

Draft Report

Inquiry into Pricing of Recycled Water in Western Australia

4 November 2008

Economic Regulation Authority



WESTERN AUSTRALIA

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Executive Summary

Recycled water has an important role to play in delivering cost-effective fit for purpose water to customers who would otherwise use scheme water. The Authority is pleased to present its draft recommendations of its Inquiry into Pricing of Recycled Water in Western Australia.

This inquiry was requested by the State Government of Western Australia on 8 July 2008. The terms of reference require the Authority to “undertake an inquiry into, and make recommendations on, pricing and other relevant factors affecting the adoption of recycled water and other alternative water supplies”.

The main draft recommendation is that providers of water recycling services that are selling recycled water from assets that were constructed for the purpose of treating wastewater for regulated customers should follow a set of guiding principles when they engage in pricing negotiations with potential customers. The guiding principles would allow for three components to be included in the recycled water price:

- A charge associated with the costs of delivering the recycled water to the customer, including any incremental costs that might be incurred in treating the wastewater to be fit for purpose.
- A negative adjustment in price to take into account any costs that are avoided as a result of selling the recycled water. For example, the operating costs of discharging the wastewater to the environment would be avoided.
- If the amount of wastewater available to be recycled is less than the demand for the recycled water, then an additional premium would be added to the price to reflect its relative scarcity. The premium should be determined by a neutral tendering process.

The guiding principles would complement, and may be superseded by, pricing principles that would be established under a third party access regime. A third party access regime would allow other parties to transport wastewater through the natural monopoly infrastructure (in exchange for an appropriate access fee to the infrastructure owner), which would facilitate the provision of recycled water services.

The Water Corporation submission implies that the Water Corporation generally seeks to recover a contribution from recycled water customers towards the joint costs of the wider wastewater network. The Authority does not consider that this is appropriate where there is no scarcity in the wastewater resource, for the reason that the joint costs associated with providing the wastewater network are not costs that have been caused by the recycled water customer, and are therefore not appropriately recovered from those customers. Rather, recycled water customers would generally reduce costs to users of the network.

Where any scarcity revenue is received by the service provider, it should be used to offset either customer tariffs or Community Service Obligation payments. In this way, the benefits from selling a ‘valuable’ wastewater resource would go to the providers of the wastewater (households and businesses). In these circumstances, recycled water customers could contribute towards joint costs.

The Authority is not recommending that the price of recycled water from large recycling plants be regulated. Unlike wastewater treatment plants, large recycling plants were not constructed for the purpose of providing a monopoly service to regulated customers. The

pricing of recycled water from large recycling plants is a commercial issue between the service provider and its customers. However, it is important that a State-based access regime be introduced to provide competitive pressures on the pricing policies of incumbent recycling plant owners.

In the case of third pipe schemes, where services are provided by a monopoly provider and customers do not have an alternative supply option, some form of light-handed regulatory oversight may be required to ensure that the rate of return is not unreasonably high.

The Authority was also requested to consider the pricing recommendations of the State Water Recycling Strategy, including the appropriateness of faster adoption of cost-reflective prices for major industry. By “faster adoption of cost-reflective prices for major industry”, the Terms of Reference refer to the current policy of transitioning metropolitan commercial water usage charges to charges based on long run marginal cost by 2014. The delay in transition towards cost-reflective water usage charges is primarily to address social issues, such as the impact of large price increases on tenants and low income households. However, there are no such social considerations in the case of commercial or industrial customers. The Authority’s view is that all metropolitan commercial customers should be treated equally and transitioned to cost-reflective water usage charges by 2010.

The Authority wishes to thank those who provided the nine submissions that were received in response to the Issues Paper. Those submissions have helped formulate these draft recommendations.

The Authority now welcomes a further round of submissions on the draft recommendations. Submissions are due by 12 December 2008. Following receipt of those submissions, the Authority will prepare its final report for delivery to the Treasurer by 6 February 2009. The Government is then required to table the report in Parliament within 28 days of its receipt.

Summary of Draft Recommendations and Findings

- 1) Recycled water from wastewater treatment plants should be priced to reflect the prices that would emerge under a competitive market. These prices would have three components:
 - A charge associated with the costs of delivering the recycled water to the customer, including any incremental costs that might be incurred in treating the wastewater to be fit for purpose.
 - A negative adjustment in price to take into account any costs that are avoided as a result of selling the recycled water. For example, the operating costs of discharging the wastewater to the environment would be avoided.
 - If the amount of wastewater available to be recycled is less than the demand for the recycled water, then an additional premium would be added to the price to reflect its relative scarcity. The premium should be determined by a neutral auctioning process.

These guiding principles would complement, and may be superseded by, pricing principles that would be established under a third party access regime.

- 2) The price of water from recycling plants that are not providing a service to regulated customers is a commercial matter between the service provider and its recycled water customers.
- 3) The Kwinana Water Reclamation Plant should be treated as a commercial venture between the Water Corporation and industrial customers, without any regulatory oversight of prices.
- 4) In the case of third pipe schemes, where services are provided by a monopoly provider and customers do not have an alternative supply option, some form of light-handed regulatory oversight may be required to check that the rate of return is not unreasonably high.
- 5) Analysis of the Water Corporation's non-potable supply charges to residents of Brighton Estate indicates that the rate of return appears very high relative to the risks of the project.
- 6) All metropolitan commercial customers should be treated equally and transitioned faster to cost-reflective usage charges (by 2010 rather than 2014). (The Authority is considering the issues of usage charges for commercial customers in its inquiry into the tariffs of the Water Corporation, Aqwest and Busselton Water.)
- 7) In the absence of a competitive market in the provision of recycled water projects, recycling targets can provide an incentive for service providers to seek out and invest in cost effective recycling options.
- 8) The cost effectiveness of rebates will depend on the cost per kilolitre saved, where the cost is the cost of the rebate plus the additional installation costs to the customer. The Authority will be investigating this further.
- 9) As with rebates, the cost effectiveness of mandatory standards will depend on the cost per kilolitre of water saved. The Authority will be investigating this further.
- 10) The reservation of water supplies for specific purposes involves second-guessing the value of water to users. Whenever wastewater is a scarce resource, it should be allocated using a neutral auctioning process.
- 11) A State-based third party access regime should be introduced. This would allow third parties access to the wastewater network for the purpose of providing recycled water.

1 Introduction

On 8 July 2008, the Treasurer of Western Australia gave written notice to the Economic Regulation Authority (the **Authority**) to “undertake an inquiry into, and make recommendations on pricing and other relevant factors affecting the adoption of recycled water and other alternative water supplies”.

1.1 Terms of Reference

The inquiry has been referred to the Authority under Section 32(1) of the *Economic Regulation Authority Act 2003 (Act)*, which provides for the Treasurer to refer to the Authority inquiries on matters related to regulated industries (i.e. water, gas, electricity and rail industries).

A full text of the Terms of Reference is provided in Appendix 1.

In accordance with the Terms of Reference, the Authority is to consider and develop findings on:

- 1) the circumstances in which recycled water prices should be regulated, and the recommended approach to any required regulation;
- 2) the pricing recommendations of the State Water Recycling Strategy, including the appropriateness of faster adoption of cost-reflective prices for major industry; and
- 3) other factors that the Authority considers relevant to the adoption of recycled water and other alternative water supplies.

In developing its recommendations the Authority must have regard to:

- the Government’s social, economic and environmental policy objectives;
- distributional issues, such as those between customers of recycled water services and other services in the same scheme; and
- any relevant pricing principles arising from the 1994 Council of Australian Governments water reform agreement and the National Water Initiative.

In undertaking the inquiry, the Authority recognises section 26 of the Act which requires the Authority to have regard to:

- the need to promote regulatory outcomes that are in the public interest;
- the long-term interests of consumers in relation to price, quality and reliability of goods and services provided in the relevant markets;
- the need to encourage investments in relevant markets;
- the legitimate business interests of investors and service providers in relevant markets;
- the need to promote competitive and fair market conduct;
- the need to prevent abuse of monopoly or market power; and
- the need to promote transparent decision making processes that involve public consultation.

1.2 Review Process

The process for this review is as follows.

- The terms of reference for the inquiry were received by the Authority from the then Treasurer on 8 July 2008.
- The Authority published an Issues Paper on 1 August 2008, providing background information on the issues to be investigated, and inviting public comment. Nine submissions were received in response to the Issues Paper. One submission and parts of another submission were accepted by the Authority as being confidential on the grounds of commercial sensitivity. Submissions or parts of submissions that are not confidential are published on the Authority web site, www.era.wa.gov.au.
- Submissions on this Draft Report are due by 12 December 2008.
- In accordance with the Terms of Reference, the Authority must present its Final Report to Government no later than seven months after receiving the Terms of Reference (by 6 February 2009).

The Authority will also be consulting with its Consumer Consultative Committee during the course of its inquiry.

In accordance with section 45 of the Act, the Authority is acting through the Chairman and Members in conducting this inquiry.

1.3 How to Make a Submission

Submissions on any matter raised in this Draft Report or in response to any matters in the Terms of Reference should be in written form and electronic form (where possible) and addressed to:

Inquiry into Pricing of Recycled Water in Western Australia
Economic Regulation Authority
PO Box 8469
Perth Business Centre
PERTH WA 6849

Email: recycledwater@era.wa.gov.au

Fax: (08) 9213 1999

Submissions must be received by 12 December 2008.

Submissions made to the Authority will be treated as in the public domain and placed on the Authority's web site unless confidentiality is claimed. The submission or parts of the submission in relation to which confidentiality is claimed should be clearly marked. Any claim of confidentiality will be dealt with in the same way as is provided for in section 55 of the Act.

The receipt and publication of a submission shall not be taken as indicating that the Authority has knowledge either actual or constructive of the contents of a particular submission and, in particular, where the submission in whole or part contains information of a confidential nature and no duty of confidence will arise for the Authority in these circumstances.

Further information regarding this inquiry can be obtained from:

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2 Water Recycling

Water recycling can take many forms, depending on the nature and source of the inputs, treatment processes, the scale of the scheme, the quality and end use of the final product, and the relationships between the providers of the recycled water and the end users. This section first defines what is meant by water recycling, and sets out a framework for categorising different approaches to water recycling. The experience with water recycling, in Western Australia and other States, and the potential for other schemes in the future, is discussed within this framework.

2.1 Definitions

The State Water Recycling Strategy defines recycled water as:

the multiple use of water, usually sourced from wastewater (also known as sewerage) or stormwater systems, after it has been treated to a standard appropriate for its intended use.¹

The National Water Commission refers to water recycling as:

water from a wastewater treatment plant or from collected stormwater that has been treated to an appropriate quality and is then used for some beneficial purpose.²

Recycled water can be produced on a commercial basis by a service provider or on-site by a household or business.

Examples of commercially-generated recycled water include:

- large scale wastewater recycling plants, such as the plant at Kwinana;
- collection of household wastewater and treatment by the service provider for non-potable re-use (e.g. irrigation of parks);
- provision of non-potable water by the service provider to industry or households for non-potable use via a third pipe system.

On-site recycled water generally refers to greywater recycling. Greywater is household water that has not come into contact with toilet waste. Generally, this includes water from the laundry and bathroom (greywater from the kitchen is generally not used due to the high levels of organic materials such as oils and fats).

There are two broad categories of greywater:

- greywater diversion whereby the water is diverted for use without any further treatment; and
- greywater treatment where the water is treated to a quality that allows other uses for the water such as flushing toilets or sprinkler irrigation.

Greywater recycling does however pose potential health risks and must either be treated accordingly or used for sub-surface irrigation if untreated.

¹ State Water Recycling Strategy, June 2008.

² National Water Commission, *Using Recycled Water for Drinking, An Introduction*, Waterlines Occasional Paper No 2, June 2007.

In addition, there are “other alternative water supplies” (referring to the term used in the Terms of Reference) which, under the definition above, cannot be considered recycling, because they do not involve multiple use. These substitutes for scheme water include:

- rainwater tanks;
- bores that tap into the superficial aquifer, such as garden bores and bores used by horticulturalists, local governments and industry; and
- stormwater (e.g. for recharging of aquifers, or irrigation of public open spaces).

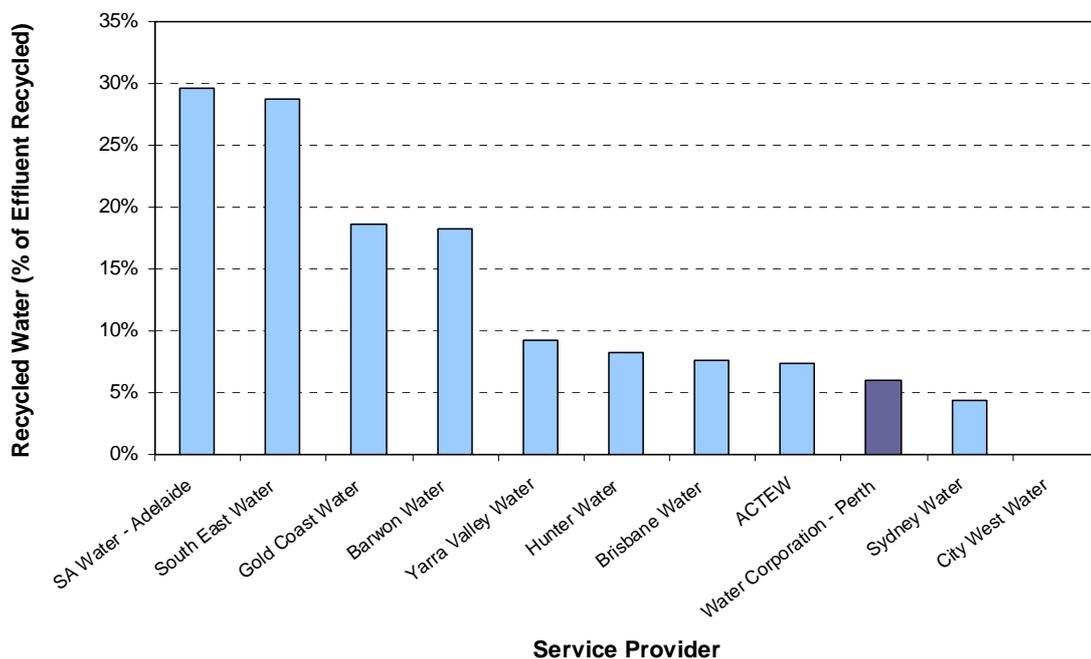
2.2 What is the Current Extent of Recycling and Other Alternative Supply?

This section provides an indication of the current extent of recycling and discusses the range of recycling activities that are currently underway in Western Australia.

The State Water Recycling Strategy identifies that currently 17 gigalitres (GL) or 12.5 per cent of wastewater is recycled in the State, an increase from 11.6 per cent in 2006.³

Figure 2.1 shows the Water Corporation’s rate of recycling in the Perth metropolitan area compared to that of other large metropolitan service providers.

Figure 2.1 Comparison of Percentage of Effluent Recycled for Largest Service Providers (More than 100,000 Customers)⁴



Source: National Water Commission and Water Services Association (2008), National Performance Report 2006-07 – Urban Water Utilities, pg 14.

³ State Water Recycling Strategy (June 2008). A gigalitre (GL) is one billion litres of water.

⁴ These figures include only the volume recycled within the service provider’s area of operation. Inland service providers often treat water before returning it to the environment for use downstream.

Table 2.1 shows the extent of wastewater reuse by wastewater service providers in Western Australia.

Table 2.1 Wastewater Reuse by Wastewater Service Providers in WA⁵

Service Provider	Volume of wastewater receiving treatment (ML) ⁶	Volume of wastewater reused (ML)	Per cent of wastewater reused
Shire of East Pilbara	222	222	100
Shire of Dalwallinu	189	189	100
Shire of Morawa	65	65	100
Shire of Dowerin	11	11	100
Shire of Wickepin	6	6	100
WC – Albany ⁷	1,873	1,873	100
WC – Australind/Eaton	920	920	100
WC – Broome	1,051	1,051	100
WC – Manjimup	286	286	100
WC – South Hedland	466	466	100
WC – Merredin	105	103	98
WC – Karratha	1,059	985	93
WC – Dunsborough	404	303	75
Shire of Dumbleyung	33	22	67
Shire of Moora	72	45	63
City of Kalgoorlie/Boulder	2,693	1,158	43
WC – Narrogin	336	131	39
WC – Northam	371	130	35
WC – Katanning	337	91	27
WC – Esperance	588	153	26
WC – Geraldton	1171	281	24
Shire of Lake Grace	13	3	23
WC – Busselton	1232	234	19
Pilbara Iron	524	38	7
WC – Perth	115,967	6,958	6

Source: Economic Regulation Authority, *Water Licensing - Licence Statistics, 2006-07*.

It should be noted that mining companies also recycle considerable volumes of water (for example, water from mine dewatering can be used on mine sites and in mining operations). The mining sector in WA uses around 600 GL of water per year, 95 per cent of which is from groundwater sources.⁸ Estimates from the mining industry are that up to 30 per cent of these water resources are recycled at least once, although this varies

⁵ The other wastewater service providers that either do not or have not reported wastewater reuse include the shires of Yilgarn-Southern Cross, Yilgarn-Marvel Loch, Victoria Plains, Ravensthorpe, Jerramungup, Koorda, Kent, Goomalling, Gnowangerup, Coolgardie and Brookton; Water Corporation's schemes in Bunbury, Collie, Jurien, Kununurra, Mandurah and Newman; and Rottnest Island Authority.

⁶ A megalitre (ML) is one million litres of water.

⁷ WC refers to the Water Corporation.

⁸ Source: State Water Plan 2007, pp38-40..

substantially between mine sites, from no recycling to almost full recycling on some mine sites. Water recycling by mines is an example of on-site recycling by private companies and is not regulated, so will not be considered in this inquiry.

2.2.1 Current Recycling Schemes

This section provides examples of current recycling schemes in Western Australia.

Industrial applications

- The Kwinana Water Reclamation Plant (**KWRP**), which is owned by the Water Corporation, is the largest single recycler of wastewater in Western Australia, recycling approximately 6 GL annually. The KWRP adopts a process using microfiltration and reverse osmosis. The KWRP is located in the Kwinana industrial area and supplies recycled water to a number of companies for industrial purposes.⁹
- The Water Corporation is currently negotiating with industries in Kwinana to provide wastewater from the Water Corporation's Sepia Depression Ocean Outfall Line. The wastewater, which currently goes out to sea, would require no additional treatment and would be used for industrial purposes.
- All of the wastewater from the Water Corporation's wastewater treatment plant in Kambalda, in the eastern Goldfields, is supplied directly to a major customer for industrial use.
- All of the wastewater from the Pinjarra Wastewater Treatment Plant is treated through a process of pond treatment and re-used in Alcoa's Pinjarra Refinery.

Public open spaces

- Recycled water has been used in Western Australia for the last 50 years to irrigate public open spaces. This occurs primarily in regional WA, where about 40 per cent of treated wastewater is recycled.¹⁰ Recycling is often the least cost method of disposal. An estimated 70 GL of water, or three per cent of all water in WA, was used for public open spaces in 2005.¹¹ This includes the irrigation of golf courses, sporting ovals and parks.
- In the Perth metropolitan area there has been some limited examples of recycled water use on public open spaces. However, most have been demonstration projects. McGillivray Oval located at the University of Western Australia (**UWA**) was established as a demonstration project in 2004, using treated wastewater from the Subiaco Wastewater Treatment Plant. The project includes filtration and chlorination of secondary treated wastewater from the plant. This treated water is piped 800 metres in a new (300 mm diameter) pipeline under Brockway Road to the UWA Sports Park where it connects to the existing reticulation system in the Park.¹²

⁹ For more information, see www.watercorporation.com.au/files/PublicationsRegister/7/kwrp-brochure.pdf

¹⁰ Source: State Water Recycling Strategy, June 2008.

¹¹ Source: Water Corporation, <http://www.thinking50.com.au/index.cfm?objectid=6363FA43-1708-51EB-A67C6EE570623C18>

¹² Water Corporation (2006), Integrated Water Supply Scheme, Security through Diversity, 2005 – 2050, Water Recycling.

Agroforestry

- The largest recycled water project for forestry use in Western Australia is the Albany Tree Farm. Treated wastewater from the Albany Wastewater Treatment Plant has been used to water over 300 hectares of gum trees in Albany for more than ten years. Some trees were harvested in 2003 with more harvested in 2006. Plans are underway to increase the size of the tree farm. The harvested trees are used for wood chips and making paper.¹³

Residential third pipe schemes

- United Utilities Australia has been nominated by LandCorp as the preferred water service provider to Gracetown. Used water (sewage) from homes will be treated to Class A+ standard and reclaimed water will be delivered back to homes for non-drinking uses (toilet flushing, washing machines, and subsurface garden irrigation) and also used in the town as a fire fighting supply. Drinking water will continue to be self-supply, utilising individual rainwater tanks. The proposed scheme aims to be operational by 2010 and will make use of a new renewable energy source (wind or solar) which will off-set the grid supply.¹⁴
- Moama Lifestyle Villages is currently seeking a licence from the Authority to construct a wastewater recycling scheme for a residential development in North Baldy, comprising 415 park homes and other recreational facilities, which will recycle treated effluent via a specially designed irrigation system.¹⁵

Groundwater management

- The wastewater treatment plants in Mandurah (Halls Head, Gordon Road and Caddadup) are examples of using recycled water to manage groundwater. Treated wastewater from the plants is used to recharge the superficial aquifer through the use of infiltration basins on site. The wastewater is treated to a secondary level to reduce nitrates before passive sand filtration. The water is filtered through fractured limestone to the superficial aquifer which further reduces pathogens, nitrogen and phosphorous. The water is later extracted for use on parks and other open spaces. The City of Mandurah noted in its submission to the inquiry that the City is exploring additional use of the groundwater near the wastewater treatment plants for the irrigation of parks, ovals, golf courses and schools.

Reuse from coastal drainage

- In parts of the South West and South Coast regions of Western Australia, constructed drains convey water from farms, thus permitting agriculture by minimising inundation and waterlogging. For example, a turf farm on Dirk Brook benefits from storing first flush water¹⁶ in a separate basin and then uses it for irrigation.
- Nutrient-rich winter run-off from agricultural land in the Peel-Harvey catchment area is captured, piped and pumped by Alcoa for use in its Pinjarra refinery.

¹³ Ibid, p5.

¹⁴ For further information, see <http://internet.landcorp.com.au/portal/page/portal/grace/sustain/water>

¹⁵ For further information, see the Authority's web site.

¹⁶ First flush water refers to the initial run-off from an area, which often contains higher levels of pollutants compared with later run-off following further rainfall. First flush storage systems are aimed at capturing and isolating the most polluted run-off.

Greywater reuse

- The Australian Bureau of Statistics estimated in 2006 that 26 per cent of Perth households re-used greywater on the garden. However, according to the Department of Water, only 123 households have obtained rebates for greywater systems. It is likely that most households that are using greywater are transferring it onto their gardens without using the type of greywater diversion systems that attract a rebate. The cost of the plumbing adjustments to separate greywater from toilet and kitchen waste may be limiting the uptake of greywater reuse systems.
- The Bridgewater residential village development in Mandurah will make use of on-site greywater recycling for private garden irrigation.

2.2.2 Current Use of Alternative Supplies

In addition to recycling schemes, there are a number of examples of customers making use of alternative supplies. These examples are discussed in this section.

Groundwater use by industry

- The Water Corporation indicated in its submission that there is considerable use of groundwater for self supply by industrial, mining and agricultural users; e.g. industrial customers in Kwinana, mining customers treating saline water in the eastern Goldfields to supplement potable scheme water from the Integrated Scheme, horticultural customers on the Gnangara mound. (Water Corporation submission, p7)

Garden bores

- Around 25 per cent of Perth households have a domestic bore (155,000 bores out of approximately 600,000 connections).¹⁷
- According to the Department of Water, 20,000 rebates have been provided for domestic bores.

Rainwater tanks

- Around 5 per cent of Perth households have a rainwater tank (29,500 tanks out of approximately 600,000 connections).¹⁸
- According to the Department of Water, 14,000 rebates have been provided for rainwater tanks.

Third pipe schemes using groundwater

- The Brighton residential estate, developed by the Satterley Property Group in the northern suburb of Butler, provides a reticulated, non-potable water supply through a third pipe system. Community bores are used to supply water from a shallow groundwater aquifer for use on public open spaces and also private gardens. The Water Corporation provides both the non-potable water service and the potable water supply (through a different set of pipes). The Brighton estate scheme can be viewed as an alternative source scheme rather than a recycling scheme.

¹⁷ Source: Department of Water

¹⁸ Source: Department of Water

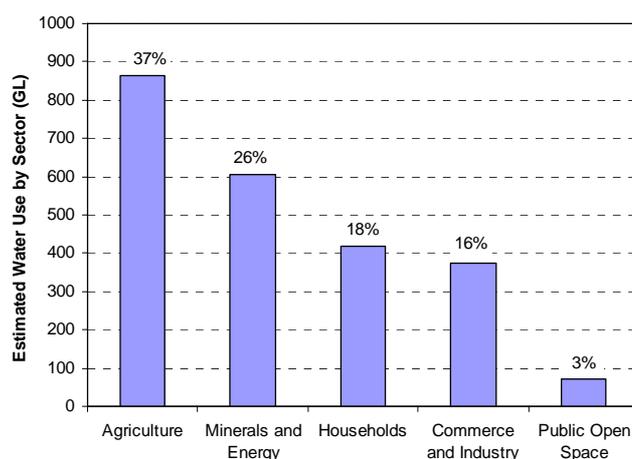
- The Wungong Urban Water Project, by the Armadale Redevelopment Authority, will develop a third pipe system to deliver non-potable water, harvested from roof drainage, stormwater drainage and groundwater, to an urban development of up to 40,000 homes.

2.3 What is the Scope for Additional Recycling and Other Alternative Supply?

The large volume of wastewater discharged every year provides an indication of the potential for additional recycling, if it is cost effective.

- Each year, the Water Corporation's wastewater treatment plants in Western Australia produce 150 gigalitres of treated wastewater, of which 12 per cent is recycled. The Water Corporation notes in its submission that the volume of wastewater flows is expected to double in the next 50 years.
 - In the metropolitan area, 115 GL of wastewater is produced each year, largely concentrated at the Woodman Point (50 GL), Beenyup (43 GL) and Subiaco (22 GL) wastewater treatment plants.¹⁹ These plants generally treat the wastewater to a level suitable for discharge into the ocean. About 6 per cent of the wastewater is recycled.
- In Western Australia, the average person produces 200 litres of wastewater every day. Wastewater is 99.97 per cent water because by far the greatest volume comes from showers, baths and washing machines. The rest is dissolved and suspended matter.²⁰
- In 2005, an estimated 864 GL of water, or 37 per cent of all water usage in Western Australia, was used by the agricultural sector (see Figure 2.2 below).²¹ Almost all of this water was used in the high value irrigation sector, which includes irrigated pasture, turf farms and horticulture. However, currently in Western Australia, there is very little use of recycled water for agricultural purposes.

Figure 2.2 Estimated Water Use (GL) and Percentage of Total Water Used by Sector in 2005



Source: State Water Plan 2007

¹⁹ Source: State Water Recycling Strategy, June 2008.

²⁰ http://www.watercorporation.com.au/W/water_recycling_faq.cfm

²¹ Source: State Water Plan 2007.

Studies currently being undertaken for the Department of Water estimate that the median annual discharge of stormwater from the Perth and Peel Metropolitan regions is 120 GL. It may be feasible to use some of this water without adverse impacts on waterways. However, the Water Corporation has estimated that less than 10 per cent of Perth's stormwater is transported by constructed drains to rivers, local waterways, wetlands and the ocean, which is significantly less than in other Australian cities.²²

- A project by the Town of Cottesloe will filter stormwater that will then be used to replenish the Cottesloe groundwater aquifer. It will involve removing 10 stormwater ocean outfalls and installing underground stormwater treatment, storage and recharge tanks. Stormwater will also replenish the aquifer through 280 roadside soak pits.²³

2.3.1 Potential Recycling Schemes

The following discussion identifies the recycling projects that are either currently under consideration in Western Australia or are operating elsewhere.

Groundwater management

- One of the options being given further consideration by the Water Corporation is increased use of groundwater replenishment using recycled water. Groundwater replenishment is often also referred to as Managed Aquifer Recharge (**MAR**). MAR is a process where water from wastewater treatment plants is treated and then returned to local aquifers. Costs of MAR vary depending on the level of treatment (e.g. sedimentation, chemical, filtration or in some cases reverse osmosis) and the method of returning the water to the aquifer (e.g. passive filtration into shallow aquifers, or pumping into deeper aquifers).
- Because groundwater is very slow moving, the treated water would remain in the ground for decades (up to 50 years) before it reaches existing bores that are used for public water supply. During that time, the water would mix with existing groundwater as it travels through the underground aquifer, until the two are indistinguishable.
- Recycled water for groundwater replenishment is a source that does not rely on rainfall, and has the potential to increase as Perth's population increases.
- Recycled water for groundwater replenishment has the potential to contribute an additional 25-35 GL per year to drinking water supplies by 2015, which could supply up to 100,000 households. This volume and timeframe assumes that water can be extracted now in anticipation of sufficient recharge over coming decades.
- The Gngangara Groundwater Replenishment Trial, due to be completed in 2012, is currently under development with both the State and Federal Governments contributing \$15 million each to the cost of the trial.²⁴

Agriculture

- In South Australia, large scale recycling schemes supply recycled water to agricultural areas. The Virginia Plains Scheme²⁵ involves a network of pipelines of

²² For more information on stormwater recycling, see the following information on the Corporation's web site <http://www.thinking50.com.au/index.cfm?objectid=087686A9-1708-51EB-A68F4DC10450094A>

²³ For more information see, <http://www.nwc.gov.au/agwf/wsa/project.cfm?projectID=47&ref=2>

²⁴ For further information see, <http://www.thinking50.com.au/index.cfm?objectid=63630285-1708-51EB-A6841B0D43457275>

more than 100 kilometres supplying 15 GL per year (with a long-term capacity of 40 GL) of Class A reclaimed water from Adelaide's Bolivar WWTP to farms 35 kilometres north on the Northern Adelaide Plains. Approximately 250 growers covering an area of 200 square kilometres use the recycled water for horticulture irrigation.

- The Water Corporation indicated in its submission that one area of scope for increased recycling is in the Carabooda agricultural district, which is sited near the proposed Alkimos wastewater treatment plant and could potentially use treated wastewater from the plant for irrigation. This issue is further discussed in section 6.6.
- The Chamber of Commerce and Industry supported the use of recycled municipal wastewater for agriculture:

CCI believes that there is no reason why all the municipal wastewater that is currently discharged into the ocean could not be recycled for use in agriculture, given the rising cost of food and energy in Western Australia. (Chamber of Commerce and Industry WA submission, p2)

Major on-site recycling

- The Sydney Olympic Park is an example of large scale recycling. The water reclamation and management system at the Park includes stormwater harvesting and treatment, sewage reclamation and treatment, and a dedicated supply system to utilise the treated stormwater and wastewater for toilet flushing, irrigation and operational wash-down activities. The system supplies around 500 ML of recycled water each year.

Sewer mining

- The Council House 2 building in the Melbourne central business district takes water directly from a nearby sewer and treats it for non-potable use within the building.

Larger residential third pipe schemes

- Perhaps the largest example of recycled water for domestic use in Australia is the Rouse Hill development in Western Sydney. Approximately 17,000 households now use recycled water through the use of dual reticulation, commonly referred to as a "third pipe" system. The third pipe system supplies recycled water for flushing toilets, watering gardens, washing cars and other outdoor purposes via a separate purple water pipe.
- The South West Development Commission advocated the separation of water supply systems into potable and non-potable networks.

In building any water supply grid significant questions arise about achieving critical mass size. This issue is significantly compounded if the proposed grid is operated solely on the basis of being for treated wastewater.

Where mains supply has been constrained to treated wastewater alone it faces difficulty in that its supply growth can only occur in parallel to the growth of wastewater which in turn constrains the operation from being able to commit to larger supply contracts and achieve scales of efficient operation quickly.

²⁵ The Virginia Plains Scheme cost \$55 million and was shared between the Commonwealth Government, which contributed \$10.8 million from the Building Better Cities Fund, \$574,000 from Landcare, \$7 million from private investors, \$7 million from the South Australian Government and the rest from SA Water.

To overcome this situation it is essential that any grid transporting treated wastewater should also be able to, at this time, access higher quality (though not treated to potable standard) water as an interim measure. The intent of this would be to create fit-for-purpose (non-potable) grids that long-term will supply increasing volumes of treated wastewater, although in the first instance this would involve the delivery of a mix of water qualities. This could be achieved through permitting a fit-for-purpose grid to access water that is reserved long-term (e.g. Yarragadee) for potable use as an interim measure while the total volume of wastewater grows with population increases.

Recommendation: That the ERA assesses the business case for fit-for-purpose water grids that will initially source a range of water supplies with the long-term goal of wastewater being the core source. (South West Development Commission submission, p3)

Large scale water recycling for domestic consumption

- Queensland is currently constructing the Western Corridor Recycled Water Project, which will be Australia's largest water recycling project and the first to use recycled water for drinking purposes. Recycled water will be supplied to power stations, industry, agriculture and the Wivenhoe public water supply dam, where it will be used to supplement the potable water supply. The project is expected to supply approximately 85 GL of recycled water per annum when the project is completed. The dam will act as an environmental buffer and the recycled water will be subject to further treatment such as ultra violet filtration and blending with existing non-recycled water.
- There are other large scale schemes in the world that recycle water for reuse as drinking water, including NEWater in Singapore, Water Factory 21 in California and the Goreangab Water Reclamation plant in Namibia. With the exception of Namibia, these schemes make use of an environmental buffer.
- The Water Corporation notes in its submission that the scope for the use of recycled water for drinking purposes will depend on community acceptance.

Industrial applications

- The Government indicated in the State Water Recycling Strategy that it supported the expansion of the Kwinana Water Reclamation Plant to 9.6 GL (from 6 GL at present).

Stormwater management

- The City [of Mandurah] is currently conducting a trial Stormwater Catchment Scheme at Egret Point to harvest and store stormwater for reuse on parks. The water is captured via runoff from the road drainage system and stored in underground reservoirs on site with a volume of 100 kL.²⁶ (City of Mandurah submission, p3)
- [T]he scope for stormwater recycling is much less as most is already recharged to local waterways and aquifers where it has environmental value. Stormwater is also rainfall dependent (less secure than wastewater recycling) and can be difficult and expensive to treat due to a wide range of contaminants including nutrients and petrocarbons. (Water Corporation submission, p8)

²⁶ A kilolitre (kL) is 1,000 litres of water.

3 Current Policy Settings and Directions

3.1 State Initiatives

Water recycling emerged as an important issue for Western Australia in 2001 in response to the drought. A water forum and symposium was held in 2002, partly to explore opportunities for water recycling in Western Australia. The outcome of these events informed the State Water Strategy released in Western Australia in February 2003. The State Water Strategy set a target to recycle 20 per cent of treated wastewater by 2012.

The most significant development since the State Water Strategy was released was the commissioning of the Kwinana Water Reclamation Plant in 2004, which uses wastewater from the Woodman Point wastewater treatment plant.

In addition, rebates for greywater reuse were introduced and a code of practice for reuse of greywater has been published by the Department of Health.²⁷

Further to the State Water Strategy, the State Water Plan 2007 increased the recycling target to 30 per cent of treated wastewater by 2030.

The State Water Recycling Strategy was published in June 2008. The following initiatives were included in the Strategy as ways to increase the level of water recycling in Western Australia in order to reach the 30 per cent target.

- Government supports the expansion of the existing Kwinana Water Reclamation Plant by 2010.
- Government will investigate the establishment of an industrial tariff to promote the efficient use of water and the use of recycled water by industry.
- Due to increasing pressure on our groundwater resources, the State Government is currently investigating the viability of horticultural precincts. Water from the new Alkimos Wastewater Treatment Plant has some potential for future use in horticulture and may be reserved for this purpose.
- A three-year trial of groundwater replenishment is being planned to commence in 2009....water from the Beenypup Wastewater Treatment Plant will be reserved for this purpose.
- ... an online Waterwise communities toolkit is being developed ... [which will provide information on] the availability of shallow groundwater, the availability of sources for recycled water, key land planning considerations, alternative water solutions including rainwater tanks, community bores, greywater and landscaping, streamlined application and approval processes. It is expected that the toolkit will be online by 2010.
- A review of Water Corporation charges for extending water infrastructure to new urban areas will be undertaken, with consideration given to reflecting the contribution of alternative water supplies.²⁸

²⁷ Department of Health (July 2002), *Draft Guidelines for the Reuse of Greywater in Western Australia*. See <http://www.health.wa.gov.au/publications/documents/HP8122%20Greywater%20Reuse%20Draft%20Guidelines.pdf>

²⁸ State Water Recycling Strategy, June 2008.

3.2 National Initiatives

National agreements between the Federal and State Governments play a significant role in water policy in Australia. Recent reforms have placed increased importance on the development and use of recycled water as an alternative water source.

In 1994, in response to concern about the state of many of Australia's river systems, the Council of Australian Governments (**COAG**) developed a national policy for the efficient and sustainable reform of Australia's rural and urban water industries. The strategic framework agreed to by the Government embraced pricing reform based on the principles of consumption-based pricing and full-cost recovery, the reduction or elimination of cross-subsidies and making subsidies transparent. The framework also involved the clarification of property rights, the allocation of water to the environment, the adoption of trading arrangements in water, institutional reform and public consultation and participation.

Implementation of the strategic framework was expected to result in a restructuring of water tariffs and reduced or eliminated cross-subsidies for metropolitan and town water services with the impact on domestic consumers of water services being offset by cost reductions achieved by more efficient, customer-driven, service provision.

In the case of rural water services, the framework was intended to generate the financial resources to maintain supply systems, should users desire this, and through a system of tradeable entitlements to allow water to flow to higher value uses subject to social, physical and environmental constraints. Where they have not already done so, States are to give priority to formally determining allocations or entitlements to water, including allocations for the environment.

Environmental requirements were to be determined on the best scientific information available and to have regard to the inter-temporal and inter-spatial water needs required to maintain the health and viability of river systems and groundwater basins. COAG also agreed where significant future irrigation activity or dam construction is contemplated, that in addition to economic evaluations, assessments will be undertaken to ensure that the environmental requirements of river systems can be adequately met.

The National Water Initiative (**NWI**) builds on the previous COAG framework for water reform.

The overall objective of the NWI is to achieve a nationally compatible market, regulatory and planning based system of managing surface and groundwater resources for rural and urban use that optimises economic, social and environmental outcomes. The multiple goals of the NWI are to:

- ensure healthy, safe and reliable water supplies;
- increase water use efficiency in domestic and commercial settings;
- encourage the re-use and recycling of wastewater;
- facilitate water trading between and within the urban and rural sectors;
- encourage innovation in water supply sourcing, treatment, storage and discharge; and
- achieve improved pricing for metropolitan water.

For metropolitan systems, the NWI (section 66(ii)) requires:

- 66(ii) development of pricing policies for recycled water and stormwater that are congruent with pricing policies for potable water, and stimulate efficient water use no matter what the source, by 2006.

The National Water Commission is in the process of developing pricing principles for recycled water and stormwater reuse to assist NWI parties to achieve their commitments under section 66(ii) of the NWI. The Commission has recently released its position on urban water pricing, with some reference to pricing for new water sources.²⁹

Urgent progress is required to improve pricing policies for recycled water and stormwater. Consistent with NWI commitments, pricing policies for recycled water and stormwater should be congruent with pricing policies for drinking water so as to stimulate efficient water use regardless of the source. Recycled water and stormwater re-use schemes need to be considered in a system-wide context and prices should reflect externalities and avoided or deferred costs. Prices for recycled water and stormwater should reflect underlying cost differences associated with providing products of different quality and fit for a range of different uses.

This inquiry is part of the State Government's implementation plan for the NWI in Western Australia, in which the Government committed to a review of pricing policies for recycled water and stormwater.³⁰

In addition, the Environment Protection and Heritage Council is developing a set of Australian guidelines for water recycling. These guidelines are designed to:³¹

provide an authoritative reference that can be used to support beneficial and sustainable recycling of waters generated from sewage, grey water and stormwater, which represent an underused resource. The guidelines describe and support a broad range of recycling options, without advocating particular choices. It is up to communities as a whole to make decisions on uses of recycled water at individual locations. The intent of these guidelines is simply to provide the scientific basis for implementing those decisions in a safe and sustainable manner.

The guidelines are being produced in two phases.

- Phase 1 was released in November 2006 and provides a framework for the provision of safe and reliable recycled water. Phase 1 focuses on on-site greywater recycling and large-scale wastewater recycling for non-drinking purposes.
- Phase 2 consists of three modules. Module I addresses recycled water for drinking and has been completed and issued. Modules II and III focus on stormwater reuse and managed aquifer recharge and are currently open for public comment.

²⁹ National Water Commission (July 2008), "Urban Water Pricing: National Water Commission Position", in *Approaches to Urban Water Pricing*, Waterlines Occasional Paper No.7, by Frontier Economics on behalf of the National Water Commission.

³⁰ Government of Western Australia (April 2007), *Western Australia's Implementation Plan for the National Water Initiative*, p50.

³¹ Environment Protection and Heritage Council, *National Water Quality Management Strategy: Australian guidelines for water recycling, Managing health and environmental risks (phase 2), Stormwater harvesting and reuse, Draft for public comment, May 2008, pg 1.*

4 Recycled Water Pricing

4.1 Terms of Reference

The Terms of Reference require the Authority to:

consider and develop findings on the circumstances in which recycled water prices should be regulated; and the recommended approach to any required regulation.

4.2 Background

All service providers in WA that are currently licensed to provide wastewater services either currently do, or could potentially, provide water recycling services. Current licensed wastewater service providers include the Water Corporation, City of Kalgoorlie-Boulder, Rottneest Island Authority, Pilbara Iron and 19 Shires. However, other service providers could conceivably also provide recycling services in the future.

The Authority currently provides advice to the Government on the regulated tariffs of the Water Corporation. The tariffs of the other licensed wastewater service providers are not regulated.

The situations in which further price regulation of water recycling could conceivably be applied relate to:

- sales of recycled water from wastewater treatment plants;
- sales of recycled water from large recycling plants to industrial customers;
- sales of recycled water through third pipe schemes; and
- developer charges in situations where water sensitive developments involving recycled water are being proposed.

This chapter considers the pros and cons of regulating recycled water prices in each of the situations referred to above.

4.3 Price of Recycled Water from Wastewater Treatment Plants

4.3.1 *Current Approach by the Water Corporation*

The only provider of recycled water that made a submission to the Inquiry was the Water Corporation. The Water Corporation has proposed that the price of recycled water from wastewater treatment plants be treated in the following way:

The Corporation does not believe that the efficient use of recycled water would be enhanced by a greater level of price regulation....The Corporation supports a “light-handed” approach to price regulation, where “regulation” requires adherence to specific principles that are approved by government, rather than regulation that sets prices for each scheme or sets a methodology or directly intervenes in commercial arrangements. The Corporation also supports the publication of the pricing principles. (Water Corporation submission, p1)

The Corporation prices recycled water based on the following guiding principles which are aligned to the principles outlined in the Water Services Association of Australia's Occasional Paper No. 12 "Pricing for Recycled Water" (February 2005).

- Prices for recycled water should be set within a price band, with (whole of system) incremental cost as the floor and willingness to pay (as defined by the lesser of stand-alone cost or by-pass price of the alternative) as the ceiling.
- Commercial judgments should determine whether prices are set at the lower end of the efficient price band (i.e. just covering system incremental costs) or towards the higher end (where recycled water users make an increasing contribution towards joint/common costs).
- Prices for recycled water should be set in a way that broadly tracks the price of substitutes, but not locking in artificially low prices for an unnecessarily long time into the future.
- Prices for recycled water should be set as part of any longer term pricing reform strategy encompassing the suite of products provided by the industry (rather than a short-term position based on the current charges for potable and other services).
- In the case of mandated targets, any subsidies provided to recycled water products at the expense of the broader customer base should be fully and transparently costed. Preferably, these subsidies should be paid from general revenue since they constitute a CSO.
- In some cases, efficient prices may require different prices for different users, reflecting different qualities of recycled water and associated costs of supply – which may vary by user and/or location – and willingness to pay. Failure to price differentially may result in viable recycling projects not proceeding.

In addition, the Water Corporation makes the following comments, which help to clarify its approach to pricing recycled water:

Where there is scarcity or potential scarcity, the resource should be managed and priced to achieve its greatest long-term value. (Water Corporation submission, p16)

The Corporation does not support a simple marginal cost pricing approach to reuse pricing. Such an approach does not take into account the value of the resource to the customer, their fair contribution to joint costs or the efficient allocation of the resource where the potential for recycling is limited and there are competing uses.

The Corporation's pricing policy for recycled water aims to achieve a positive contribution to the joint costs of a sewerage scheme where possible. The policy does not look at recycled water customers in isolation, and does not discriminate against other customers of the sewerage scheme in favour of recycled water customers. (Water Corporation submission, p3)

The Water Corporation indicated that there may be circumstances where consistent charging across customers is appropriate:

There will be circumstances where there are many customers receiving a similar service from a recycled water scheme. In these circumstances, a uniform service standard and price may be administratively efficient and an equitable means of recovering scheme costs....External oversight should be limited to any unresolved contractual dispute. (Water Corporation submission, p2)

The Water Corporation also comments that pricing should be cognisant of the best long term interests of communities.

As the value and the price of competing water sources continue to increase, the potential contribution to scheme costs of revenue from recycled water will increase. A potential distributional issue is who obtains the benefit of this increasing value. Care should be

taken to retain the long-term resource rights with the scheme owner so that all customers benefit from increases in resource value. Passing control to customers with low value but short-term opportunities not only leads to potential windfall gains, but is more likely to lock in lower value uses (watering ovals and golf courses) as these customers are likely to resist change (e.g. the reluctance of communities to allow irrigation water to be traded to higher value use due to local impacts).

(Water Corporation submission, p12)

The Water Corporation noted that in some instances it is at a disadvantage in negotiations because it is the recycled water customer who provides the least-cost method of wastewater disposal.

It should also be noted that there other circumstances, where the Corporation is limited in the alternative disposal methods available, where it is the recycled water customer who has the market power. (Water Corporation submission, p2)

Information from the Water Corporation provides the following case studies on how the Corporation sets its charges.

Case Study 1

An industrial customer was exceeding its water entitlement which had been obtained under a commercial water supply agreement with the Corporation. Even with measures in place for reducing water usage, the customer recognised that it needed to increase its water entitlement.

As an alternative to using scheme water to meet the additional water requirement, the Corporation presented the customer with an option to use recycled water from a wastewater treatment plant which was in close proximity. This treatment plant has an approved disposal method in place.

The proposed charges comprise:

1. recovery of the Corporation's capital expenditure, i.e. the Corporation will be constructing the reuse scheme to enable delivery of recycled water specifically for the customer.
2. recovery of operating costs of the reuse scheme, and
3. a product charge reflecting the customer's ability to make a contribution to the joint costs of the sewerage scheme and the potential scarcity of the recycled water as a resource (another customer had expressed a potential interest in the resource).

Case Study 2

The following is a case study of a recent recycled water agreement that the Corporation has entered into.

- A review of disposal options for a wastewater treatment plant identified that water recycling represented the most efficient option.
- In order to be able take the recycled water for irrigation purposes, a customer had to upgrade its facilities to comply with Department of Health and occupational safety and health requirements. The Corporation also had to construct infrastructure to deliver the recycled water to the customer.
- The agreement included a contribution from the Corporation towards the customer's upgrades and a loan [provided by the Corporation].
- The recycled water will initially be provided free of charge, e.g. have a zero resource value and no contribution toward the existing wastewater system.
- To recognise that the customer's financial position may change in the future, the agreement provides for an annual review to determine the customer's capacity to pay for the recycled water.
- The agreement provides that if a third party requests use of the recycled water whilst the Corporation is providing the recycled water free of charge to the customer, the customer will be provided the opportunity to accept and agree to the commercial terms of the request by the third party but if the customer does not accept these terms, the customer's entitlement will be reduced by the amount requested by the third party.
- In the event the customer's entitlement is reduced and the reduction impacts its ability to adequately irrigate, the Corporation will reimburse the customer for any part of the customer's reticulation upgrade which is rendered redundant, or on a proportionate basis, to the extent of the redundancy is caused solely by the reduction in entitlement. Any reimbursement will be included in the charges to the third party. This provision does not apply for a specified number of years of the agreement so as to give the customer the opportunity to become more financially viable.

Source: Water Corporation submission, p16-17

The submission from the City of Mandurah provides another illustration of how the Water Corporation currently sets recycled water charges.

[A]ny review should consider the extent of control over water infiltrated by Water Corporation (through a Managed Aquifer Recharge process) into an aquifer, but accessed by another party some distance from the infiltration point (how far from infiltration point does water cease to become 'owned' or controlled by Water Corporation and therefore not subject to competition and pricing inconsistencies). (City of Mandurah submission, p5)

Case Study 3

Water Corporation owns and operates the Gordon Road wastewater treatment plant (WWTP) in Mandurah. Wastewater from the WWTP is treated and filtered through fractured limestone to recharge the aquifer. This is a form of managed aquifer recharge.

The City of Mandurah approached the Department of Water for a licence to construct a bore and abstract groundwater for the purposes of reticulation of public open spaces. However, the Leederville aquifer in this area is fully allocated and there are restrictions on use from the superficial aquifer, which would not be sufficient to meet the City of Mandurah's irrigation needs.

The City of Mandurah wanted a guarantee that there would be sufficient water being infiltrated in the long term to meet their needs, which is not something that the Department of Water could provide. The Department of Water recommended that the City of Mandurah enter into an agreement with the Water Corporation to ensure that the quantity of groundwater being drawn by the City each year continued to be infiltrated by the Gordon Road WWTP to ensure the aquifer was not impacted by the abstraction.

The wastewater agreement between the City of Mandurah and the Water Corporation is for the supply of 110 ML per year (abstracted from the groundwater bores by the City), at a cost of 18c/kL to the City (around \$20,000 per year). This price was based on the price which another major potential customer at the time was willing to pay for infiltrated wastewater from the plant.

The agreement is conditional on the infiltration of sufficient treated wastewater from the plant. Currently, the infiltration rate from the plant is around 2,700 ML per year (7,500 kL per day). The Department of Water estimates that 80 per cent of local aquifer recharge is from the infiltration from the plant.

Under current legislation, the Department of Water can only license groundwater abstractions, and not injections into aquifers. Thus, the requirement for City of Mandurah to enter into an agreement with the Water Corporation is the only mechanism available to the Department of Water to ensure that groundwater abstractions and injections are balanced. New legislation currently being drafted is expected to address this matter.

The Authority also received two submissions in which confidentiality was claimed by the parties on the grounds of commercial sensitivity (for all of one submission and parts of another submission). These confidentiality claims were accepted by the Authority. One of the submissions provided the details of negotiations where the submitter claimed the Water Corporation was using market power to influence negotiations. The Authority has investigated these claims and has used this analysis to inform its draft recommendations.

4.3.2 Analysis

In considering the issue of pricing recycled water, the Authority has taken the Water Corporation's proposal and analysed whether this proposal is appropriate, in light of information provided in submissions and other analysis conducted by the Authority.

One of the guiding principles that the Authority has used in coming to a view on recycled water pricing is that the pricing should be consistent with what would be expected to occur if the market for recycled water were competitive, with possible adjustments to the price to reflect externalities or social objectives. In addition, the Authority has been guided by the need to ensure consistency across the different ways in which recycling projects could proceed. For instance, a customer who is interested in using recycled water in their operations should face a price signal that is cost reflective, whether they purchase water from the owner of a wastewater treatment plant or decide to gain access to the

wastewater network under a third party access regime and recycle the wastewater themselves. That is, recycled water pricing should be consistent with access pricing.

For example, under a third party access regime, alternative providers of wastewater recycling services would be able input wastewater (e.g. from businesses, industry or households) into the wastewater network, pay the network owner a charge to transport the wastewater, take out the wastewater, treat it and sell it on to recycled water customers.

In addition, an access regime could also include provisions to enable third parties to extract wastewater from the wastewater network, treat it and sell the recycled water on to customers (this is known as “sewer mining”).

The following analysis first considers how recycled water prices would be set in a hypothetical competitive market (where third party access is also possible), and then considers whether these prices should be adjusted to account for externalities and social objectives.

Pricing in a Competitive Market

The disposal of treated wastewater is potentially a competitive market. Treated wastewater can be either discharged into the environment or sold to recycled water customers. In addition, competition can be reinforced by a third party access regime.

A competitive market would expect to result in recycled water prices with three components:

- a charge associated with the costs of delivering the recycled water to the customer, including any incremental costs that might be incurred in treating the wastewater to be fit for purpose;
- a negative adjustment in price to take into account any costs that are avoided as a result of selling the recycled water. For example, the operating costs of discharging the wastewater to the environment would be avoided; and
- if the amount of wastewater available to be recycled is less than the demand for the recycled water, then an additional premium would be added to the price to reflect its relative scarcity.

Avoided Costs

The approach of taking into account avoided costs and direct costs is consistent with accepted principles for access charging in the water and wastewater sector.³² Previous advice by the Authority on third party access pricing indicated that a “retail minus” approach would be appropriate.³³ Under such an approach, prices for parties accessing the wastewater network would take as their starting point the retail price of the wastewater network owner, and subtract from that the costs that are (or could be) avoided by the wastewater network owner in no longer having to provide some services. There are several considerations in the determination of access prices.

- In calculating the avoided costs, the savings in source development costs would not be included. In a competitive bulk water market, an existing bulk water

³² These principles have been confirmed in appeals to the Australian Competition Tribunal. See the case of Services Sydney, ACCC Arbitration Report, 19 July 2007.

³³ Economic Regulation Authority (2008), *Final Report: Inquiry on Competition in the Water and Wastewater Services Sector*, Chapter 4, Third Party Access.

provider would not pay the new entrant (the recycled water supplier) the amount of avoided costs that results from losing their market share.

- Any costs of water and wastewater transportation, distribution and treatment avoided by the monopoly network operator, however, would be deducted from the access charge.
- Note that the party seeking access would be expected to recover the retail price from their own retail customers (less an incentive payment to get them to switch away from the wastewater network owner), which means that the residual charge would be the direct cost less any avoided costs. A potential user of recycled water would be able to compare the cost associated with purchasing recycled water directly from the wastewater treatment plant with the cost associated with getting access to the wastewater and treating the wastewater themselves.

Scarcity Pricing

The best way to determine a scarcity price would be to tender the rights to the wastewater resource. If there is no scarcity (if supply of wastewater exceeds demand), then the scarcity component of the price should be zero. If there is a scarcity, then the scarcity component of the price would reflect the value of the wastewater in its highest value use. A tender process could involve two stages:

- 1) Establish whether there is scarcity. For example, in the case of infiltrated wastewater from a wastewater treatment plant, the plant owner could seek registrations of interest for the use of groundwater up to the amount of infiltration from the plant.
- 2) If the registrations of interest indicate scarcity, the plant owner could conduct a tender and set the price of the wastewater resource at the price set by the highest bidder.

If all of the resource has been allocated, there is the potential for a secondary market, whereby other users could buy the rights to groundwater from existing users.

In a competitive market, it would be expected that any premium arising from the scarcity of wastewater available for recycling would be largely captured by the households and businesses discharging their wastewater into the sewer. This could be seen in the case of multiple access seekers who could enter into a bidding war to encourage retail customers to sell wastewater to their particular project.

- The scarcity premium would not be captured by the wastewater network owner, as it would only be entitled to recover the efficiently incurred costs associated with the transportation and treatment of wastewater. The regulatory treatment of recycled water revenue would account for any scarcity revenue by netting off the recycled water revenue against the costs of providing the regulated service (to ensure retail customers are the beneficiaries, or alternatively to reduce Community Service Obligation (CSO) payments).
- On this point, it is important to note that the wastewater treatment plant and network are treated by the Authority in its pricing advice to government as regulated assets, and the costs are fully reflected in the Authority's tariff recommendations. An important regulatory principle is that, in general, where service providers receive revenue that exceeds the costs of providing regulated services, and the additional revenue was generated using those regulated assets, then the tariffs are reduced (or CSOs reduced) to equate revenue and costs.

- While there may be an argument for allowing some of the scarcity premium to be retained by the service provider, to provide an incentive to the service provider to seek out recycling projects, there are other ways of providing such incentives, such as setting recycling targets (see section 6.3).

Pricing Principles

As indicated above, the Water Corporation has proposed that the price for recycled water from a wastewater treatment plant be a negotiated outcome bounded by the range of the 'whole of system' incremental cost as the floor and the stand-alone cost or by-pass prices as the ceiling. The Water Corporation also proposes that the price broadly track the price of substitutes and be able to be adjusted in future if recycled water becomes scarce. In addition, the Water Corporation proposes that recycled water customers make a contribution to joint costs.

In line with the previous discussion on scarcity pricing, the Authority agrees with the Water Corporation that where wastewater is scarce, prices of recycled water can be above incremental cost to reflect the scarcity, and the additional revenues used to benefit network customers.

However, where there is no scarcity, prices should not be set above incremental costs and recycled water customers should not make any contribution towards joint costs.

- Pricing above incremental cost where there is no scarcity could result in recycling projects not proceeding, even though they could lower the overall costs of water and wastewater provision.
- The joint costs associated with providing the wastewater network are not costs that have been caused by the recycled water customer, and are therefore not appropriately recovered from those customers. Rather, recycled water customers can reduce costs to users of the network. For example, removal of wastewater by recycling customers can free up capacity on the wastewater network and can delay the need to increase the capacity of the wastewater system.

Establishing a set of principles to guide the negotiations of recycled water contracts would have benefits. The main principle that would be applied is that the price of recycled water should be based on the incremental direct costs of providing the service less any avoided or avoidable costs of providing natural monopoly services. A scarcity premium should only be charged when the demand for wastewater exceeds its supply.

The guiding principles would complement, and may be superseded by, pricing principles that would be established under a third party access regime.

Adjusting the Price for Externalities

Externalities are present when the well-being of third parties is impacted by the amount of a good or service that is produced.

The Water Corporation provided a range of potential externalities:

There are a number of positive externalities associated with recycled water:

- Avoidance / deferral of need to build a new potable water source such as a dam where potable water prices don't capture the added cost;
- Reduce pressure on natural systems;

- Community preference;
- Reduction in the release of effluent to oceans.

There are also negative externalities:

- Increased public health risk associated with incorrect use and management;
- The application of recycled water can impact the environment, particularly due to nutrients and other contaminants;
- Where carbon costs are not included, recycling can be more energy intensive than other water sources.

(Water Corporation submission, p11)

The Water Corporation is not in favour of incorporating externalities into recycled water prices:

The Corporation does not support the regulation of water recycling prices to account for externalities. Negative externalities are normally best managed through specific regulation (e.g. health, environment) and are then directly incorporated into the cost of the project. The Corporation's preference is for positive externalities to be identified and dealt with through specific project subsidies (e.g. CSO payments), but concedes that an alternative is for the cost to be passed on to the entire customer base. It should be noted that specific price regulation for positive externalities would require similar subsidies or cross-subsidies. (Water Corporation submission, p3)

Other submissions were in favour of price regulation to reflect environmental externalities.

Pricing needs to recognise the significant environmental benefits that arise from use of recycled water that avoids discharges into the environment.

(Kwinana Industries Council submission, p1-2)

It is acknowledged that some positive externalities ... exist from an increase in the use of recycled water and this supports recycled water prices being adjusted to reflect these externalities (i.e. internalise the externality). However, it is difficult to isolate an efficient method of determining the cost impact of some environmental externalities or for other externalities to ensure an appropriate monitoring arrangement to determine whether they are reflected in the price. The ERA is encouraged to further investigate a methodology of quantifying the value of externalities and how they can be included in recycled water pricing.

...

Within the context of regulation for externalities of recycled water, the costs associated with the implementation of health and environmental regulation should also be accounted for within the pricing structure. For example, as mentioned in the issues paper, the Health Department has published a code of practice for reuse of greywater which includes both health and environmental requirements for household greywater recycling.

It is also important to note that a requirement of the NWI is to recover the cost of environmental externalities, although no State has successfully included this in the cost of water. Perhaps in the interim, a proxy could be applied to recover some of the costs of externalities, until a method of quantifying these externalities is developed.

(Department of Treasury and Finance submission, p3)

The Department of Treasury and Finance also noted that some externalities have already been 'internalised' into charges, which means that no additional adjustment to prices should be used.

It is noted that positive externalities exist through a reduction in ocean discharge and a lower volume of water being processed at major wastewater treatment plants, where a

private provider uses the Water Corporation's wastewater. However, if this benefit is reflected in the cost of wastewater then it is internalised. In contrast, there are negative externalities such as greenhouse gas emissions from pumping and reverse osmosis among other processes. The cost of greenhouse gas emissions is soon to be included in the cost of energy, which could translate into an increase in the cost of recycled water. However, it is difficult to quantify the magnitude of these externalities. With carbon emissions trading, this cost will be explicit. (Department of Treasury and Finance submission, p3)

As indicated in submissions, the environmental externalities may be positive, such as a reduction in the release of effluent to oceans and the reduced pressure on natural systems if recycled water displaces groundwater abstraction. The environmental externalities may also be negative if the recycled water is not treated to appropriate standards or if the carbon emissions associated with recycling are not accounted for and are higher than providing the water in a less energy intensive way.

If these environmental externalities have a positive or negative impact on the well-being of others, such as recreational users of the ocean, residents surrounding wastewater treatment plants, or members of society who value the environmental improvement, there may be a case for adjusting the price of recycled water to reflect this positive impact.

The Authority agrees with the Department of Treasury and Finance that establishing the net impact of environmental externalities is an issue that requires further analysis, and the Authority welcomes further advice on this matter. However, at this stage the Authority is not in a position to be able to quantify the implications of environmental externalities on recycled water prices. The Authority will consider this matter further as it prepares the final report.

Adjusting the Price to Achieve Social Objectives

A number of submissions commented on whether recycled water prices should be adjusted to achieve social objectives.

The Department of Treasury and Finance made the following comments:

In general, it is recommended that social objectives are best not delivered through water pricing. It is important that voluntary recycled water customers pay the full costs of their water sourcing decisions and the social objective achieved through different means. (Department of Treasury and Finance submission, p4)

It is considered that there are better, more targeted approaches to achieve social objectives set by Government than using price subsidies. For example a rebate system would achieve the social objective and not distort price signals. Price subsidisation should be avoided, as it does not send appropriate price signals to the subsidised customers, which in turn, promotes inefficiency and can also result in customers undeserving of subsidisation receiving discounts.

(Department of Treasury and Finance submission, p5)

The Department of Treasury and Finance also commented that if recycled water were the only water available then the Uniform Tariff Policy could be applied:

The applicability of the UPP to recycled water depends on the chosen use of recycled water. If it is a component of the IWSS or a substitute for potable water then, the same policies applied to other potable water supplies should be applicable. On the other hand, if recycled water is used for non-potable use such as for industry, then the UPP should not apply. (Department of Treasury and Finance, p4)

The City of Mandurah argued for subsidies to encourage recycling:

Any pricing policy should provide incentives to take up recycled water options that use water effectively and efficiently measured against community benefit. Some suggestions are to use a Reverse Sliding Scale, offer subsidies if you 'sign up' in the next 10 years or subsidies to reflect the community benefit (as opposed to private sector, profit generating usage). Policy should also encourage partnering between all levels of Government that increases the availability of infrastructure, the use of current and future technology and community capacity building. (City of Mandurah submission, p4-5)

The City of Mandurah also argued for greater subsidies to go to community projects rather than businesses.

The City submits that the purpose of water usage should be factored into pricing policy and structure (community based outcome vs private business).

Policy considerations should include the distinction between community and business use, purpose of water usage, externality benefits that [Local Government Authorities] provide – with tariffs / pricing to reflect these benefits.

Commercial users may be able to demonstrate an offset with regards to providing a benefit to community by way of investing in / contributing to infrastructure and / or water sensitive urban design...

Provision may be considered for commercial organisations to receive lower tariff if they can demonstrate a contribution to the community. This would involve a reporting function. (eg Alcoa may contribute to ongoing irrigation or other costs involved in the installation or continued provision of an active reserve).

(City of Mandurah submission, p5-6)

The submission by the City of Mandurah identified the benefits to local communities from the use of recycled water for purposes such as irrigation of parks, ovals and public open spaces. Further, the City submitted that it can not afford to pay the higher water prices that can be paid by industry, and that some recycled water should be set aside for community purposes.

In response to the issues raised by the City of Mandurah, a key point to note is that if there is no scarcity in recycled water, then the charge for the recycled water would only be the direct incremental costs of accessing the recycled water, net of any avoided costs to the recycled water provider.

However, if recycled water is a scarce resource, there are several reasons why it should not be provided at subsidised prices for community use.

- First, it is important that all options for water supply or demand reduction are assessed on a level playing field. Setting an artificially low price for recycled water would favour this option relative to other approaches (for example, grey water recycling, or water sensitive urban design) that may be more cost effective.
- Further, communities derive a private benefit from the greening of public open spaces and should be prepared to pay an amount up to the value of that private benefit. If the private benefit derived is less than the cost, then a case would need to be made to fund this difference through a CSO. However, as these benefits are largely private, it would be difficult to justify that they should be funded by other tax payers rather than the local government authority.

Other Issues Raised in Submissions

Submissions also commented on the form of regulation that should be applied to recycled water pricing. The Department of Water provided a range of options, without indicating its preference at this stage:

If regulation is necessary, this could take a range of forms. The simplest option is minimal regulation: to allow utilities to sell recycled water by commercial contract with a negotiated price that reflects supply and demand, and the availability of alternative sources of water at competitive prices.

Under a commercial contract price regulation can be light handed if there is no indication of market failure caused by misuse of market power. If there is indication or evidence that market failure is hindering the development of recycled water, then further regulation may be warranted.

Alternatively, recycled water tariffs could be set individually using a building block approach (operating cost plus fixed return on investment). However this could be administratively burdensome and inefficient, especially for smaller recycling schemes.

In between these two options, the Department of Water sees a number of potential measures that could be examined:

- public reporting of costs and prices to allow scrutiny
- establishment of principles for pricing of recycled water
- dispute resolution or appeal mechanisms
- regulated methodology for the calculation of charges (as opposed to the setting of specific charges)
- regulation of designated high value or high demand schemes.

These measures could be applied individually or in combination.

(Department of Water submission, p6)

The Water Corporation does not support a greater level of price regulation but accepts that adherence to a set of pricing principles would be appropriate.

The Corporation does not believe that the efficient use of recycled water would be enhanced by a greater level of price regulation....The Corporation supports a “light-handed” approach to price regulation, where “regulation” requires adherence to specific principles that are approved by government, rather than regulation that sets prices for each scheme or sets a methodology or directly intervenes in commercial arrangements. The Corporation also supports the publication of the pricing principles. (Water Corporation submission, p1)

In addition, the Water Corporation proposes an external review mechanism.

In a manner similar to the application of the Corporation’s framework for negotiating water supply agreements with major consumers, the Corporation is comfortable with an external review of its pricing policy for recycled water and how it is applied. (Water Corporation submission, p2)

The Water Corporation’s views appear to be supported by the Department of Treasury and Finance.

The introduction of a set of pricing principles or guidelines is preferred rather than any formal regulation of recycled water prices except where there is a monopoly provider or a provider with a degree of monopoly power, which is misusing its market power. If guidelines were to be introduced it is recommended that they are in accordance with the

principles of the NWI and the 1194 COAG Water Reform Framework. More specifically guidelines should include the following:

- prices for recycled water should be set to recover the full cost of the implementation of the recycled water scheme to send the appropriate signals to customers, and they should also be adjusted for avoidable costs and externalities where possible;
- any regulation or guidelines should promote economic efficiency and not be restrictive. Guidelines should also allow for flexibility in pricing arrangements, catering for different pricing arrangements for different types of recycled water projects;
- prices should be set within the bounds of other water prices and also not allow for any cross-subsidisation between recycled water customers and other water customers; and
- guidelines should also ensure that price setting is transparent and administratively simple where possible.

(Department of Treasury and Finance submission, p5-6)

The ERA may also wish to consider the development of pricing guidelines, which translate the pricing principles of the NWI and COAG Water Reform Framework into practical assistance for local councils in the valuation and costing of its recycled water services to ensure ongoing financial viability. This would include an appropriate calculation of avoidable cost of ocean discharge and a reduction in the volume of water being treated at wastewater treatment plants.

(Department of Treasury and Finance submission, p2)

If through [the monitoring of recycled water prices] it is discovered that monopoly rents are being achieved, then service providers could then be subject to price regulation or at least pricing inquiries, which report to the Government.

(Department of Treasury and Finance submission, p2)

There are a number of practical difficulties associated with the Government setting recycled water prices. Such difficulties include:

- the wide range of water recycling services (typically, prices are regulated for services that are relatively homogenous within a scheme); and
- the cost of the water recycling service will vary depending on the particular circumstances that arise during the negotiation (typically, prices are regulated for services that have costs that can be established in advance).

It would be appropriate, as recommended by the Water Corporation and Department of Treasury and Finance, to establish a set of pricing principles to guide commercial negotiations.

On the basis of the preceding discussion, the principles would require the recycling service provider to price on the basis of the direct costs incurred in providing the service, less any costs associated with the wider provision of water and wastewater services that are avoided or will be avoided in the future, and a premium in the case where there is a scarcity in wastewater.

Draft Recommendation

- 1) Recycled water from wastewater treatment plants should be priced to reflect the prices that would emerge under a competitive market. These prices would have three components:
 - A charge associated with the costs of delivering the recycled water to the customer, including any incremental costs that might be incurred in treating the wastewater to be fit for purpose.
 - A negative adjustment in price to take into account any costs that are avoided as a result of selling the recycled water. For example, the operating costs of discharging the wastewater to the environment would be avoided.
 - If the amount of wastewater available to be recycled is less than the demand for the recycled water, then an additional premium would be added to the price to reflect its relative scarcity. The premium should be determined by a neutral auctioning process.

These guiding principles would complement, and may be superseded by, pricing principles that would be established under a third party access regime.

4.4 Price of Recycled Water from Large Recycling Plants to Industrial Customers

This section considers whether the price of recycled water from large recycling plants should be regulated.

4.4.1 *Water Corporation Submission*

The Water Corporation argues for maintaining pricing flexibility in its commercial negotiations with major customers, including customers of the Kwinana Water Reclamation Plant.

The Corporation has been supplying water from its monopoly infrastructure in country areas to major customers under commercially negotiated arrangements, i.e. non by-law charges, in accordance with its Major Consumers Framework, for almost half a century. This Framework entails guidelines approved by government which has not required independent regulation.

From a public policy criteria, the pricing principles contained in the Framework:

- are clear in its rationale and objectives;
- send efficient price signals which reflect variations in the costs of servicing different locations;
- maintain equity between similarly situated customers;
- ensure fair, cost reflective charges from monopoly infrastructure; and

- are applied consistently to all major customers in country areas.

In a manner similar to the application of the Corporation's framework for negotiating water supply agreements with major consumers, the Corporation is comfortable with an external review of its pricing policy for recycled water and how it is applied.

The Corporation does not support regulation that sets a methodology or directly intervenes in commercial arrangements. Our experience in negotiating with major water customers and for recycling schemes such as the Kwinana Water Reclamation Plant (KWRP) is that the outcome of negotiations for both parties would be compromised if the Corporation was not free to negotiate to the specific circumstances of each customer.

(Water Corporation submission, p9)

4.4.2 Other Submissions

Kwinana Industries Council indicated that the Water Corporation's approach to pricing the Reclamation Plant is of concern.

The applicability of a base charge to gain access to recycle water in the absence of real competition for its use needs to be examined. Such a charge has the potential to adversely influence the development of recycle water use.

(Kwinana Industries Council submission, p2)

The Department of Treasury and Finance, however, notes that the higher price of water from the plant reflects the higher water quality and treatment costs of the recycled water produced.

Industry may require higher quality water than that which is available through mainstream water supplies. The high treatment costs of this better quality water should be reflected in the cost of the water to industry. The advantage to industry of purchasing water from the Kwinana Reclamation Plant and the higher costs of this water for example would necessitate a different level of prices for this higher quality water. Flexibility for the Water Corporation to negotiate commercial arrangements for large customers in these circumstances is supported, so long as it is consistent with [recycled water] pricing principles.

(Department of Treasury and Finance submission, p7)

Kwinana Industries Council also raised concerns about the Water Corporation's incentive to expand the Reclamation Plant rather than consider other options.

Water Corporation is in a dominant market position to determine the expansion of recycle water use in the Kwinana Industrial Area. They have a vested interest in securing contracts for supplies of Kwinana Water Reclamation Plant water and may use their position to influence the development of other options such as [Managed Aquifer Recharge]. (Kwinana Industries Council submission, p2)

The Kwinana Industries Council provided an example of the impact of recycling projects on the costs of wastewater disposal.

Pricing should reflect the value to the primary wastewater infrastructure owner of third parties using recycled water as it leads to deferment of major capital expenditure on duplicating or upgrading the infrastructure for wastewater disposal. For example the Kwinana Water Reclamation Plant takes its source water from the SDOOL [Sepia Depression Ocean Outfall Line] and this creates space (additional volume capacity) in the SDOOL for additional sewage connections and defers major cost of duplicating the SDOOL when it reaches capacity.

Pricing needs to recognise the significant environmental benefits that arise from use of recycled water that avoids discharges into the environment. (Kwinana Industries Council submission, p1)

4.4.3 Assessment

The main issue in this section is whether the Government should regulate the price of recycled water from Water Corporation's Kwinana Water Reclamation Plant (KWRP).

In general, price regulation may be considered in situations where there is/are:

- market power by a service provider, which can lead to prices being higher than would be achieved in a competitive market;
- externalities, which are present when the well-being of third parties are impacted by the amount of a good or service that is produced; or
- social objectives, which cannot be achieved through non-price measures (such as welfare payments).

Market Power

Market power generally exists where there are few, if any, substitutes for the good or service that is being produced and where it is not feasible for alternative businesses to enter the market (for example, due to the scale of the investment required).

In relation to whether there are any substitutes for KWRP water, it is clear that the industrial customers have the option of using scheme water.

In relation to whether alternative businesses could enter the market, large recycling plants are assets that could potentially be constructed by the private sector. However, it is important that a State-based access regime be introduced to provide competitive pressures on the pricing policies of incumbent recycling plant owners. (Third party access is considered further in section 6.7.)

There is no indication from the Authority's analysis that the Water Corporation is receiving a rate of return that is above what is warranted given the riskiness of the investment (the risks are associated with signing up customers who could otherwise use alternative water supplies, such as scheme water). Indeed, analysis by the Authority indicates that Water Corporation will make a lower rate of return on its KWRP investment than it receives on its investments in regulated assets. This analysis assumes that the plant continues to be fully utilised, operating expenditure is constant in real terms, and revenue continues at levels similar to the existing take or pay contracts.

Overall, the Authority's draft finding is that there is little justification for regulating prices for the KWRP on the grounds of market power.

Externalities

Recycling schemes will generally reduce the amount of treated wastewater that is discharged into the ocean. If this reduction in discharge has a positive impact on the well-being of others, such as recreational users of the ocean, residents surrounding wastewater treatment plants, or members of society who value the environmental improvement, there may be a case for reducing the price of recycled water to reflect this positive impact.

According to the Water Corporation, the KWRP has resulted in one major customer reducing its discharge into Cockburn Sound. However, given that the company had approval from the Department of Environment to discharge into Cockburn Sound, there would not appear to be any grounds for subsidising the price of water from KWRP to reflect the reduction in the externality.

Another type of externality from the KWRP is the benefit to Perth households from the reduced risk of higher-level watering restrictions as a result of KWRP reducing the demand for scheme water. However, any new source would provide this benefit to Perth households. It is unlikely that Perth households would be willing to contribute to the cost of the KWRP (as opposed to other options) to receive this benefit. Rather, Perth households would expect the risk of higher-level watering restrictions to be addressed by the Water Corporation in the most cost-effective way.

Overall, the Authority's draft finding is that there are no grounds to regulate prices for large recycling plants on the basis of externalities.

Social Objectives

The Authority invites interested parties to present their views about whether there are any social objectives that are achieved by large recycling plants, such as the KWRP, that justify the payment of a Community Service Obligation payment to the provider of recycled water. At this stage, the Authority does not consider any social objectives would be met by such a subsidy.

However, the Authority is aware that the Federal Government has awarded the Water Corporation a \$5 million grant to support the expansion of the KWRP. The media release by the Minister for Climate Change and Water, which announced the receivers of the grants, indicated:

"The National Water Security Plan for Cities and Towns will help communities improve water efficiency and develop new sources of water.

"The plan is designed to help smaller communities make their existing water infrastructure more efficient or find new sources of water supply.

"The Government will also work with local water authorities to minimise the loss of valuable water resources by providing funding for practical projects that save water."³⁴

It is not clear whether the \$5 million grant is intended to reduce the prices for the KWRP customers or to improve the rate of return on the project.

Draft Recommendations

- 2) The price of water from recycling plants that are not providing a service to regulated customers is a commercial matter between the service provider and its recycled water customers.
- 3) The Kwinana Water Reclamation Plant should be treated as a commercial venture between the Water Corporation and industrial customers, without any regulatory oversight of prices.

³⁴ Senator the Hon Penny Wong, Minister for Climate Change and Water (13 May 2008), *Media Release*.

4.5 Price of Recycled Water Delivered Through Third Pipe Schemes

The key issue in the pricing of recycled water services through third pipe schemes is that where customers have no alternative water supply, some form of pricing oversight may be required to ensure that prices are cost reflective. For this reason, regulators in New South Wales and Victoria have limited their direct involvement in recycled water regulation to the regulation of developer charges and to setting prices for large third pipe schemes.

For example, the Independent Pricing and Regulatory Tribunal (**IPART**) sets the recycled water price for the third pipe scheme at Rouse Hill in Sydney. Sydney Water provides 1.8 GL per annum of recycled water to over 17,000 customers in Rouse Hill. The recycled water price for Rouse Hill is set to fully recover the costs of the scheme, based on forecasts of recycled water sales, operating costs and capital expenditure related to the scheme.

A third pipe scheme which is being developed in Western Australia is that of Gracetown (see Case Study 4).

Case Study 4. Gracetown

Gracetown is a coastal town 15km from Margaret River in the south west of WA. It does not have a licensed water provider, reticulated water or a sewerage system. Local residents rely on rainwater tanks and septic tanks.

LandCorp is planning and funding a new development with 140 residential lots in Gracetown (almost doubling the current town's size), as well as a 50-key tourist accommodation site.

Following expressions of interest, LandCorp nominated United Utilities Australia (UUA) as the preferred water service provider to design, build and operate a reclamation water system that will provide used water (sewage) collection and treatment, and a non-drinking reclaimed water supply to Gracetown. The reclaimed water service will supplement the potable supplies from each dwelling's rainwater tank.

The water supply options were selected on the basis of community consultation and investigations into a range of alternative supply options. Problems with groundwater contamination from septic tanks have meant that these are not a viable option for future sewerage management.

Under the new scheme, used water from homes will be collected and treated to Class A+ standard at a new water reclamation plant. The treated water will be delivered back to the town through a reticulated pipe network for non-drinking use in homes (e.g. laundry, toilets, and gardens) and for fire fighting. It is anticipated that during winter months surplus reclaimed water will be used for aquifer recharge and flushing. Drinking water will continue to be self-supply through the use of rainwater tanks. Water efficient appliances and a 45,000 litre tank will be required for each new household constructed.

The new scheme will apply to both new homes and existing homes. While all new homes will be designed and fitted for both services, existing homes would need to be retrofitted. Connection of existing homes to the new scheme will be on a voluntary basis.

The costs of the scheme are being developed but it is anticipated that the rates will be comparable to those of similar locations. As the services would be provided by a private service provider, there is currently no CSO funding available to subsidise costs to customers.

Source: LandCorp

4.5.1 Submissions

The Department of Treasury and Finance highlighted the potential for market power when third pipe schemes have been installed.

A particular example where the Water Corporation has monopoly power in recycled water is Brighton residential estate. The Water Corporation is the sole provider of recycled water services to this area, where recycled water is provided to landowners for non potable use. While landowners choose to live in this area, the use of recycled water as an alternative source is not entirely optional. Other factors may have more weight in the decision to live in this location, including the geographical location and affordability. This gives some pricing power to the Water Corporation (who provides the water services to this area) as landowners have no choice but to utilise the recycled water infrastructure when they purchase land in the area. (Department of Treasury and Finance submission, p1)

Water Corporation submitted that it is not in favour of applying the particular approach adopted by IPART in the case of the Rouse Hill Development in Sydney:

Very large schemes in the Eastern States have adopted a pricing approach of taking a percentage of the by-law potable water price, with any shortfall in costs being met by the utilities general customer base, e.g. IPART determined price of recycled water for the Rouse Hill Development Area to be 80% of potable water price. The Corporation does not support this approach, and it should only ever be considered by Government on a project basis, not as a general pricing principle. (Water Corporation submission, p2)

4.5.2 Assessment

In situations where customers do not have an alternative supply option, some form of regulatory oversight of prices may be required to ensure that the rate of return is not unreasonably high. Conversely, third pipe recycling projects which are not a monopoly service would not require regulatory oversight.

In the case of Gracetown, households in the new development will not have a choice of service provider, although existing households would have the option of continuing with their current sewerage and water supply systems (i.e. septic tanks and rainwater tanks). Regulatory oversight of prices for connected households would appear warranted.

In the case of Brighton Estate, the Water Corporation provides drinking water for use inside homes and non-drinking water through a separate pipe system for use on gardens.

- Residents of the estate pay an annual service charge for the non-potable water, regardless of whether or not they are connected to the non-potable system (currently \$65.15 for lots smaller than 400m² and \$130.30 for lots larger than 400m²). This charge is in addition to the annual service charge for potable supply (\$180.50).
- Customers are only metered for their potable water usage and pay the standard metropolitan usage charges. There are no usage charges on the non-potable water.

The Authority agrees with the Department of Treasury and Finance that the use of the third pipe scheme in Brighton is not entirely optional, particularly given that Brighton Estate residents cannot disconnect from the scheme or switch to scheme water for outdoor use. Also, unlike major industrial customers, new customers who buy existing homes in the estate are unable to negotiate the terms and conditions of their recycled water supply.

The Authority has reviewed the Water Corporation's charges for Brighton Estate and established that the Water Corporation would be generating a rate of return of 28 per cent (real pre-tax) on their project.³⁵ The Authority considers that this rate of return is very high for the risks associated with the project.

On the issue of charging residents who are not connected to the non-potable supply system the annual service charge for non-potable supply, it is difficult to see how this can be justified. If the non-potable supply network were provided by a third party, the third party would not be able to charge residents who are not connected. For example, existing households in Gracetown who choose not to connect to the proposed recycling scheme would not be charged for the service.³⁶

Pricing oversight of the Water Corporation's charges for the Brighton Estate third pipe scheme would also be warranted and could be included as part of the periodic review by the Authority of the Water Corporation's tariffs.

Regarding the Water Corporation's comments on the pricing of recycled water services to Rouse Hill, IPART's decision in 2006 to set the recycled water prices at 80 per cent of the potable water price represented a significant increase in recycled water usage charges, which had been set low to encourage the use of recycled water and did not fully recover the costs of providing recycled water service. The current tariffs are set on the basis of recovering the forecast costs of operating the scheme.³⁷

Draft Recommendation

- 4) In the case of third pipe schemes, where services are provided by a monopoly provider and customers do not have an alternative supply option, some form of light-handed regulatory oversight may be required to check that the rate of return is not unreasonably high.
- 5) Analysis of the Water Corporation's non-potable supply charges to residents of Brighton Estate indicates that the rate of return appears very high relative to the risks of the project.

4.6 Price of Recycled Water in Developer Charges

Service providers may be able to use market power in the case of new developments that are designed to be water sensitive through their use of recycling schemes (for example, third pipe systems). The market power could theoretically be represented in a service provider not providing a discount to developers even though the recycling scheme lowers the cost of the water infrastructure required to service the development.

³⁵ It appears that the Water Corporation had incorrectly required customers to pay for the tax implications of the transaction that was entered into with the developer.

³⁶ However, projects where customers can choose whether or not to connect to a service would require higher rates of return to reflect the higher level of risk.

³⁷ IPART (September 2006), *Pricing Arrangements for Recycled Water and Sewer Mining: Sydney Water Corporation, Hunter Water Corporation, Gosford City Council and Wyong Shire Council. Determinations and Report.*

Other jurisdictions, such as in Victoria and New South Wales, have developer charges that are regulated in a way that provides for discounts where recycled water systems are installed in new developments.

The Authority has recently undertaken an inquiry into the Water Corporation's developer charges, and considered the issue of discounts off developer charges for water sensitive urban design (**WSUD**). This report has been tabled in Parliament and is available on the Authority's web site. WSUD covers a wide range of practices, for example, maximising localised retention and re-use of stormwater, re-use of treated effluent, minimising wastewater generation, and collection, treatment and/or re-use of run-off. The Authority concluded that, where WSUD principles result in permanent savings to the Water Corporation in distribution costs for new developments, these savings should be reflected in the developer charges to those new developments.

5 Assessment of Pricing Recommendations of State Water Recycling Strategy

5.1 Terms of Reference

The Terms of Reference require the Authority to:

consider and develop findings on the pricing recommendations of the State Water Recycling Strategy, including the appropriateness of faster adoption of cost-reflective prices for major industry.

5.2 Background

By “faster adoption of cost-reflective prices for major industry”, the Terms of Reference is referring to the current Government policy of transitioning metropolitan commercial water usage charges to charges based on long run marginal cost by 2013/14.

Currently, the metropolitan commercial usage charge has three tiers:

- Usage from 1 to 600 kL is charged at \$0.983 per kilolitre (kL).
- Usage from 601 to 1,100,000 kL is charged at \$1.043 per kL.
- Usage above 1,100,000 kL is charged at \$1.028 per kL.

These three usage charges are to gradually converge to a single usage charge of \$1.714 per kL (in real dollar values of 2009) by 2013/14. In addition to water usage charges, there are also fixed charges which are required to ensure total cost recovery. Any relative increase in the usage charge would be offset by a decrease in the fixed charge for a given levels of costs.

The only pricing recommendation in the State Water Recycling Strategy was:

A review of Water Corporation charges for extending water infrastructure to new urban areas will be undertaken, with consideration given to reflecting the contribution of alternative water supplies.

Government will also investigate the establishment through the Economic Regulation Authority of an industrial tariff to promote the efficient use of water and the use of recycled water by industry.

The first recommendation was addressed by the inquiry into the Water Corporation’s developer charges (see section 4.6).

On the basis of the Terms of Reference and the recommendation of the State Water Recycling Strategy, the issue for this inquiry is whether major industry should be treated in a different way to other metropolitan commercial customers, by either:

- creating a separate tariff for major industry that has a faster transition to long run marginal cost; or

- having a faster transition in the existing tier 2 and tier 3 usage charges (tier 3 does not represent major industry as only two customers currently pay the tier 3 charge); or
- changing the thresholds for metropolitan commercial usage charges to better reflect the split between major industrial customers and other commercial customers, and having a faster transition for industrial customers.

In the event that industrial (or all commercial) customers are transitioned more quickly to water usage charges that are set in relation to long run marginal cost, the competitiveness of recycled water from projects such as the Kwinana Water Reclamation Plant is increased.

Usage charges for commercial customers are also currently under review by the Authority as part of the Inquiry on the Tariffs of the Water Corporation, Aqwest and Busselton Water. Information on this inquiry is available on the Authority's web site.

5.3 Water Corporation Submission

The Water Corporation supports a faster transition for large industrial customers only (those using 20,000 kL per annum or more).

The Corporation supports the faster phase-in of tariffs to LRMC by 1 July 2010 for commercial customers using more than 20,000 kL per annum.

(Water Corporation submission, p3)

The consequence of this phase-in policy is that the incentive for industrial customers to move to viable alternative water sources, such as the expansion of the Kwinana Water Reclamation Plant is delayed.

The Corporation would support a faster phase-in of the volumetric charge for large customers as this would provide an earlier incentive to implement water efficient processes and alternative water sources.

The Corporation recommends that this be achieved by creating a temporary step in the charging structure from 20,000 kL per annum, with customers paying the LRMC for consumption above this amount from 2010/11, and the price for consumption below this amount being gradually increased to LRMC by 2013/14.

The advantage of this approach is that it provides an early incentive to large customers, while maintaining the phase-in approach for smaller customers. It also avoids the need to create a separate industrial tariff, with the associated problems of classifying customers and incorporating changes to the billing system.

Approximately 250 commercial and industrial customers use more than 20,000 kL per annum. It is recognised that these customers have greater scope to invest in water use efficiency, recycling, trading or development of alternative water supplies. Further, water consumption charges are a very small part of their cost structure. These customers are required to submit a Water Efficiency Management Plan by 1 July 2009.

(Water Corporation submission, p16)

5.4 Other Submissions

A key issue is whether large industrial customers should be treated differently to other smaller industrial and commercial customers. The Department of Water supported a faster transition to cost reflective prices more generally:

The Department of Water supports consideration of this issue, but notes that faster phase-in of cost reflective prices more generally may also be worthy of examination in the context of its possible impact on recycled water pricing. (Department of Water submission, p8)

Similarly, the Department of Treasury and Finance did not support distinguishing between major industry and other commercial customers:

Major industry should not be treated differently to other commercial customers, and a full cost pricing system should be applied to all transactions. However, in practice major industry may have more countervailing market power and the capacity to develop water sources themselves. This may not warrant the same regulation and monitoring of water charges as other commercial customers. (Department of Treasury and Finance submission, p6)

However, the Chamber of Commerce and Industry, while also recommending the equal treatment of all water users, supported a transition for all customers by 2014, with no acceleration for industrial or commercial customers.

CCI does not agree to the singling out of heavy industry for accelerated transition, despite the political attractiveness of this. CCI believes that if pricing reform can be accelerated for heavy industry, it can also be hastened for all potentially all water users.

CCI understands that the issues paper into the pricing of recycled water indicates an intention to move to full-cost recovery, using a single tariff based on long run marginal cost by the year 2013/14. CCI supports this and recommends that it should ensure efficient use of the resource and encourage the introduction of additional recycling schemes. CCI recommends that the full environmental cost should be included in the calculation of long run marginal cost, as current potable water prices are too low to encourage increased recycling.

(Chamber of Commerce and Industry WA submission, p3)

5.5 Assessment

There are a number of reasons to support a faster transition to cost-reflective water usage charges (by 2010) for all metropolitan commercial and industrial customers.

- Efficient prices, which signal to buyers and sellers the costs of producing goods and services, maximise welfare by directing resources towards their highest value use. Any delay in the move to cost-reflective usage charges therefore involves a cost, in the sense that welfare is not being maximised.
- The delay in transition towards cost-reflective water usage charges (to 2014) is primarily to address social issues, such as the impact of large price increases on tenants and low income households. However, there are no such social considerations in the case of commercial or industrial customers.
- A faster transition towards cost-reflective usage charges by commercial and industrial customers would encourage the development of recycled water projects that would be economically viable in a regime of cost-reflective commercial and industrial tariffs.

While the Authority supports the faster transition of commercial customers in principle, usage charges to industrial and commercial customers will be considered in detail as part of the inquiry into the tariffs of the Water Corporation, Aqwest and Busselton Water. This will include specific analysis of the Water Corporation's proposal in that inquiry of cost reflective usage charges of up to \$2 per kL.

Draft Recommendation

- 6) All metropolitan commercial customers should be treated equally and transitioned faster to cost-reflective usage charges (by 2010 rather than 2014). (The Authority is considering the issues of usage charges for commercial customers in its inquiry into the tariffs of the Water Corporation, Aqwest and Busselton Water.)

6 Other Factors that are Relevant to the Adoption of Water Recycling and Other Alternative Water Supplies

6.1 Terms of Reference

The Terms of Reference require the Authority to:

consider and develop findings on other factors that the Authority considers relevant to the adoption of recycled water and other alternative water supplies.

6.2 Background

The State Water Recycling Strategy highlighted a wide range of factors that are important to the adoption of water recycling and other alternative supplies.

The factors that the Authority investigating as part of this inquiry include:

- the appropriateness and effectiveness of the current recycling target;
- the role of rebates;
- the appropriateness of reserving water from wastewater treatment plants for specific purposes;
- the appropriateness of standards or regulations that mandate the installation of recycling systems; and
- the regulatory arrangements for third party access to wastewater and stormwater (which was considered in detail as part of the Inquiry into Competition in the Water and Wastewater Services Sector).

6.3 Recycling Targets

The State Water Recycling Strategy includes the target of 30 per cent water recycling by 2030. The target appears to be motivated by the premise that recycled water can be cost effective when compared to traditional water sources and that there needs to be a more intensive 'push' for recycling opportunities.

One of the major initiatives that will contribute to the 30 per cent recycling target is the expansion of the Kwinana Water Reclamation Plant, which will increase the rate of water recycling to 17.3 per cent. The other major initiative is the Gnangara Groundwater Replenishment Trial. By 2030, an additional 50 GL of recycled water will be required to meet the target.

Recycling targets can be an effective means of focussing attention on alternative water source options given the absence of a competitive market in the provision of water services. However, it would generally be inefficient to develop recycling options that have a per kL cost that is higher than traditional sources unless they were able to provide high

degrees of flexibility, avoid investment in options for which utilisation would be uncertain, and/or provide external benefits to third parties.

6.3.1 Submissions

Submissions to the Authority showed general support for the role of recycling targets in the adoption of recycled water in Western Australia, and the level of 30 per cent wastewater recycling by 2030 set by the State Water Plan.

Water Corporation

The Corporation supports...the State Government's target to recycle 30% of wastewater by 2030. The target provides a focus for innovation, supports fit-for-purpose water use, assists in the timely development of supporting regulation and builds technical capacity. (Water Corporation submission, p4)

....

The policy to set the target to recycle 30% of wastewater was developed through an extensive, state wide consultation process during the development of the State Water Plan (not Recycling Strategy as per Issues Paper). The target was endorsed by Government and announced by the Minister for Water Resources in May 2007.

The Corporation notes the extensive community consultation process undertaken to develop the plan and the Government's authority to set water policy objectives. (Water Corporation submission, p18)

Department of Water

Clear and achievable targets are an effective way of focusing effort on performance improvement. The Department of Water believes that the State water recycling strategy target to recycle 30 per cent of wastewater by 2030 is achievable. (Department of Water submission, p10)

Department of Treasury and Finance

Water recycling targets provide a good framework to reach the NWI and the 2007 State Water Plan objective of increasing the use of recycled water. (Department of Treasury and Finance submission, p6)

The Water Corporation submitted that recycling targets have not led to inefficient investment in recycled water.

Water Corporation

The target is aspirational and no penalties are associated with any failure to meet it. It has not resulted in the inefficient investment in recycled water in Western Australia. (Water Corporation submission, p18)

Other submissions focussed on how to ensure that the targets can best be achieved.

Water Corporation

[Re-use] targets should be achieved in the most efficient manner available. Ideally, any short-fall between revenue and costs in meeting reuse targets should be met by an explicit CSO payment. Alternatively, the cost could be met by the Corporation's general customer base as a "cost of doing business". This cost should be explicitly recognised and endorsed by Government so that it is recognised by the ERA in their price recommendations. (Water Corporation submission, p6)

City of Mandurah

State targets need to be broken down into more meaningful and specific targets for regions. (e.g. Peel Region to use 30 per cent recycled water by 2020). Regional targets would be more relevant and will ensure that communities (business and government) work together. Targets need to be continually reviewed to ensure continued take up of recycled water even if state targets are achieved.

The City of Mandurah may look to develop its own targets and implementation plan to achieve these. Recognition via funding and rebates should be provided to companies that develop their own Water Recycling Strategy, acknowledging that each area is location specific with regards to appropriate methods of reuse. (City of Mandurah submission, p6)

Kwinana Industries Council

Positive economic incentives such as water charge rebates should be considered to help achieve the State Government's target of 30% reuse by 2030. (Kwinana Industries Council submission, p2)

Several submissions supported the view that it was important to consider the cost of recycling relative to other water supply options.

Department of Treasury and Finance

[T]he use of recycling targets is only useful if economically efficient recycled water projects are put in place to reach these targets.

The use of recycling targets is supported, but these targets should be flexible. It is imperative that the cost of recycling is competitive to avoid the introduction of recycling projects, which meet recycling targets, but cost more than other means of supplying water. (Department of Treasury and Finance submission, p6)

Water Corporation

It is acknowledged that there some circumstances where the target makes no sense. For example, in the East Kimberley where significant water resources can be developed at a far lower cost with less environment impact. (Water Corporation submission, p18)

The City of Mandurah note that there is insufficient funding for meeting targets, and that approvals processes make it difficult to implement recycled water projects:

[I]n practical terms we believe there is a lack of 'on ground' support to implement recycling schemes highlighted in the following areas:

Lack of Funding for initiatives

The City recommends the State Government commits a high level of funding to support Local Government, business and industry to contribute to achieving the targets set by the State Water Plan 2007, in particular the State Water Recycling Strategy. We also urge the Federal government to recommit funds to the Australian Community Water Grants program.

Barriers to Approval Processes

City officers have found that the approval processes and number of government departments involved in the approvals to use recycled waste water is prohibitive with regards to time, process, approval requirements, strategic alignment and inter / intradepartmental inconsistencies.

Very little assistance is provided to guide [Local Government Authorities] to assist with or expedite processes.

(City of Mandurah submission, p3-4)

6.3.2 Assessment

Setting targets for recycling involves some risk that such policies may artificially encourage projects that are not the most efficient options to balance supply and demand (and, conversely, discourage some that are). However, recycling targets can encourage water service providers to actively seek cost effective recycling options. This can be especially important in the absence of a competitive market in the provision of recycled water.

Targets need to be complemented by policy settings that support the most cost effective water supply options, including recycling options. This would require:

- the efficient pricing of water and wastewater services, so that recycling and other options can compete on a level playing field;
- a competitive environment in the provision of bulk water supplies, to encourage innovation and participation by third parties. (This has been dealt with extensively in the inquiry into competition in the water and wastewater sector.); and
- potentially, third party access to infrastructure, to facilitate the recycling of wastewater by third parties where they can do so more cost-effectively than the infrastructure owner.

Draft Finding

- 7) In the absence of a competitive market in the provision of recycled water projects, recycling targets can provide an incentive for service providers to seek out and invest in cost effective recycling options.

6.4 Rebates

The Authority is intending to consider the appropriateness of rebates as an instrument to encourage the cost effective adoption of recycling and other sources.

The rebate that is currently available for water recycling is the rebate for greywater reuse systems. This rebate provides up to \$500 or 50 per cent of the purchase/installation cost (whichever is the lesser amount) for an approved system.

In addition, rebates are available for other alternative water supplies, such as:

- Domestic rainwater tanks – tanks with a capacity greater than 600 litres that are not plumbed in are eligible for a rebate of \$50. Tanks with a capacity greater than 2,000 litres are eligible for a rebate of up to \$600 or 50 per cent of the purchase and plumbing in cost (whichever is the lesser amount), if they are plumbed in by a licensed plumber for use in a toilet and/or washing machine when installed.
- Garden bores – for sites that are eligible, a rebate of \$300, or 50 per cent of the installation cost for a new bore (whichever is the lesser amount), is available per residential property.

Rebates are also available for other demand management measures, such as for washing machines, irrigation systems, rain sensors, swimming pool covers and flow regulators.

The effectiveness of rebates depends on the cost per kL of the cost of the water source (inclusive of the rebate) in comparison to the cost of scheme water.

6.4.1 Submissions

The Water Corporation noted that the examination in this inquiry of rebates not related to the recycling of water may be outside the scope of the terms of reference:

None of the rebates in question relate to recycled water (as they do not involve the further treatment of water). They are perhaps out of the scope of this inquiry. (Water Corporation submission, p18)

However, the terms of reference require the Authority to also consider other factors relevant to “alternative water supplies”, so the issue of rebates is relevant in this context.

The Water Corporation is strongly supportive of the rebates program, which it maintains has cost effectively helped to achieve considerable reductions in scheme water use:

The rebate program was established by the State Government in 2003 further to the State Water Symposium and Strategy. Rebates have assisted in reduced reliance on scheme water by the community who have adjusted to reduced watering regimes.

There has been a reduction in residential consumption of about 20% since 2001 in Perth, without the need for severe water restrictions. Overall savings of 50 GL pa have been achieved that represents the avoided cost of more new sources such as desalination plants. The Corporation has undertaken costing on all of the rebates that show the cost to be less than \$1 a kilolitre for all rebates. Demand management represents a very low cost demand / supply alternative. (Water Corporation submission, p18)

....

The Corporation supports...the use of rebates as part of broader water policy that positively influences changes in behaviour and ultimately encourages more efficient water use. (Water Corporation submission, p4)

The Department of Treasury and Finance submitted that the cost effectiveness of rebates, on a per kL basis, should be examined by the Authority.

The use of rebates to compensate consumers for the higher cost of recycled water is not encouraged as this discourages the recycled water industry from lowering costs. The ERA is encouraged to assess the economic efficiency and cost effectiveness of a rebate scheme to promote the use of recycled water. Any such investigation to manage demand in this way must include the calculation of cost per kilolitre of water and the avoided cost of water saving technology potentially delaying future water sources. A rebate scheme should only be proposed if the cost per kilolitre of recycled water is comparable with the benchmark LRMC. (Department of Treasury and Finance submission, p7)

The Department of Water also supported an investigation of the cost-effectiveness of rebates, but noted that there may be additional benefits from recycling (reflected in a higher willingness to pay by some consumers, or avoided infrastructure costs) that may not be fully reflected in the cost.

The Department of Water supports the use of rebates for household products that promote water use efficiency and recycling, such as those provided through the Waterwise Rebates program. Rebates may potentially address market failures related to:

- a lack of price signals for wastewater discharge and drainage
- weak price signals for water pricing, including during extended phase-in periods for price increases

- environmental externalities.

The Department of Water supports investigation of the cost-effectiveness of rebates.

The uptake of rebates is voluntary, and some consumers may be willing to pay a premium for alternative water sources or water efficiency measures that have a higher unit cost than scheme water. Thus while the paper suggests that cost-effectiveness be assessed by comparing the unit cost of the alternative water source with scheme water, it may be more appropriate to compare the cost of a rebate itself with all benefits that accrue to the party funding the rebate.

The benefits that accrue to water service providers from rebates may include reduced costs in water and wastewater service provision. Rainwater tanks may also reduce costs of drainage. There may also be public benefits associated with rebates through improved environmental outcomes.

(Department of Water submission, p10-11)

The City of Mandurah and the Chamber of Commerce and Industry WA both submitted that a priority is the introduction of pricing structures that fully reflect costs, with rebates following from this.

City of Mandurah

The first priority should be to introduce sustainable pricing that reflects identified outcomes and benefits.

The pricing structures (and the statutory process for permits) need to ensure the use of recycled water is a realistic option. To this end rebates should be secondary and...an option to businesses for contributing to a community benefit. (City of Mandurah submission, p6-7)

Chamber of Commerce and Industry WA

CCI believes that rebates could be used to overcome public perception issues surrounding the use of recycled water and to encourage greater recycling activity. This however should only take place after pricing reform. (Chamber of Commerce and Industry WA submission, p3)

6.4.2 Assessment

The Authority has not had time at this point in the inquiry to examine the cost effectiveness of the various types of rebates. The Authority intends to conduct this analysis for the final report, and to examine the cost estimates carried out by the Water Corporation.

Any examination of the cost-effectiveness of rebates should take into account all of the costs associated with water saving technologies; i.e. the total cost per kilolitre of water saved (including the rebate plus the additional cost to the customer of installing the new technology).

Draft Finding

- 8) The cost effectiveness of rebates will depend on the cost per kilolitre saved, where the cost is the cost of the rebate plus the additional installation costs to the customer. The Authority will be investigating this further.

6.5 Mandatory Standards

The State Water Recycling Strategy states:

- The revision of building codes through 5 Star Plus will support the inclusion of complimentary water supplies to meet demand for external garden use, toilet flushing and clothes washing.
- In the future, new heavy and general industrial areas will be required to investigate the installation of a third pipe to distribute recycled water. Where feasible and cost effective, existing heavy industrial areas should be retrofitted to facilitate the use of recycled water.

Under the 5 Star Plus program, implemented on 1 September 2007, new houses are required to meet minimum standards for energy and water efficiency. Under this program, the *Water Use in Houses Code* specifies that all new houses must have 3 or 4 Star rated water efficient fittings and fixtures, hot water outlets located near the hot water system, and covers on swimming pools.

It is understood that a second stage of the 5 Star Plus program is under development which may prescribe additional standards.

Existing homeowners are not required to comply with the 5 Star Plus standards.

There has been no formal implementation into building or land development codes of mandatory standards for heavy and general industry.

6.5.1 Submissions

Submissions were generally supportive of the use of mandatory standards in the adoption of recycled water.

Department of Water

Mandatory standards such as the water efficiency measures referred to in the issues paper are intended to ensure that cost-effective water-sensitive urban design measures are installed in buildings and developments at the time of construction, when the cost of installation is minimised.

The issues paper (page 28) states that “the risk... is that the water savings may not be cost effective in comparison with other source options.”

In considering the benefit of water sensitive urban design measures, any relevant savings in avoided wastewater augmentation or drainage costs should also be considered as well as any improved environmental outcomes. (Department of Water submission, p11)

Water Corporation

The Corporation supports...the appropriate use of mandatory building standards, including standards that promote water efficiency and consumer choice. (Water Corporation submission, p4)

....

Mandatory standards, such as Building Codes, play an important role in ensuring appropriate standards that reflect the needs of the community. These standards may pertain to public safety, public health, durability, liveability and sustainability. Cost effectiveness is one consideration in the setting of building codes.

There is a long history of association with water standards in building codes including plumbing standards and water efficiency. The mandating of dual flush toilets is one example.

The changes to the Building Codes announced by Government that ensure homes are “alternative water source ready” reflect community support for increased access to alternative water sources. While the additional cost of the standard is minimal, the cost of retrofitting for these changes is prohibitive. Mandating standards for homes protects consumers from inappropriate and poor design and construction, excessive future costs and promotes future flexibility and choice. (Water Corporation submission, p20)

City of Mandurah

Mandatory standards would play an important role in regard to:

- Security / guarantee of supply
- Certainty of access to recycled water and sustainability of water
- Secondary sales market – potential on-sale / passing off needs to be regulated / controlled.

(City of Mandurah submission, p7)

The Chamber of Commerce and Industry also supported mandatory standards for new buildings, but submitted that these should not be applied retrospectively.

Chamber of Commerce and Industry WA

CCI believes that mandatory standards should be applied to all new domestic and commercial building construction, requiring the installation of infrastructure for grey water reuse, rainwater collection and other water use efficiency devices. The additional costs could be offset by increases in property values for ‘green’ buildings. Standards should also be applied when there are planned building refurbishments, but should not be applied retrospectively to unimproved buildings. (Chamber of Commerce and Industry WA submission, p3)

The Department of Treasury and Finance noted the importance of determining the cost effectiveness of mandatory standards.

It is noted that the setting of mandatory standards such as the 5 Star Plus scheme introduced by Government, can be a useful approach to reach recycled water targets. It should be noted however, that there is concern about the introduction of further regulatory burden on both the housing industry and existing homeowners for schemes such as this.

The benefits of setting mandatory standards must be weighed against the costs. Retrofitting of existing properties may bring benefits of reduced consumption of scheme water, potentially delaying future water sources. However, there is a risk that the cost of imposing such water saving measures exceeds the long run marginal cost of new water supplies.

The ERA is encouraged to look closely at the costs and benefits of the setting of these standards. In particular, a full assessment should include an analysis of the cost of

mandatory standards, including the cost of compliance and any negative impact on customers. If regulation were to be introduced to enforce mandatory recycled water use, there would be merit in also conducting a Regulatory Impact Statement (RIS). An RIS monitors and assesses the costs and benefits of a proposal to determine the burden a particular regulation has on the State and increases transparency in Government decisions.

(Department of Treasury and Finance submission, p7-8)

6.5.2 Assessment

The key issue regarding mandatory standards is whether the cost per kilolitre of water saved is more or less than other water sources.

Mandatory standards are likely to be more cost effective for new houses, where implementation costs can be minimised in the design process of new homes and developments, than for retrofitting of existing properties. However, the 5 Star Plus program only applies to new homes and is not mandatory for existing homes. The current standards relate to tap fittings (other than bath outlets and gardening taps), showerheads, and sanitary flushing systems. These standards complement the current rebate system. In many cases (e.g. shower heads, taps or toilets) there would be little or no incremental cost to the consumer between buying a water efficient technology as opposed to a high water use technology. The Authority will examine these issues in more detail in this inquiry.

While the cost effectiveness of mandatory standards is an efficiency issue, the question of who bears the cost of mandatory standards is an equity issue. The costs of mandatory standards for new homes would be incurred mainly by the purchasers of the homes. To the extent that there are savings in development costs arising from the reduced water demand by new developments, due to the mandatory standards, these should be reflected in lower developer charges. New home owners would also benefit from lower water bills.

Draft Recommendation

- 9) As with rebates, the cost effectiveness of mandatory standards will depend on the cost per kilolitre of water saved. The Authority will be investigating this further.

6.6 Reservation of Water From Wastewater Treatment Plants

The State Water Recycling Strategy states:

- Due to increasing pressure on our groundwater resources, the State Government is currently investigating the viability of horticultural precincts. Water from the new Alkimos Wastewater Treatment Plant has some potential for future use in horticulture, and may be reserved for this purpose.
- In recognition of the potential for water to be recycled for drinking purposes, water from the Beenyup Wastewater Treatment Plant will be reserved for this purpose. This will ensure that there is a source available should groundwater replenishment become an acceptable drinking water supply option in the future.

The Authority is considering the appropriateness of using reservation policies for resources that may have significant alternative uses.

6.6.1 Submissions

The Water Corporation is supportive of policies to reserve wastewater for specified purposes.

Water Corporation

The Corporation supports...the reservation of recycled water for public water supply and other high value uses. (Water Corporation submission, p4)

.....

The State Water Plan, developed through an extensive process of community consultation was released by the Minister for Water Resources in May 2007.

Objective 5 “Enhance the security of water for the environment and use” recognises that environmental water provisions have security to ensure sustainable ecosystems.

The next principle states that “Water may be reserved for future public water supply and other high value uses”.

These principles reflect water policy nationally, and more broadly, internationally. The provision of water to safeguard ecosystems and provide essential water to communities is a high priority for Governments’ and communities around the world and in Australia.

(Water Corporation submission, p20)

The City of Mandurah also supported the reservation of some quantities of recycled water for community purposes.

A portion of available recycled water should be reserved for community public benefit (e.g. 5 GL allowance out of a 12 GL capacity WWTP. The State should undertake forward planning taking population growth for specific areas into account. This would also link into regional Water Recycling Strategies. (City of Mandurah submission, p7)

The Department of Water wants to ensure that water from the Beenyup WWTP is available for groundwater replenishment.

The State water recycling strategy notes that water from the Beenyup Wastewater Treatment Plant will be reserved for potential groundwater replenishment for future drinking water.

Groundwater replenishment is a potentially large and valuable future use. Reservation is intended to ensure that the potential for groundwater replenishment is not lost during the period of the trial. This could happen if water were gradually sold off to other uses in a way that could stop the water being used for a future groundwater replenishment project if its value is demonstrated.

Reservation does not necessarily preclude the Water Corporation using or selling recycled water temporarily, or from other more valuable recycling innovations being considered if these were identified.

(Department of Water submission, p11)

However, the Department of Treasury and Finance did not support wastewater reservation policies, favouring instead an allocation mechanism that ensures that wastewater resources are directed to their highest value use.

Water allocation management plans where water from wastewater treatment plants is reserved for a particular use are not supported. A reservation policy does not ensure that

water is allocated to its highest value use, which is necessary for the efficient allocation of water supplies.

The ERA's suggestion of auctioning water instead of a reservation policy is supported. This will provide a mechanism whereby water suppliers are able to compete for water supplies based on the value they attribute to their use. It promotes competitiveness and market efficiency. It will also assist the Water Corporation in the planning of its operations and resourcing.

(Department of Treasury and Finance submission, p7)

6.6.2 Assessment

Policies that reserve water for a specific purpose involve second-guessing that the use of the water for that purpose has a higher value than alternative uses. It would generally be appropriate to use a neutral auctioning process rather than a reservation policy to ensure that, where water from a wastewater treatment plant has significant value, that water is allocated on a commercial basis to customers who value it most.

In its final report on the Inquiry into Competition in the Water and Wastewater Services Sector, the Authority expressed concern regarding the reservation of water supplies for public suppliers, and recommended that an effective trading regime for water allocations would be a better mechanism for ensuring that water supplies are directed to their highest value use. The same conclusions would apply in the case of any reservation of treated wastewater supplies from wastewater treatment plants.

It should be noted that the State Water Recycling Strategy does not prescribe the reservation of water from the Alkimos plant for horticultural use, but simply raises this possibility subject to a viability assessment. However, reservation of water from the Beenyup plant for the purpose of groundwater replenishment assumes that this is the highest value use for the treated wastewater.

However, a neutral auctioning process would not only identify the value of the water for horticulture and groundwater recharge, but would also identify any other potentially higher uses. In terms of auctioning water from the Alkimos and Beenyup plants, the value placed on the water by horticulturalists and the Water Corporation itself (in the case of future public drinking supplies made available through aquifer recharge) may be more or less than the value placed on the water by other potential users, such as a private service provider wanting to supply commercial users, third pipe schemes to new residential developments or other innovative applications. This is not just an issue for the treated wastewater from the Alkimos and Beenyup plants, but for all situations where wastewater is a scarce resource.

Draft Finding

- 10) The reservation of water supplies for specific purposes involves second-guessing the value of water to users. Whenever wastewater is a scarce resource, it should be allocated using a neutral auctioning process.

6.7 Third Party Access

Third party access regimes allow entities other than an infrastructure owner to use infrastructure to deliver services to customers. Third party access regimes:

- set out the terms and conditions of use; and
- outline prices (or how prices are to be determined) that may be charged by the infrastructure owner for access.

An effective access regime would allow businesses to access wastewater or stormwater from the service provider and recycle it for either their own purpose or for sale to customers.

Third party access regimes are common in the gas, electricity and telecommunications industries. However, they are less common in the water and wastewater industry.

There are no current institutional or legislative restrictions on seeking third party access to water and wastewater networks in Western Australia. Under current arrangements the process is as follows:

- A potential entrant seeking access to infrastructure of national significance can approach the infrastructure owner and attempt to negotiate access.
- If this fails, they can apply to the National Competition Council (**NCC**) to have the infrastructure declared under Part IIIA of the *Trade Practices Act 1974*.
- Should the approach to the NCC be unsuccessful or the findings of the NCC be rejected by the relevant Minister, who has the discretion to set aside the NCC findings, the access seeker can apply to the Australian Competition Tribunal for review of the decision not to grant access to the infrastructure.

However, this may be a long and expensive process. As an alternative to the national access regime under the Trade Practices Act 1974, the Competition Principles Agreement also provides for State-based regimes for third party access to infrastructure.

As part of the Inquiry on Competition in the Water and Wastewater Services Sector, the Authority recommended that a simple State-based third party access regime be developed. The Final Report for this inquiry has been tabled in Parliament and is available on the Authority's web site. The Authority also noted in that inquiry that the third party access regime being introduced in New South Wales could provide a model upon which to base a Western Australian regime. The NSW Government has introduced the *Water Industry Competition Act 2006*, which makes it possible for third parties to enter into the market to supply water, sewerage and recycled water services.

It is uncertain to what extent private sector participants may seek to provide such services, because it is not possible to predict the range of ideas that the private sector may generate. The underlying principle of third party access regimes is to remove the barriers to entry, and allow the market to come up with proposals. Early indications in NSW is that several proponents are already actively considering a number of schemes for recycling wastewater.

Respondents to the Issues Paper were highly supportive of the introduction of a State-based third party access regime in Western Australia, on the grounds that this would allow for innovation by the private sector in the provision of alternative recycling initiatives (see submissions by the Chamber of Commerce and Industry WA, Department of Water,

Department of Treasury and Industry, Water Corporation). The City of Mandurah noted the existing bureaucratic difficulties of implementing recycled water schemes and supported a simplified model to encourage third party participation, subject to public consultation.

As indicated in the Issues Paper, the Authority does not intend to revisit this issue in detail as part of this inquiry, unless particular issues are raised which warrant the Authority refining its advice to the Government.

Draft Recommendation

- 11) A State-based third party access regime should be introduced. This would allow third parties access to the wastewater network for the purpose of providing recycled water.

Appendix 1 Terms of Reference

INQUIRY INTO PRICING OF RECYCLED WATER IN WESTERN AUSTRALIA

TERMS OF REFERENCE

I, ERIC RIPPER, Treasurer, pursuant to Section 32(1) of the *Economic Regulation Authority Act 2003* request that the Economic Regulation Authority (the Authority) undertake an inquiry into, and make recommendations on pricing and other relevant factors affecting the adoption of recycled water and other alternative water supplies.

In doing so, the Authority is expected to consider and develop findings on:

- the circumstances in which recycled water prices should be regulated, and the recommended approach to any required regulation;
- the pricing recommendations of the State Water Recycling Strategy, including the appropriateness of faster adoption of cost-reflective prices for major industry;
- other factors that the Authority considers relevant to the adoption of recycled water and other alternative water supplies.

In developing its recommendations the Authority will have regard to:

- the Government's social, economic and environmental policy objectives;
- distributional issues, such as those between customers of recycled water services and other services in the same scheme; and
- any relevant pricing principles arising from the 1994 Council of Australian Governments water reform agreement and the National Water Initiative.

The Authority will release an issues paper as soon as possible after receiving the reference. The paper is to facilitate public consultation on the basis of invitations for written submissions from industry, government and all other stakeholder groups, including the general community.

A draft report is to be available for further public consultation on the basis of invitations for written submissions.

The Authority will complete a final report no later than seven months after receiving the Terms of Reference.

**ERIC RIPPER MLA
DEPUTY PREMIER; TREASURER;
MINISTER FOR STATE DEVELOPMENT**

Appendix 2 Glossary

Term	Definition
ACCC	Australian Competition and Consumer Council
Act	<i>Economic Regulation Authority Act 2003</i>
Authority	Economic Regulation Authority
COAG	Council of Australian Governments
Corporation	Water Corporation
CSO	Community Service Obligation
ESC	Essential Services Commission (Victoria)
GL	Gigalitre (one billion litres)
IPART	Independent Pricing and Review Tribunal
kL	kilolitre (one thousand litres)
KWRP	Kwinana Water Reclamation Plant
MAR	Managed Aquifer Recharge
ML	Megalitre (one million litres)
NCC	National Competition Council
NWI	National Water Initiative
SDOOL	Sepia Depression Ocean Outfall Line
UWA	University of Western Australia
WSAA	Water Services Association of Australia
WSUD	Water Sensitive Urban Design
WWTP	Wastewater Treatment Plant