then some efficient potential new entrants would be excluded.	LRMC is not necessarily lower than the ECPR in Sydney. Therefore at current retail price levels, LRMC may exclude efficient potential new entrants.	Modeling shows that this option is unlikely to give enough headroom between access and retail prices to allow efficient access in water supply. May be a viable option for wastewater.
Locational Pricing Issues	Because retail prices are geographically uniform, ECPR will yield geographically uniform access prices in most circumstances.	For off-takes: To avoid cherry-picking and maintain geographically uniform prices, a single (geographic average) LRMC would be required. Concept of geographically averaged LRMC not necessarily economically meaningful. For injections: LRMC-based access charge would vary geographically. This is considered to be an advantage of the methodology - project proponents see efficient locational pricing signals.	Methodology may be implemented to provide anything from geographically averaged ('postage stamp') to customer specific access prices. One problem with a building block approach and case-by-case calculation of costs in a pipeline system is that access prices will tend to be proportional to the distance between injection and withdrawal. That means that proponents of new sources will have an economically inefficient incentive to find local users for their water. Gas concept of back-haul may be useful but that places severe pressure on geographic uniform prices.

	ECPR	LRMC of Network Assets plus costs of providing access (no contribution to shared costs)	Building block
Administrative Feasibility	Some inputs may involve complex calculations. However, methodology achieves efficient outcome on a case-by-case basis. Costs unlikely to be prohibitive for initial small-scale access. However, initial modeling shows that a 'pure' ECPR basis yields negative access charges/components. If negative components were not allowed, some modification to ECPR (or retail price rises) would be required for implementation.	Not particularly complex but no regulatory consensus on calculation methodology. Parties can dispute methodology adopted and dispute inputs.	Well understood methodology. However allocation assumptions subject to wide discretion and may be disputed in a 'negotiate and arbitrate' framework.
Market Confidence	Supported by Sydney Water.Not supported by Services Sydney. UK water industry precedent. Too early to tell whether the methodology is successful at promoting access. NZ telecommunications precedent including Privy Council finding that it was the method most likely to facilitate entry to a vertical monopoly. However lack of success of ECPR negotiated access framework has led to further regulatory reform.	Australian electricity industry (embedded generation) precedent for LRMC-based access charges for new water sources.	Methodologies well understood from electricity and gas industry access regimes. Large body of regulatory experience and precedent for setting DORC-based access prices.
Stability of Access Prices	LRMC of water source is potentially volatile over time. Replicates dynamic market outcomes – with associated complexity.	LRMC of network is probably quite stable except where specific areas of network congestion drive augmentation.	Very stable. Average cost changes slowly.

APPENDIX G STUDIES REVIEWED ON ECONOMIES AND DISECONOMIES OF SCALE

Study	Results
Tynan & Kingdom (2005), "Optimal Size for Utilities?" *Public Policy for the Private Sector*, Note Number 283, The World Bank Group. Using data from 270 water and sanitation providers in Africa, Indonesia, Peru, the United States and Vietnam, this study uses a 'standard econometric model' to estimate economies of scale.	• While results are mixed, this paper shows that utilities serving a population of 125,000 or less could reduce per customer operating costs by increasing their scale of operation. • In some cases, diseconomies of scale can occur when a large utility (serving more than 125,000) doubles in size. In other case, such an increase in scale does not result in diseconomies.
Stone and Webster (2004), "Investigation into evidence for economies of scale in the water and sewerage industry in England and Wales", for the Office of Water Services (Ofwat). This study employs econometric methodologies to estimate models of industry costs, for both water and sewerage companies (WaSCs) and water only companies (WoCs), over the period 1992/93 to 2002/03.	• There is evidence of diseconomies of scale for the average-sized WaSCs (about 2 million water supply connections and 2.3 million sewerage connections in 2002/03), but these diseconomies are declining over the sample period. Early in the sample period, a 1% increase in scale is associated with a 1.7% increase in long-run costs, while by 2002/03 the same increase in cost is estimated to increase costs by 1.5%. This change reflects improved efficiency in capital investment offsetting rising diseconomies of scale in operating expenditure. • The models show small economies of scale for the averaged sized WoC (about 350,000 water supply connections). However, the presence of constant returns to scale cannot be rejected, and it would therefore be inappropriate to assume that the average sized WoC is characterised by economies of scale. • Stone and Webster (2004, p 5) also note, separate to their modelling, that "Ofwat's water service opex efficiency rankings tend to show deterioration in relative efficiency above around 2.5 million connected properties".
Strategic Management Consultants (2002), *Optimal entity size in the water industry of England and Wales: a review of factors which influence the size of companies*, unpublished report to Ofwat. (Sourced from Stone & Webster, 2004)	According to Stone and Webster (2004, p 24), "The principal conclusion in this report is that technical economies of scale are exhausted at about 400,000 connected properties."
Indepen and Accenture (2002), "Water merger policy: time for review", sponsored by Severn Trent, South East Water, Swan Group and United Utilities water companies, www.indepen.co.uk. Stone and Webster (2004, p 24), argue that "The findings of this study drew largely upon similar work in the electricity sector and did not derive from a robustly estimated model of water service costs."	• Based on a 'bottom up' assessment (ie, looking at the potential for economies of scale in each component of a water utility – including treatment and abstraction, distribution, corporate and customers services and procurement), Indepen estimate the total amount that could be saved from mergers of water companies in England and Wales, as a result of economies of scale, ranges from 5% to 11% of target company costs. It is expected that these cost savings would primarily be achieved via economies of scale in corporate and customer services. • The degree to which these figures vary between actual combinations will depend on a number of factors including the organisation, systems, processes, geographic location

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	and the extent to which the management is capable of achieving the savings. • Actual savings (between 5% and 11%) depends on the size of the companies involved – larger companies will generally achieve larger savings in absolute terms. However, the percentage of the target company's costs that is saved increases with the relative size difference between the two companies. • According to Indepen and Accenture (2002), "A point exists at which diseconomies of scale could affect the performance of water companies. But, given the capabilities of modern technology and management, combined with the scale at which other industries successfully operate, we would argue that the majority of UK water companies are a significant distance from reaching that point. If companies do already find themselves at this point, it may be because they have not adjusted their businesses to the capabilities available in the modern business world. A merger may provide the opportunity and stimulus for them to do so."
Ashton (2003), "Capital Utilisation and Scale in the English and Welsh Water Industry", *The Services Industry Journal*, 23(5), pp 137-149. This study estimates a variable cost model of the UK water industry. From this variable cost function, estimates of economies of scale and economies of capital utilisation and capacity utilisation are made (for the period 1991-1996). The data used in the study consist of 20 English and Welsh water companies (average population serviced of 660,000 and average length of water mains 3,726km).	The results indicate that "slight, albeit significant diseconomies of scale and substantial diseconomies of capital utilisation exist in the industry."
Saal and Parker (2001), "Productivity and Price Performance in the Privatised Water and Sewerage Companies of England and Wales", *Journal of Regulatory Economics*, 20, 61-90. Total costs for the 1985-99 period are estimated using a cost function model with quality adjusted sewerage and water service outputs, and labour, capital and other materials as inputs.	The study finds substantial diseconomies of scale for the mean water and sewerage company (WaSC) in England and Wales, with a scale elasticity estimate for the mean WaSC ranging from 0.83-0.88 in several alternative specifications (<1 measuring diseconomies).
Mizutani & Urakami (2001), "Identifying network density and scale economies for Japanese water supply organizations", *Papers in Regional Science* 80, pp 211-230. This study estimates cost functions, for the water industry in Japan, with three different cost models (log-linear, translog and translog with a hedonic function).	• there are economies of network density at the sample mean, however the magnitude of these economies is not large; • there are diseconomies of scale at the sample mean; • the optimal size (which is the size that attains minimum average cost) of a water supply agency is a size of 261,084 thousands m^3 and a network length of 1,221 km; and • for this output and network size, the optimal size of a water-supplied population is about 766,000.

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World Bank (1997), "Toolkits for private participation in water and sanitation", http://www.worldbank.org/html/fpd/water/wstoolkits/Kit1/frame.html	This source merely states that "U.K. experience suggests that a service area of less than about 500,000 customers leads to suboptimal operation."