



NCEconomics

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Minor and Intermediate Retailers  
Pricing guidelines for reuse schemes  
Draft Report

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## KEY POINTS

*ESCOSA currently adopts a light-handed approach to price regulation for M&I retailers.*

The Essential Services Commission of South Australia's (ESCOSA's) Price Determination for Minor and Intermediate (M&I) Retailers adopts a light-handed approach to pricing for recycled wastewater and stormwater. The Price Determination requires transparency in pricing and the application of the NWI Pricing Principles. ESCOSA will monitor prices and has the authority to apply a more prescriptive regime in the future if required.

While the original Price Determination has been extended with no fixed end date, ESCOSA has raised concerns about the long-term sustainability of small networks and has reiterated the importance of maintaining capital investment levels and smoothing pricing impacts over time.

*The NWI Pricing Principles stipulate a lower and upper limit for pricing.*

The NWI Pricing Principles state that prices should recover the full direct, efficient costs of the service and must lie between a lower limit of the incremental costs of providing the service, and an upper limit, which is the lesser of standalone costs or customers' willingness to pay for the service. There is significant scope for applying different pricing methodologies within this range.

As a minimum, the lower limit should recover the annualised cash costs associated with ongoing operating and maintenance (including administration) and future capital expenditure. In many cases, the upper limit will be customers' willingness to pay, which is often assumed to be slightly below SA Water's drinking water price.

*Prices could be 'future-proofed' by adopting the building block approach.*

Councils wishing to 'future-proof' their prices might consider applying the standard building block approach, which has been adopted by most Australian economic regulators when a more prescriptive approach has been required, and generally falls between the NWI lower and upper limit.

Under the building block approach, the total revenue target is equal to operating and maintenance costs (including administrative costs) plus regulatory depreciation and a return on the Regulatory Asset Base (RAB). Regulatory depreciation and the RAB are generally less than their statutory accounting counterparts because they are net of government grants and upfront customer contributions. The asset values may also be written down using a 'line in the sand' methodology to recognise that historic capital investments had lower rate of return expectations.

If the retailer's forward looking incremental costs (the NWI lower limit) are higher than the building block costs, the retailer might consider an annuity approach, which recovers the renewal of future capital expenditure through a smoothed annual allowance. The renewals approach should extend for the life of the scheme unless there is good reason to do otherwise. The renewals annuity approach is also consistent with the NWI Pricing Principles but requires more judgement than the building block approach because the assets involved have not yet been constructed.

# 1. INTRODUCTION

## 1.1. Background

The *Water Industry Act 2012* (the Act) establishes a state-wide framework for the regulation of the water sector. The Act provides for the protection of the interests of South Australian water and sewerage consumers through efficient pricing practices, consumer protection and technical regulation. Under the Act, retail water service providers must be licensed by the economic regulator, the Essential Services Commission of South Australia (ESCOSA, or “the Commission”).

ESCOSA classifies local governments operating Community Wastewater Management Schemes (CWMS) or alternative water supply schemes as Minor or Intermediate (M&I) retailers under the Act. There are currently 56 local government bodies listed on the ESCOSA website as licensed M&I retailers.

To date, ESCOSA has taken a light-handed approach to the regulation of M&I retailers, requiring greater price transparency and the application of key National Water Initiative (NWI) Pricing Principles.

## 1.2. Scope of this project

This report provides guidelines and pragmatic advice for local government on the application of ESCOSA’s Price Determination and more specifically the NWI Pricing Principles. Of particular concern is the NWI requirement to recover the costs of capital investment.

This report considers the options available under the NWI and the areas in which discretion is available to accommodate different initial pricing levels.

As an adjunct to this report, we will also provide a separate spreadsheet model, which will – at a high level – allow councils to calculate the NWI lower and upper limits, and the prices associated with a more prescriptive regulatory approach. Should any constraints to implementing the NWI principles be identified, we will also provide a secondary report outlining options for addressing those constraints. If ongoing subsidies would be required, we will consider how such subsidies might be justified to an economic regulator.

As this report is being prepared for the Managed Aquifer Recharge (MAR) user group, we have focussed on pricing for stormwater recycling schemes that are owned and operated by local government, although most of the principles extend equally to wastewater recycling schemes. While the NWI Pricing Principles explicitly state that they do not apply to sewerage services, ESCOSA has decided to treat sewerage services, including Community Wastewater Management Systems (CWMS), in a manner similar to drinking water services. For this reason, the principles that relate to capital recovery will also apply to CWMS services, although the principles relating specifically to recycled water differ from those relating to drinking water.

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## 2. REGULATORY REQUIREMENTS

### 2.1. ESCOSA determinations

Under the *Water Industry Act 2012*, retail water service providers must be licensed by ESCOSA, who regulate the pricing of those services through regulatory determinations. In June 2013, ESCOSA made its first price determination for M&I retailers, to apply to licensees for the period 1 July 2013 up to and including 30 June 2017 (hereafter, “the Price Determination”).<sup>1</sup> The Price Determination was subsequently varied to continue to apply indefinitely until such time as a new price determination is made or there are otherwise “cogent reasons” for ESCOSA to revoke it.<sup>2</sup>

The key requirement of the Price Determination is that licensees must comply with the NWI Pricing Principles when charging for water services and to report to ESCOSA on how this requirement is complied with. Under this form of regulation, licensees retain the responsibility for determining their own prices.

The intention of the Price Determination was to provide a clear understanding of the pricing issues applicable to M&I water services, while recognising that the transition to full cost recovery would be challenging for some licensees. The pricing principles for recycled water and stormwater were intended to accommodate initially disparate pricing paths. ESCOSA also recognised that the *“consistent application of all the NWI principles may require trade-offs, as some of the principles appear to ‘compete’ or ‘over-ride’ each other. For example, applying a commercial rate of return for recycled water assets may discourage the use of recycled water, which is often considered to have an important role as part of an Integrated Water Resource Planning system (and should therefore be priced accordingly).”*<sup>3</sup>

In monitoring the application of the NWI principles, ESCOSA noted that it would be guided by:<sup>4</sup>

- achievement of the various factors specified in section 6 of the ESC Act, in particular the need to ensure that the long-term interests of consumers with respect to price, reliability and quality of supply are served;
- the intent of the NWI, in particular, paragraph 64 of the agreement that deals with pricing reform commitments;
- consistency with other regulatory regimes, in South Australia and other jurisdictions.

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<sup>1</sup> ESCOSA (2013) *Economic regulation of Minor and Intermediate Retailers of water and sewerage services: Final decision*

<sup>2</sup> ESCOSA (2018) *Subsequent Determination to vary the 2013-2017 Price Determination for Minor and Intermediate Retailers*, clause 2.1.7.

<sup>3</sup> ESCOSA (2013), *ibid*, pp. 38-39

<sup>4</sup> ESCOSA (2013), *ibid*, p. 39

## 2.2. National Water Initiative

The *Intergovernmental Agreement on a National Water Initiative* (the NWI) specifies that States and Territories: *“agree to develop 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”*.<sup>5</sup>

The outcomes identified in the NWI are water pricing and institutional arrangements which:<sup>6</sup>

- 1) promote economically efficient and sustainable use of:
  - a) water resources;
  - b) water infrastructure assets; and
  - c) government resources devoted to the management of water;
- 2) ensure sufficient revenue streams to allow efficient delivery of the required services;
- 3) facilitate the efficient functioning of water markets, including inter-jurisdictional water markets, and in both rural and urban settings;
- 4) give effect to the principles of user-pays and achieve pricing transparency in respect of water storage and delivery in irrigation systems and cost recovery for water planning and management;
- 5) avoid perverse or unintended pricing outcomes; and vi) provide appropriate mechanisms for the release of unallocated water.

## 2.3. NWI Pricing Principles

The NWI Pricing Principles were subsequently developed to assist States and Territories in meeting their commitments under the NWI. ESCOSA’s Price Determination in relation to recycled water and stormwater services concludes that M&I retailers must apply the nine NWI Pricing Principles that relate specifically to recycled water and stormwater.

Unlike the sections of the Price Determination relating to drinking water and sewerage services, the sections relating to recycled water and stormwater do not mention the more general NWI Pricing Principles relating to the recovery of capital expenditure. However, it would be safe to assume that ESCOSA would prefer councils to move toward those principles where possible. We discuss the more formal approach preferred by Australian economic regulators in Section 4.

The principles for recycled water were intentionally designed to be flexible in some areas due to the *“heterogeneous and evolving nature of recycled water and stormwater reuse products and the widely different scenarios under which these schemes are implemented.”*<sup>7</sup>

There are nine NWI Pricing Principles related to recycled water and stormwater, which are reproduced in Appendix 1, together with additional commentary from ESCOSA’s Price Determination (where applicable).

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<sup>5</sup> Intergovernmental agreement on a national water initiative, paragraph 66 (ii).

<sup>6</sup> Intergovernmental agreement on a national water initiative, paragraph 64

<sup>7</sup> NWI Pricing Principles, p.16.

## 3. APPLYING THE NWI PRICING PRINCIPLES

### 3.1. Recycled water price range

Of the nine NWI Pricing Principles (Appendix 1), Principle 7 provides the most comprehensive guidance in relation to how recycled wastewater and stormwater prices should be calculated.

Principle 7 states that **prices should recover efficient, full direct costs**, and that prices should fall within a range:

- the **lower limit** is formed by system-wide incremental costs, adjusted for avoided costs and externalities; and
- the **upper limit** is the lesser of:
  - o stand-alone costs; and
  - o customer's willingness to pay.

The principle also notes that subsidies should be reviewed periodically and, where appropriate, reduced over time.

The Price Determination does not prescribe the manner in which retailers must apply this principle but does provide some guidance, which we elaborate below. The Price Determination provides a recycled wastewater example, but relatively little information in relation to stormwater recycling. Nevertheless, a substantial body of work and regulatory precedents have been established since the NWI principles were developed, and we draw on these in our discussions below.<sup>8</sup>

While Principle 7 states that prices should recover the full costs of providing the recycled water service, it does not prescribe how a retailer might calculate the full cost. While a more prescriptive approach is developed in the NWI cost recovery principles, the Price Determination does not reference these principles in relation to recycled water prices. However, the Price Determination is clear that the prices should fall between the NWI's lower and upper limit.

ESCOSA notes that should any cost recovery gap be identified, the shortfall should be recovered with reference to all beneficiaries of the avoided costs and externalities (see Section 3.2). Subsidies and CSO payments should be reviewed periodically and, where appropriate, reduced over time.

We examine both the lower and upper limit in more detail in the sections that follow.

Importantly, neither the lower limit nor the upper limit mention historic capital costs incurred by the retailer. By contrast, economic regulation of major water retailers around Australia provides clear and detailed methods of incorporating historically incurred capital expenditure into prices. Where a more formal approach to price regulation is required, ESCOSA has adopted the 'building block' approach for economic regulation. Australian regulators typically favoured the building block approach because

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<sup>8</sup> Relevant examples include the Australian Water Recycling Centre of Excellence (2013) *Economic Viability of Recycled Water Schemes*; the National Water Commission (2010) *Pricing principles for recycled water and stormwater reuse*; and various regulatory determinations, particularly in Victoria and NSW.

it is consistent with the approach applied to other water services, is relatively straightforward to apply, and allows the costs to be easily articulated to third parties.

The building block approach has been applied in regulatory determinations for SA Water and recently for a draft determination for a smaller provider.<sup>9</sup> The approach is well-accepted and widely applied in the water industry. The building block approach generally (but not always) falls within the NWI upper and lower limits. While the current regulation allows for a pricing range, it is possible that ESCOSA may adopt a more prescriptive approach in the future and, in our view, would likely favour the building block approach. We examine the building block approach in more detail in Section 4.1.

## 3.2. Lower Limit

### Incremental costs

The lower limit is formed by system-wide incremental costs, adjusted for avoided costs and externalities.

While neither the NWI nor ESCOSA explicitly define the term “incremental costs”, regulators in other jurisdictions have provided clarifications. The NSW economic regulator, IPART, define incremental costs as: “*the costs a public water utility would avoid if it did not proceed with a recycled water scheme,*” noting that such costs include incremental direct costs, facilitation costs (to integrate the scheme into a broader network), reticulation costs and indirect costs.<sup>10</sup>

Incremental costs are the *additional* costs incurred from servicing recycled water customers. As a minimum, the incremental costs should include all ongoing operating and maintenance costs (including administration), capital expenditure and tax expenses associated with the continued operation of the scheme.

By setting the lower pricing limit at the level of incremental costs, this principle ensures the ongoing financial viability of the scheme. It also implies that the scheme will not financially disadvantage any ratepayers who do not utilise the scheme. That is, provided recycled water customers meet the incremental costs incurred by the scheme, there should be no need to raise revenue from other sources to recover those costs. In fact, if the water recycling revenue is greater than the lower limit, the water recycling scheme will be making a positive contribution to the retailer’s financial position, which may in turn reduce the revenue the retailer must raise from ratepayers.

The minimum incremental costs need not include historical investments, but must include all *forward looking* costs to ensure that the scheme will be financially sustainable into the future. When calculating the minimum incremental costs, the retailer should have regard to the cash outflows that will be required to operate, maintain and renew the scheme over its life. With regard to capital costs, the retailer should include the full ongoing cash flows associated with renewals and replacement assets (with the proviso that ESCOSA only allows *efficient* costs to be passed on to customers), but

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<sup>9</sup> ESCOSA (2020) *Robusto Investments Pty Ltd: Drinking Water Draft Regulatory Determination*

<sup>10</sup> IPART (2019) *Review of pricing arrangements for recycled water and related services*, pp. 26-27

should exclude non-cash costs such as depreciation. The costs should be annualised to smooth prices over time.

In its recent draft determination for Robusto, ESCOSA has also made it clear that to be efficient, the timeframe for smoothing prices should reflect the long-term nature of the investment and thereby support intergenerational equity among customers of the scheme (see more on timeframes below).<sup>11</sup>

Incremental costs also include taxes (or tax equivalents), but as local government do not pay income tax, tax adjustments will not generally be required.

### Efficient financing costs

Determining the financing cost associated with local government investments is not straightforward because many local governments prefer to avoid debt, but also have a very low return expectation compared with private investors. Furthermore, local governments may also not specifically ringfence financing for particular projects, but may instead draw from general reserves and/or debt.

For pricing purposes, economic regulators prefer to avoid actual financing costs and instead apply what is known as the Weighted Average Cost of Capital (WACC), which represents an efficient industry standard. ESCOSA has recently determined a WACC for SA Water and another for a small drinking water provider (Robusto). The WACC for SA Water may serve as a general guide, but there may be valid reasons that smaller providers, including councils, may have a different WACC.

In its most recent determination for SA Water,<sup>12</sup> ESCOSA recommended a post-tax WACC that decreased each year for the next four years. After converting to a real pre-tax WACC (because local governments do not incur income tax), SA Water's approved WACC for 2021 translates to around 3.3%.<sup>13</sup> When applying a real WACC (rather than a nominal WACC), it is important that all asset are valued at their current cost rather than historic cost (NWI Pricing Principles, page 6, note iv).

The Robusto draft determination also added a "small size premium", resulting in a real pre-tax WACC of around 6.3% (converted from the post-tax WACC of 5.5% reported in the draft determination). On that basis, we would expect the real, pre-tax WACC for local government operated stormwater recycling schemes to fall somewhere in the range of 3.3% - 6.3%.

The calculation of the WACC is a complex exercise and without a detailed investigation, it is difficult to pre-empt exactly. However, it would be safe to assume that as a minimum, a rate toward the lower end of the range would be required for the calculation of incremental costs.

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<sup>11</sup> ESCOSA (2020), *ibid*, p. 57. In the draft determination, ESCOSA rejects Robusto's assumption of a 15 year loan repayment period and instead considers a period of 30 years for the purposes of determining financial viability.

<sup>12</sup> ESCOSA (2020) *SA Water Regulatory Determination 2020*

<sup>13</sup> The conversion formula is: Real pre-tax WACC =  $(1 + (\% \text{ debt} * \text{nominal debt rate} + \% \text{ equity} * \text{post tax return on equity} / (1 - \text{tax rate} * (1 - \text{imputation credits}))) / (1 + \text{inflation}) - 1$ . The individual elements of the calculation can be found in the Price Determination. Note that a real (i.e. net of inflation) rate of 3.3% is equivalent to a nominal rate of around 5.5% (using ESCOSA's long inflation assumption of 2.1%). The nominal, pre-tax WACC is therefore only slightly higher than the rate ESCOSA has determined as the efficient cost of debt for the water industry, which is 5.21%.



## Timeframe

The timeframe for the lower limit will depend on the strategic context for the scheme. Relevant considerations include:

- *Finite scheme life:* If the operational lifespan for the major customer(s) of the scheme are expected to be finite, it would be reasonable to align the timeframe with the customer(s) expected life. Water supplied for construction or mining might be particularly prone to shorter than average timeframes.
- *Default timeframe:* For water recycling schemes that have no fixed end date, a default timeframe of around 30 years has become generally accepted practice in Australia. While many water supply assets have expected lives beyond that timeframe, the 30 year period recognises that there is considerable uncertainty about the longevity of such schemes. While not a recycled water scheme, ESCOSA has indicated that a financing timeframe of 30 years would be suitable for a small drinking water scheme (Robusto). Before adopting any timeframe less than the expected life of the scheme, councils should also consider the longer-term impact on prices and services. If, as the scheme ages, prices need to rise sharply to recover the ongoing renewal costs, customers may no longer be willing to pay for the services and the scheme may become financially unviable. If so, councils should consider extending the timeframe to recover some of the renewal costs earlier.
- *Scheme life:* The timeframe could align with the expected life of the scheme's assets. If the scheme is expected to continue operating indefinitely, taking a timeframe slightly longer than the longest-lived asset may be appropriate. Taking a long-term view would ensure that the scheme could continue to be funded beyond the default 30 year timeframe and would also "smooth" costs across generations. The approach does come with some risk, as it is difficult to forecast technological and other changes so far in advance.

## Annuity approach

An appropriate method to calculate the impact of long-term incremental costs on pricing is to adopt what the NWI principles call the "annuity approach".<sup>14</sup> The annuity approach forecasts asset replacement and growth costs over the relevant timeframe and converts these to an annualised charge. In general, the annualised charge will be relatively smooth over time and the present value of the charge will exactly equal the present value of the incremental costs.

The annuity approach takes a long-term view and does not explicitly address short term cash flow requirements, so should also be supplemented with a year-by-year cash flow analysis. The analysis should confirm that cash and/or borrowing requirements can be met each year to ensure the scheme will remain financially viable.

## Sinking funds

Given the steady nature of income under the annuity approach, compared with the "lumpy" nature of capital expenditure, adequate financing capacity may not always be available when capital replacements are required if the income is not ringfenced for that purpose.

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<sup>14</sup> NWI Pricing Principles, p. 4.

ESCOSA has previously commented:<sup>15</sup>

*...the Commission does have some concerns over the long-term sustainability of the small-scale network asset stock and notes the importance of maintaining capital investment levels over time to smooth pricing impacts and maintain service sustainability.*

*In circumstances where capital investment levels are not maintained, the level of asset deterioration can eventually result in the need for wholesale asset replacement in a compressed time frame, with customers potentially facing both a material increase in prices and unawareness of the poor state of the assets.*

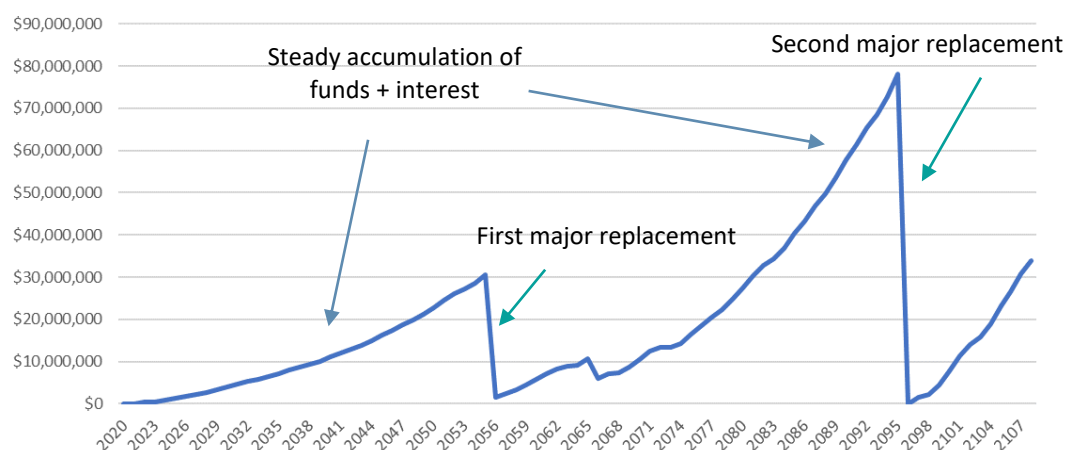
For any council concerned about future capital financing, one possible approach, mentioned in the NWI Pricing Principles<sup>16</sup> and sometimes adopted in the rural water industry, is to place any income that is intended for capital replacement into a sinking fund. A sinking fund is a special purpose fund that ensures capital funds are available as and when they are required.

One benefit of a sinking fund is that income can be invested with a long-term horizon in mind and so can target higher rates of return. The compounded return can substantially boost the original investment. As an example, an asset replacement in 50 years that costs \$100,000 in today's dollars could be funded via sinking fund contributions of \$500 per year (increased annually for CPI) if invested at a real return of 5% per year. By way of comparison, the annual depreciation allowance would be \$2,000 per year (increased annually for CPI), or four times the sinking fund contribution.

An efficient sinking fund contribution would translate directly to the lower pricing limit (for the capital component only) as it smooths the cash flow requirements over time and represents the minimum allowance that the retailer would need to set aside to ensure the scheme is appropriately maintained.

An example of a sinking fund balance is shown in Figure 1.

**Figure 1: Example of a sinking fund balance over time**



Councils establishing a sinking fund will need to understand the risks involved in long-term fund management. We recommend that prior to establishing a fund, councils seek the services of a

<sup>15</sup> ESCOSA (2020), *ibid*, p. 20

<sup>16</sup> NWI Pricing Principles, p. 6

professional fund manager to provide risk management advice and, later, to manage the day-to-day investment on council's behalf.

### Upfront customer contributions

Where there is a major extension to a scheme, it is common practice for water retailers to request an upfront contribution from new customers. Where the extension is dedicated to a single customer, it may be appropriate for the customer to fully fund the extension. Where the extension will service multiple customers or is upsized at the request of the retailer (for example, to allow for potential future customers), it may be appropriate to negotiate joint funding arrangement. Where the extension is initiated by the retailer and will service a range of customers in the future, the retailer may either fully fund the extension (and recover the cost from ongoing prices) or recover some nominal share of the extension from each subsequent customer. In any case, the retailer should ensure that upfront only recover an equitable share of the costs, taking into account the fact that ongoing prices may already include an element of capital recovery.

To avoid double counting, upfront contributions from customers should be deducted from the incremental costs for the purposes of calculating ongoing prices.

### Avoided costs and externalities

The NWI Pricing Principles note that incremental costs should be adjusted for avoided costs and externalities when determining the lower pricing limit. Such adjustments are rarely required for stormwater recycling and are discussed in more detail in Appendix 2. Two important points to note from the discussion are:

- When stormwater recycling substitutes for potable water, it may result in some avoided drinking water costs for SA Water, but these are generally offset by lower customer revenue. As the benefits of the avoided costs are already passed on to customers, there is typically no need to make any adjustments to stormwater reuse prices.
- Externalities, which are costs or benefits that affect the community or the environment, could potentially include reduced runoff to waterways or improved flood mitigation. Where they can be quantified, such benefits could potentially be used to adjust stormwater reuse prices, thereby transferring the cost from reuse customers to the general ratepayer base. The benefits could also be used as the basis for a grant or subsidy application to the state or federal government. In some cases, the externalities might be more appropriately managed through more direct means, such as improved regulation or engineered solutions.

### Summary

In summary, the lower limit under the NWI Pricing Principles is a smoothed charge that results in a present value of revenue equal to the present value of *incremental* expenditure over a timeframe that reflects the expected longevity of the scheme (usually 30 years or more), adjusted for any contributions from third parties and externalities (where applicable). In most cases, the Weighted Average Cost of Capital should be applied as the discount rate. Most stormwater recycling schemes are unlikely to require externality or avoided cost adjustments.

### 3.3. Upper limit

The upper limit identified in the NWI Pricing Principles is the lesser of standalone costs and customers' willingness to pay, which we consider in turn below.

#### Standalone costs

While not explicitly defined in the NWI Pricing Principles, the NSW economic regulator, IPART, defines the standalone cost of a recycled water scheme as: *"the cost a new and efficient competitor would incur in providing only the services associated with the recycled water scheme. Standalone cost includes all incremental costs, 100 per cent of the joint and common costs, and other costs accrued, including through a lack of efficient scale."*<sup>17</sup>

In the context of stormwater recycling, standalone costs could be either the full efficient costs of replacing the existing scheme or the cost of replacing the stormwater reuse service, which could also be implemented through household rainwater tanks.

The replication of the scheme by a new competitor would generally be much more expensive than the original cost because the original would have been constructed in the early stages of land development (i.e. on a greenfield site) while a replacement would need to be constructed on a brownfield (developed) site. The standalone costs would also exclude any government grant funding which may have offset the original capital costs.

The installation of rainwater tanks is a viable, small scale alternative to a reticulated stormwater scheme. Previous studies have shown that the cost of household size rainwater tank (2,000 litres) might vary from \$5-\$12 per kilolitre, depending on how much of the roof area is directed to the tank.<sup>18</sup>

The unit cost of either a replacement scheme or a rainwater tank is likely to be significantly higher than customers' willingness to pay for recycled water (see below), so neither are likely to form the upper limit under the NWI Pricing Principles.

#### Willingness to Pay

In most cases, the customer's willingness to pay for recycled water will form the upper limit for prices under the NWI Pricing Principles. ESCOSA notes that *"willingness to pay can be difficult to calculate, although prices agreed on negotiated contracts are a good marker."*<sup>19</sup>

A customer's willingness to pay will vary according to their circumstances, but considerations include:

- In cases where customers will utilise recycled stormwater as a substitute for drinking water, they may be willing to pay almost as much as drinking water. It is commonly assumed that recycled water customers will require a small discount off the potable water price to offset any perceived quality or health issues.

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<sup>17</sup> IPART (2019) *Ibid*, pp. 27

<sup>18</sup> Pickering et al (2007) *The cost-effectiveness of rainwater tanks in urban Australia*, produced for the National Water Commission. Results adjusted by an inflation factor of 1.32 (from 2007), calculated using RBA's inflation calculator.

<sup>19</sup> ESCOSA (2013), *ibid*, p. 42.

- In theory, it is possible that some customers might pay more than the drinking water price, particularly if it is treated to a very high level or if the customers view the product as a more sustainable 'green' product (although we are not aware of any recycled water scheme that charges more than the potable water price).
- When recycled water is used as a substitute for groundwater or is used to supply agricultural customers, customers may only be willing to pay a fraction of the drinking water price. Customers' willingness to pay will be dictated by the cost of the alternatives and/or by the increase in crop production or value. Irrigators of high value crops, such as wine grapes, may be prepared to pay significantly more than other users.

ESCOSA acknowledges that it will be acceptable for prices to be limited to the price customers are willing to pay, as long as incremental costs are being recovered. If the retailer determines that the full cost is greater than customers' willingness to pay, then any shortfall should be identified and recovered through a transparent subsidy payment. For a more complete discussion on how the full cost might be calculated, see Section 4.

## 4. FORMAL APPROACHES TO COST RECOVERY

The NWI Pricing Principles for recycled water specify that prices should recover efficient full, direct costs, provided they lie between the lower and upper limits described in the previous section. The principles specifically related to recycled water do not prescribe a methodology for determining the full cost, but two methods are described elsewhere under the NWI cost recovery principles. These methods are the building block approach and the annuity approach, which we discuss in more detail below. We also conclude with a discussion about how a council might select between the different approaches and demonstrate that the selected model will be adequate to meet future capital requirements.

While ESCOSA does not currently require M&I retailers to apply either of the approaches discussed in this section, they have committed to monitoring cost recovery. If a pattern of over or under recovery persists over a number of years, ESCOSA have highlighted that they have general powers under section 25 of the ESC Act to make more prescriptive determinations.<sup>20</sup>

### 4.1. Building block approach

To date, ESCOSA has been satisfied with a light-handed approach for the pricing of recycled water, but for those services where a more formal approach has been required (e.g. drinking water and large wastewater schemes), ESCOSA has elected to apply the building block approach. The building block approach has also been adopted by economic regulators in other Australian jurisdictions, and in similar regimes in the UK, New Zealand and elsewhere. Under the building block approach, an annual revenue requirement is calculated from the 'building blocks' of:

- operating expenditure, including maintenance and administrative costs;
- regulatory depreciation;
- a return on the Regulatory Asset Base (RAB); and
- allowances for taxation.

The regulatory depreciation and RAB will generally be less than the values reported in the annual statutory accounts because the asset values are net of any contributions made by third parties, including government grants and upfront customer contributions.

The RAB may also be lower than statutory accounting values because the NWI Pricing Principles contemplate a "line in the sand" approach, which differentiates between past (legacy) investment decisions and new investment decisions.<sup>21</sup> The line in the sand sets an opening RAB value which effectively locks in the past rate of return on historic investments. In theory, the opening RAB could be zero if the organisation did not historically require any rate of return. After the opening RAB is established, it would then be updated (or rolled forward) each year to reflect prudent capital additions, disposals and depreciation.

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<sup>20</sup> ESCOSA (2013), *ibid*, p. 43.

<sup>21</sup> NWI Pricing Principles, p. 5.

The NWI cost recovery principles identify the latest cut-off date for the “line in the sand” as 1 January 2007, but as ESCOSA has not indicated that water recycling prices need conform with the NWI cost recovery principles, a later date could conceivably be acceptable (subject to confirmation with ESCOSA). The line in the sand approach offers considerable scope for alleviating price shocks when transitioning into the building block regime.

The rate of return for the ROA calculation is usually set at the industry Weighted Average Cost of Capital (WACC), which is a weighted average of typical debt (interest) and equity obligations. The WACC does not refer to the actual debt or equity costs incurred by a business, but rather assumes an efficient mix of debt and equity based on industry benchmarks. In theory, the WACC provides a return that is sufficient to repay typical interest costs and provide a return that would be acceptable to a commercial investor, taking the industry risk profile into account. As noted in the previous section, we would expect the real pre-tax WACC for recycled water businesses to lie somewhere in the range of 3.3% to 6.3% based on recent price determinations by ESCOSA.

To calculate the RAB, a record of the third-party contributions will need to be maintained and netted from the asset values each year.

## 4.2. Renewals annuity approach

While the building block approach is generally preferred by economic regulators, the NWI cost recovery principles also allow for a ‘renewals annuity approach’. The renewals annuity approach forecasts asset replacement and growth costs over a fixed period and converts them to an annualised charge. The annuity approach was discussed in relation to the lower limit in Section 3.2.

The annuity approach will be more appropriate if the building block approach generates a price below the incremental cost of the scheme (the NWI lower limit). The building block approach is a *backward looking* approach to pricing (basing the opening RAB on historic capital expenditure) while the annuity approach is focussed on future expenditure and maintaining the financial viability of the scheme.

By way of example, if a scheme’s assets were primarily funded through government grants, the RAB and regulatory depreciation could be very low. In this case, the building block prices may only recover slightly more than the operating and maintenance costs. The low capital allowance may not generate enough cash flow to fund the full replacement of the scheme and may dissuade financial institutions from lending the required amount as the historic cash flows would not demonstrate that adequate repayments could be made. Under the building block approach, prices would also need to increase sharply as soon as the assets were replaced. By contrast, the annuity approach would smooth price increases over time and would ensure a regular and adequate allowance to meet capital expenditure requirements, which might be achieved through a sinking fund, or would provide evidence to a financial institution that prices would support the required loan repayments.

Under the renewals annuity approach, retailers can also recover the initial investment in the scheme by applying a return on capital (the WACC) to the undepreciated asset base (net of grants and customer contributions). This method effectively annualises the original investment into perpetuity, so there will be no depreciation allowance included for the original investment.

If a renewals annuity approach is adopted, we recommend a fixed long-term timeframe with reviews of the underlying assumptions at least every 5 years. A continuously rolling timeframe is more difficult to explain to customers because prices will vary from year to year, even when there were no changes in underlying assumptions. The timeframe will eventually need to roll forward, either because a major change has occurred or a major review is due, at which time council would need to ensure a credit was included for any surplus of funds recovered from customers to date.

### 4.3. Choosing between pricing methods

The NWI Pricing Principles for recycled water do not prescribe the approaches to pricing, only that prices must only lie between the NWI's upper and lower limits. However, the building block and the renewals annuity methods are the only two approaches explained in detail in the NWI's principles for the recovery of capital expenditure.

The choice of pricing approach should be informed by both theoretical and practical considerations. ESCOSA has noted that the building block approach is consistent with the NWI Pricing Principles, simpler to apply than the annuity approach, and allows the costs to be more easily identified and articulated to third parties.<sup>22</sup> The building block approach is also consistent with the regulated approach to pricing for drinking water and wastewater services, so is well established and has been developed in great detail.

One important consideration before adopting the building block approach is whether the resulting prices will cover capital renewal costs. In some cases, the building block approach can result in higher short-term prices than the renewals annuity approach.<sup>23</sup> But if the recycled water assets were historically funded through grants or customer contributions, the building block method can result in prices lower than the incremental costs of the scheme. These prices might remain low over the medium term and then spike up in the future when asset replacements are made using council funds or borrowings. Unlike the building block approach, the renewals annuity approach considers forward-looking costs, so more accurately conveys costs associated with future incremental expenditure.

We note that the building block approach and the renewals annuity approach cannot both be used simultaneously. If applied together, they would double count the costs of the scheme.

Under either approach, councils may need to consider a 'line in the sand' write down of the historic asset values if the resulting prices are than higher than customers' willingness to pay for the services.

Regardless of the approach, we recommend that the scheme's year-to-year cash flow forecasts are examined to determine whether there will be cash shortfalls that require funding, particularly over the short or medium term. If so, council should identify a strategy for funding these shortfalls (e.g. through internal reserves or borrowings), or consider establishing a sinking fund and adjusting the pricing such that it will eliminate any forecast shortfalls.

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<sup>22</sup> Pers comms: email to City of Marion, 26/2/2021.

<sup>23</sup> Because the building block approach includes a depreciation allowance on existing assets, which may be higher than the annuity allowance – in the short term at least.





## 5. SUMMARY OF PRICING METHODOLOGIES

ESCOSA's Price Determination in relation to M&I retailers requires them to adopt transparent pricing policies and to apply the NWI Pricing Principles. The NWI Pricing Principles for recycled water specify that prices should recover the efficient full, direct costs of supplying the service, with:

- a **lower limit** of system-wide incremental costs (adjusted for avoided costs and externalities); and
- an **upper limit** of the lesser of:
  - o stand-alone costs; and
  - o customer willingness to pay.

The lower limit should, as a minimum, cover the **incremental costs** required to ensure the scheme remains viable in cash flow terms, which includes operating and maintenance costs plus an annualised allowance for capital replacement and renewals. Where replacement is not expected for many years, the allowance might be less than the statutory depreciation allowance. The lower limit can potentially be adjusted downward if the retailer can identify externalities (costs or benefits to third parties) that would warrant doing so.

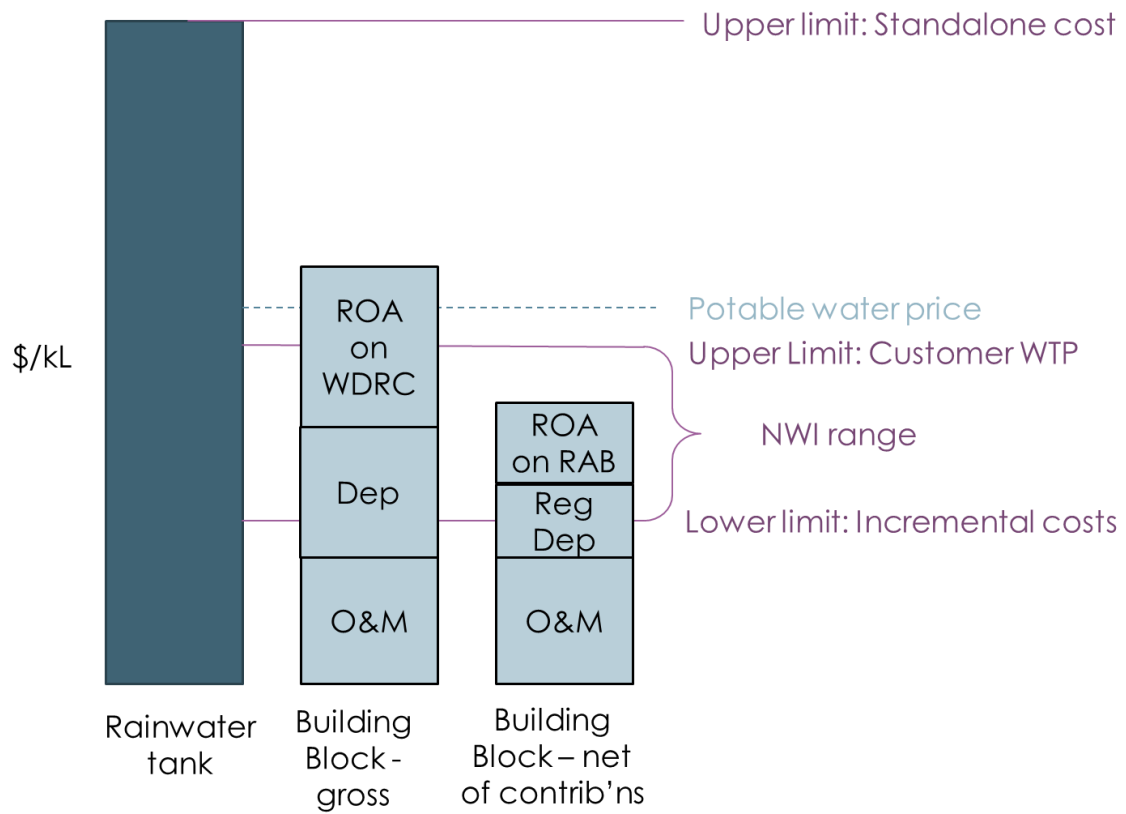
The **standalone costs**, which could be either the cost of replacing the scheme or the cost of an on-site solution (i.e. a rainwater tank), is typically higher than the customers' willingness to pay. Therefore, the NWI upper limit will usually be the customers' **willingness to pay** for recycled water, which is generally assumed to be slightly below the cost of drinking water (although there could be exceptions if the recycled water is more highly valued than drinking water).

While ESCOSA has indicated that it will apply a light-handed approach, it will continue to monitor prices and has the authority to apply a more prescriptive regime if necessary. M&I retailers who wish to 'future proof' their pricing could consider moving toward the '**building block**' approach, which has been adopted by economic regulators across Australia and will usually fall between the NWI lower and upper limits.

The building block approach sets a revenue target equal to the sum of the operating and maintenance costs, regulatory depreciation and a return on the Regulatory Asset Base. Regulatory depreciation and the Regulatory Asset Base are usually less than the statutory accounting values because they are net of government grants and upfront customer contributions. They might also be written down to reflect a 'line in the sand' opening value. The rate of return is usually set at the Weighted Average Cost of Capital, which recent evidence suggests might fall between 3.3% and 6.3%.

A visual summary of the different approaches for a typical (financially viable) recycled water scheme is shown in Figure 2.

**Figure 2: Different pricing approaches for a typical (financially viable) reuse scheme**



## Appendix 1: NWI Pricing Principles for recycled water and stormwater

### **Principle 1: Flexible regulation**

Light handed and flexible regulation (including use of pricing principles) is preferable, as it is generally more cost-efficient than formal regulation. However, formal regulation (e.g. establishing maximum prices and revenue caps to address problems arising from market power) should be employed where it will improve economic efficiency.

### **Principle 2: Cost allocation**

When allocating costs, a beneficiary pays approach — typically including direct user pay contributions — should be the starting point, with specific cost share across beneficiaries based on the scheme's drivers (and other characteristics of the recycled water/stormwater reuse scheme).

ESCOSA comments (Price Determination, p. 39-40):

*Cost allocation and determining beneficiaries Principle 2 (Cost allocation), states that retailers should use the beneficiary pays approach when allocating costs. The beneficiaries of a recycled water scheme, for example, would be sewerage customers whose wastewater is recycled, recycled water customers, and potentially other groups which benefit from the effluent being used rather than disposed of.*

*The Commission recognises that the beneficiaries of recycled and stormwater schemes may not always be apparent and there are complexities in allocating costs to beneficiaries. However, the Commission has the expectation that retailers will have performed some analysis of this during their initial project appraisal to determine the scheme's economic viability.*

*...the National Water Commission (NWC) states, in its paper on pricing principles for recycled water and stormwater reuse, that assignment of cost shares should have regard to the endpoint objectives of the scheme, to reflect that there can be tensions between 'equitable cost recovery from beneficiaries' and long-term price signalling to induce use-substitution.*

*The Commission understands this to mean that depending on whether a scheme's main driver is either demand or supply oriented (and either a voluntary or mandated scheme) it is expected to have an impact on retailers' pricing decisions and the allocation of costs to different beneficiaries. In section 7.6 [relating to Principle 7], the Commission provides some examples of how retailers should allocate costs between beneficiaries of a recycled water scheme.*

**NCE comments:** ESCOSA's focus in responding to Principle 2 is on recycled wastewater schemes, which are used as both a means of wastewater disposal (so benefiting wastewater customers) and as a means of water supply (so benefiting recycled water customers). We discuss cost allocation in relation to stormwater recycling schemes in more detail in Section 3.2.

### **Principle 3: Water usage charge**

Prices to contain a water usage (i.e. volumetric) charge.

ESCOSA comments (Price Determination, p. 40):

*The Commission proposes to allow recycled water and stormwater retailers to not apply a usage charge, if they can determine, to the satisfaction of the Commission, that it is not cost effective to do so. This is consistent with Principle 2 (Tariff Structure) in the Principles for urban water tariff, and applies the principle of light handed and flexible regulation of recycled water and stormwater services.*

*Determination of cost effectiveness of applying usage charges will be a matter for the relevant retailer, but retailers will need to supply evidence demonstrating this to the Commission (and update this if and when material changes to relevant circumstances arise).*

### **Principle 4: Substitutes**

Regard to the price of substitutes (potable water and raw water) may be necessary when setting the upper bound of a price band.

ESCOSA comments (Price Determination, p. 40):

*The Commission notes that a number of retailers have chosen to link their current recycled water and stormwater prices with SA Water prices (for potable water). Principle 4 permits this approach, however, retailers must ensure that their pricing regime is in compliance with the other pricing principles, in particular that there is the aim to achieve full cost recovery, and where full cost recovery is not being achieved, any gap is transparently recovered and reported, per Principle 7. The Commission would also be concerned if the application of SA Water's prices led to a significant over-recovery of efficient costs.*

*Pricing structures should also be able to reflect differentiation in the quality or reliability of water supply, per Principle 5 of the Recycled Water and Stormwater Use pricing principles.*

**NCE comments:** The price of substitute products – in particular potable water – has a direct bearing on the upper limit of prices under Principle 7. The upper pricing limit, and therefore the role of substitute products, is considered in more detail in Section 3.3.

### **Principle 5: Differential pricing**

Pricing structures should be able to reflect differentiation in the quality or reliability of water supply.

**NCE comments:** For many stormwater recycling schemes, there is often no substantial difference in water quality or reliability between customers, so this principle may only apply in a limited number of circumstances.

### **Principle 6: Integrated water resource planning**

Where appropriate, pricing should reflect the role of recycled water as part of an integrated water resource planning (IWRP) system.

ESCOSA comments (Price Determination, p. 40):

*Principle 6 of the recycled water and stormwater pricing principles involves the concept of Integrated Water Resource Planning, which the Commission has interpreted as relating to the idea that alternative water supply options can be utilised to balance demand and supply and consequently minimise system-wide costs. This allows water retailers to consider the role of the River Murray (and any other climate dependent sources of water) in developing its portfolio of water sources, providing there is consideration of the costs and benefits to customers.*

*The Commission recognises that there is inherent value in highly secure water sources and that it is important to optimise the supply of water sources so that customers can receive water at the lowest sustainable cost.*

**NCE comments:** Under certain circumstances, stormwater recycling may play a role in reducing stormwater management costs and/or potable water costs. We discuss stormwater recycling's role in IWRP and the impact of avoided costs on pricing in Section 3.2.

### **Principle 7: Cost recovery**

Prices should recover efficient, full direct<sup>i</sup> costs — with system-wide incremental costs (adjusted for avoided costs and externalities) as the lower limit, and the lesser of stand alone costs and willingness to pay (WTP) as the upper limit. Any full cost recovery gap should be recovered with reference to all beneficiaries of the avoided costs and externalities. Subsidies and Community Service Obligation (CSO) payments should be reviewed periodically and, where appropriate, reduced over time.

Notes:

- i. Direct costs include any joint/common costs that a scheme imposes, as well as separable capital, operating and administrative costs. This definition of direct costs does not include externalities and avoided costs.

**NCE comments:** Principle 7 provides the most comprehensive guidance on pricing, and details the means by which some of the other principles should be incorporated into price calculations. Principle 7 forms the primary focus of our discussion in Section 3. Please see that section for more information, including comments from ESCOSA.

### **Principle 8: Transparency**

Prices should be transparent, understandable to users and published to assist efficient choices.

ESCOSA comments (Price Determination, p. 43-44):

*Principle 8 states that prices should be transparent, understandable to users, published (to assist efficient choices) and that the principles apply to all recycled water/stormwater schemes.*

*...The Commission wishes to see pricing information, for each retail service, that clearly sets out the tariffs to be paid by customers. This information would be included in the retailer's Pricing Schedule. The retailer's Pricing Policy Statement sets out how retailers have developed prices, and how pricing arrangements meet the NWI Pricing Principles.*

*The Commission wishes to receive from retailers, through reporting of regulatory financial statements, the cost make up of prices. This should help demonstrate any profit margin or return on capital element included in prices.*

*... The Commission does not consider it appropriate to require formal approval of retailer's pricing models, as this is not consistent with the Commission's intention to apply a light handed form of price regulation for Minor and Intermediate Retailers. However, the Commission wishes to work with retailers to make compliance with the pricing principles as smooth as possible and is happy to provide input into the price setting process if requested.*

### **Principle 9: Gradual approach**

Prices should be appropriate for adopting a strategy of 'gradualism' to allow consumer education and time for the community to adapt.

ESCOSA comments (Price Determination, p. 44):

*The Commission recognises that some retailers will not currently be undertaking pricing practices in line with the NWI Pricing Principles and that there should be a transition period for prices to comply with NWI Pricing Principles. This reflects the likelihood that implementing the pricing principles may require some process changes for retailers, and recognises that retailers may have entered into contracts with customers for a defined period at a set price.*

*Principle 9 (Gradual approach) requires retailers to adopt a pricing strategy for recycled water and stormwater services that allows for consumer education and the community to adapt.*

*... In the case of new retailers, the Commission expects that they will develop their pricing structure in accordance with the pricing principles and will be required to demonstrate this through their Pricing Policy Statement like all other retailers. The pricing principles are intentionally flexible to allow for differing pricing regimes, and recognise that pricing structures may change as a scheme matures. The Commission appreciates that for new retailers, or retailers of new schemes, there may be limited data available. The Commission will bear this in mind in accessing retailers' Pricing Policy Statement and reported financial information.*

## Appendix 2: Avoided costs and externalities

### Avoided costs

The NWI Pricing Principles note that incremental costs should be adjusted for avoided costs and externalities when determining the lower pricing limit. In its Price Determination, ESCOSA provides an example of avoided costs, in which a recycled water scheme delays or negates the need for augmentation of a drinking water supply. The example foresees the avoided costs accruing to the retailer, but in the case of council run stormwater recycling schemes, the avoided costs would actually accrue to a third party – SA Water. In that case, the appropriate mechanism for recognising avoided costs would be for the operators of the stormwater recycling scheme to seek a funding contribution from SA Water.

An important consideration is that while SA Water might delay drinking water augmentations, they will also lose drinking water revenue, which is likely to result in a net financial shortfall rather than a gain. Consequently, we expect that there would only be a limited number of circumstances in which SA Water might consider contributing to a council run stormwater recycling scheme.

For recycled wastewater, the avoided costs may include reductions in the cost of wastewater disposal, such as evaporation ponds or ocean outfalls. Wastewater recycling can reduce sewerage costs but does not reduce the number of customers or the volume received from those customers, so will not affect sewerage revenue. The sewerage scheme might therefore validly make a contribution to the water recycling scheme, thereby lowering the incremental cost that must be recovered from recycled water customers. As this report is being produced for the MAR user group, we will not elaborate on methods of cost apportionment, but refer the interested reader to the Australian Water Recycling Centre of Excellence (2013) *Economic Viability of Water Recycling*.

### Externalities

The lower pricing limit also includes an adjustment for the value of externalities, which are costs or benefits that affect parties other than the buyer and seller of a good or service, including environmental and social costs and benefits. Positive externalities (benefits) from stormwater recycling could potentially include reduced runoff to waterways, improved flood mitigation or reduced stress on drinking water sources. ESCOSA acknowledges that such externalities could potentially play a role in recycled water pricing but note that quantifying externalities is a difficult task and also that many externalities are currently appropriately managed through regulation (e.g. EPA effluent discharge rules to watercourses).

If an externality can be identified and the extent of the benefit quantified, then there are a number of economic tools available to monetise such benefits and translate them into a deduction from the lower limit. As the beneficiaries are usually local residents, it will usually be appropriate for the deduction to be funded through local council rates, or alternatively through State or Commonwealth Government funding.

If the price shortfall is known but the value of the externality is not, it may be possible to use a threshold analysis, which asks how much the externality would need to be to justify the known price reduction.



Externalities are usually highly specific to a local area, so would need to be addressed in detail on a case-by-case basis.