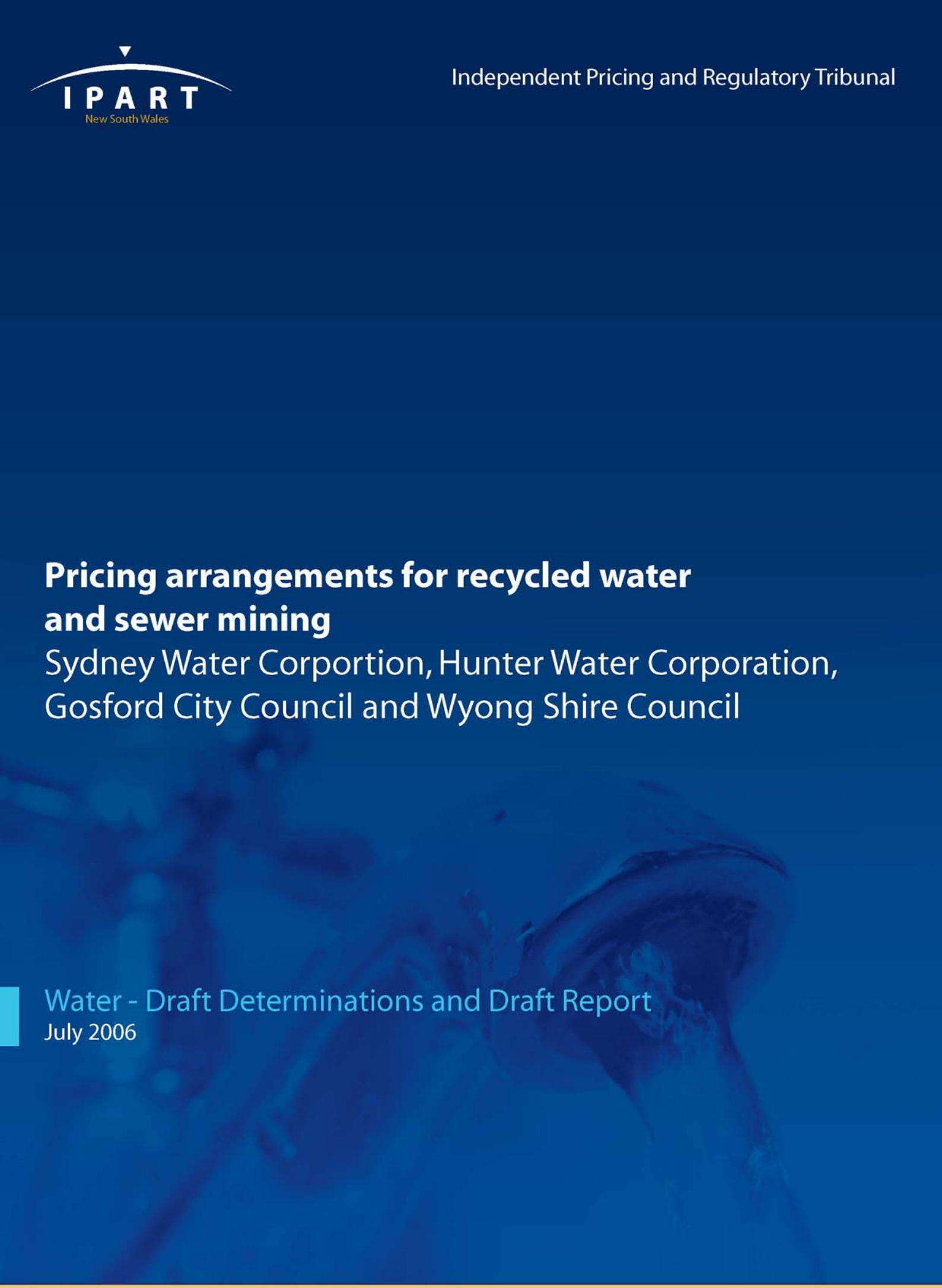
IPART
New South Wales

Independent Pricing and Regulatory Tribunal

Pricing arrangements for recycled water and sewer mining

Sydney Water Corportion, Hunter Water Corporation, Gosford City Council and Wyong Shire Council



Water - Draft Determinations and Draft Report

July 2006

IPART
New South Wales

Independent Pricing and Regulatory Tribunal

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Water - Draft Determination and Draft Report

July 2006

Draft Determinations Nos 8 and 9, 2006

July 2006

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Draft Determination No 8, 2006

Section 11(1)
Independent Pricing and Regulatory Tribunal Act 1992

Developer Recycled Water Charges

Independent Pricing and Regulatory Tribunal
of New South Wales

Reference No: 05/549

D2005/12774

1 Background

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

(2) Each Water Agency is listed as a government agency for the purposes of schedule 1 of the IPART Act. The services of each Water Agency declared as monopoly services under the *Independent Pricing and Regulatory Tribunal (Water, Sewerage and Drainage Services) Order 1997* **(Order)** are:

(a) water supply services;

(b) sewerage services;

(c) stormwater drainage services;

(d) trade waste services;

(e) services supplied in connection with the provision or upgrading of water supply and sewerage facilities for new developments and, if required, drainage facilities for such developments;

(f) ancillary and miscellaneous customer services for which no alternative supply exists and which relate to the supply of services of a kind referred to in paragraphs (a) to (e);

(g) other water supply, sewerage and drainage services for which no alternative supply exists.

(3) In accordance with section 13A of the IPART Act, the Tribunal has established a methodology for fixing the maximum price for Developer Recycled Water Services (being "monopoly services" under clause 2(f) of this section). Schedule 4 sets out the Tribunal's reasons for choosing to make a determination that involves setting the methodology for fixing a maximum price.

(4) In establishing a methodology for fixing the maximum price for Developer Recycled Water Services, the Tribunal has had regard to a broad range of matters, including the criteria set out in sections 14A and 15(1) of the IPART Act.

(5) Under section 18(2) of the IPART Act, a Water Agency may not fix a price below the price determined by the methodology prescribed by this determination without the approval of the Treasurer.

2. Application of this determination

(1) This determination sets a methodology for fixing the maximum prices that a Water Agency may charge for Developer Recycled Water Services specified in this determination.

(2) This determination commences on the later of 1 October 2006 and the date that it is published in the NSW Government Gazette (**Commencement Date**).

(3) This determination applies to the calculation of charges for Developer Recycled Water Services for all new Developments or stages of Development and re-

developments within an existing or new Development Servicing Plan from the Commencement Date except as follows:

(i) for Sydney Water Corporation, where, before the Commencement Date, it has issued a compliance certificate pursuant to Section 73 of the *Sydney Water Act, 1994* for a Development or stage of Development;

(ii) for Hunter Water Corporation where, before the Commencement Date:

(1) it has issued a compliance certificate pursuant to Section 50 of the *Hunter Water Act, 1991* for a Development or stage of Development; or

(2) it has served a notice pursuant to Section 50 of the *Hunter Water Act, 1991* in respect of a Development in which case the assessment stands for the period specified in the notice;

(iii) for Gosford City Council where, before the Commencement Date, it has given a written "notice of requirements" pursuant to Section 306 of the *Water Management Act, 2000* in respect of a Development or stage of Development in which case the assessment stands for the period specified in the notice of requirements;

(iv) for Wyong Shire Council where, before the Commencement Date:

(1) it has issued a development consent pursuant to Section 91 of the *Environmental Planning and Assessment Act, 1979* in respect of a Development or stage of Development and such consent incorporates relevant Recycled Water charges and/or conditions in accordance with Section 306 of the *Water Management Act, 2000*; or

(2) it has advised the relevant Recycled Water charges and/or conditions to a Developer in accordance with Section 306 of the *Water Management Act, 2000*;

(4) In implementing this determination, a Water Agency must use a calculation spreadsheet that has been approved by the Tribunal.

(5) The methodology in this determination applies from the Commencement Date until this determination is replaced.

3. Determination No 9, 2000

Determination No 9, 2000 applies to a Water Agency's Services (as defined in that determination) except Developer Recycled Water Services (as defined in this determination).

4. Monitoring

The Tribunal may monitor the performance of a Water Agency for the purposes of:

(a) establishing and reporting on the level of compliance by that Water Agency with this determination; and

(b) preparing a periodic review of pricing policies in respect of the Developer Recycled Water Services supplied by that Water Agency.

5. Schedules

Schedule 1 (read with schedules 2 and 3) sets out the methodology for determining the maximum prices that a Water Agency may charge for Developer Recycled Water Services.

7. Definitions and interpretation

Definitions and interpretation provisions used in this determination are set out in schedule 5.

Schedule 1

Developer Recycled Water Services

1. Application

This Schedule prescribes the methodology for determining the maximum prices that a Water Agency may charge for Developer Recycled Water Services.

2. Charges for Developer Recycled Water Services

The maximum price per Equivalent Tenement that may be levied by a Water Agency for the provision of Developer Recycled Water Services to a Developer is the following:

$$DRWC = \frac{K_1}{L} + \frac{K_2}{L} - \frac{NPV\ (Ri - Ci)}{L} - \frac{PV(ACi)}{L} \text{ for i = years 1, 2….n}$$

Where:
DRWC –Developer Recycled Water Charge per Equivalent Tenement
K_1 – Capital Charge for Pre 2006 Assets which will serve the DSP Area calculated on an NPV basis discounted at rate r
K_2 – Capital Charge for Post 2006 Assets which will serve the DSP Area calculated on an NPV basis discounted at rate r
L - the Present Value of the number of Equivalent Tenements in the DSP Area and the Present Value of the number of Equivalent Tenements to be developed in the DSP Area, calculated at discount rate r
R_i – future Operating Revenues in each year i
C_i – future Operating Costs in each year i
r – the Discount Rate
n – the forecast period for the assessment of expected revenues and costs and is 30 years from the date of calculating the DRWC
AC – Avoided Costs

3. Assessment of Assets

3.1 Identification of Assets

A Water Agency must clearly identify the Assets in the relevant Development Servicing Plan developed under schedule 3 of this determination.

3.2 Valuation of Assets

A Water Agency must use the following valuation method when valuing its Assets:

Commissioning Date	Valuation Method
Pre 2006 Assets	MEERA
Post 2006 Assets already commissioned	MEERA
Post 2006 Assets yet to be commissioned	Estimated Efficient Costs

3.3 Apportionment of Assets

If an Asset services a DSP Area (**Single DSP Area**) and another DSP Area (**Other DSP Area**) the value attributable to that Asset that services a Single DSP Area is calculated as follows:

$$V = \left(\frac{E}{T}\right) x \; CC$$

Where:
V – value of the Asset that services the Single DSP Area
E – expected utilisation of the Asset servicing the Single DSP Area
T – total expected utilisation of the Asset for the Single DSP Area and the Other DSP Area
CC – Capital Charge

4. Capital Charges

4.1 Calculation of Capital Charges

All Assets must be included when calculating Developer Recycled Water Charges other than the following Assets:

(a) an Asset that is capable of servicing a DSP Area because that Asset is no longer servicing the land use function for which it was originally commissioned; or

(b) an Asset that was funded by a Developer and transferred free of charge to the relevant Water Agency; or

(c) an Asset that was commissioned for a reason other than to service growth, such as to accommodate amendments to environmental protection legislation; or

(d) an Asset that was significantly and unreasonably oversized in respect of system and capacity requirements in light of the relevant demographic statistics available for the DSP Area at the time that Asset was commissioned.

4.2 Capital Charges for Pre 2006 Assets

Subject to clause 4.1, a Water Agency must calculate a Capital Charge for Pre 2006 Assets by applying the following steps:

(a) estimate the value of the relevant Assets, in accordance with clause 3.2 above, as at the Commencement Date;

(b) convert the value to Real Terms; and

(c) the expenditure on those Assets in Real Terms must then be converted by the Discount Rate, to Present Values, as at the Commencement Date.

4.3 Capital Charges for Post 2006 Assets commissioned on or after the Commencement Date

Subject to clause 4.1, a Water Agency must calculate a Capital Charge for Post 2006 Assets commissioned on or after the Commencement Date by applying the following steps::

(a) estimate the value of the relevant Assets in accordance with clause 3.2 above, as at the Commencement Date;

(b) convert the value to Real Terms; and

(c) the expenditure on those Assets in Real Terms must then be converted by the Discount Rate, to Present Values.

4.4 Capital Charges for Post 2006 Assets yet to be commissioned

4.4.1 Subject to clause 4.1, a Water Agency must calculate a Capital Charge for Post 2006 Assets yet to be commissioned by applying the following steps:

(a) estimate the value of the relevant Assets in accordance with clause 3.2 above, as at the Commencement Date;

(b) convert the value to Real Terms; and

(c) the expenditure on those Assets in Real Terms must then be converted by the Discount Rate, to Present Values.

4.4.2 Once an Asset is commissioned it will be considered a Post 2006 Asset. The Water Agency must calculate the Capital Charge for that Asset by applying clause 4.3 at the next review that is provided for under clause 9.2.

4.4.3 When estimating the capital costs of Post 2006 Assets yet to be commissioned, the Water Agencies must examine all available options and choose the option that is the most efficient.

4.5 Temporary supply

Where a Water Agency:

(a) temporarily supplies Developer Recycled Water Services to a Development from an existing Asset; and

(b) transfers the supply of Developer Recycled Water Services to that Development from an existing Asset to a new Asset that has just been commissioned,

then only the costs of the new Asset must be included in calculating the Developer Recycled Water Charge.

4.6 Timing of anticipated expenditure

Where a proposed Development influences the timing of a Water Agency's anticipated expenditure on an Asset (**Anticipated Expenditure**), the Anticipated Expenditure must be included in the calculation of the Developer Recycled Water Charge by:

(a) estimating the extent to which the proposed Development would bring forward the timing of the Anticipated Expenditure, as compared with the timing of the Anticipated Expenditure if that Development did not proceed;

(b) calculating the difference in the Net Present Value between the Anticipated Expenditure that may arise due to that change in timing (**Calculated Cost**); and

(c) including the Calculated Cost as a cost to the Development only if the Calculated Cost exceeds the cost of any comparable existing Assets used by the Development and the cost of the comparable existing Assets are not included in the calculation.

5 Projection of Operating Costs

5.1 The Operating Costs must:

(a) be based on the most efficient and lowest cost means of providing the Customer Recycled Water Services;

(b) assume the continuation of the service standards set out in the Development Servicing Plan; and

(c) reflect costs associated with the specific Customer Recycled Water Services provided.

5.2 If the costs of providing Customer Recycled Water Services to DSP Area vary significantly from the system-wide operating, maintenance and administration costs, then system-wide averages must not be used.

6 Projection of Operating Revenues

6.1 A Water Agency must calculate the Operating Revenues arising from a DSP Area by:

(a) using the assumption that the Assets used to provide Recycled Water Services for that DSP Area are used efficiently; and

(b) using relevant Periodic Charges applied to the consumption of an average customer in the relevant customer class and the periodic price path determined by the Tribunal from time to time.

6.2 A Water Agency must assume that residential charges are uniform across the Water Agency Area unless the Tribunal, by determination, has approved differential Periodic Charge.

6.3 A Water Agency's projection of Operating Revenues arising from DSP Area must be formulated to best meet the needs of its users, including Developers, based on the service standards set out in the relevant Development Servicing Plan.

7 Period of analysis for Operating Revenues and Operating Costs

Future Operating Costs and Operating Revenues must be projected over a 30 year period from the date of each review of the Developer Recycled Water Charge under clause 9 of this schedule and calculated using the parameters in schedule 2.

8 Demographic assumptions

Demand for the Customer Recycled Water Services and Developer Recycled Water Services arises from, in part, population growth and changes in urban density. Forecasts by Water Agencies of population and densities must have regard to the latest demographic statistics published by the NSW Department of Planning for the Water Agency Area or a comparable area. For local works, the demographic statistics used must be locality specific (that is, at the local government level). For system wide works, such as Headworks, the demographic statistics used must be for the relevant Water Agency Area.

9 Development Servicing Plan

9.1 Information to be included in DSP

Each Water Agency must prepare a development servicing plan (**Development Servicing Plan**) which contains the information set out in schedule 3 of this determination before that Water Agency is permitted to levy a Developer Recycled Water Charge.

9.2 Reviews of DSP and Developer Recycled Water Charges

Each Water Agency must thereafter:

(a) review their Development Servicing Plan and Developer Recycled Water Charge once, and no more than once, in each five year period from the date that the Development Servicing Plan is prepared; and

(b) review their Developer Recycled Water Charge when and to the extent required by a determination of the Tribunal.

10 Indexation of Developer Recycled Water Charges

If there is not a review of Developer Recycled Water Charge under clause 9.2 of this schedule during any given year, the Developer Recycled Water Charge then prevailing will be indexed annually by **Δ**CPI for each year (or part of a year) until the Developer Recycled Water Charge is reviewed under clause 9.2 of this schedule.

11 Impacts of charges

Water Agencies must publish any revised Developer Recycled Water Charge and the previous Developer Recycled Water Charge, or range of Developer Recycled Water Charges, in their Development Servicing Plans.

Schedule 2

Parameters for calculating Operating Revenues and Operating Costs

The following parameters apply to the calculation of Operating Revenues and Operating Costs:

1 Sydney Water Corporation

(a) Discount Rate – the real pre-tax rate of return for Sydney Water Corporation stated in the Tribunal's Report Nos 5, 6 and 7, 2005 (as replaced and amended from time to time)

(b) Consumption of 110 kilolitres per annum for an average residential customer

2 Hunter Water Corporation

(a) Discount Rate – the real pre-tax rate of return for Hunter Water Corporation stated in the Tribunal's Report Nos 5, 6 and 7, 2005 (as replaced and amended from time to time)

(b) Consumption of 110 kilolitres per annum for an average residential customer

3 Gosford City Council

(a) Discount Rate – the real pre-tax rate of return for Gosford City Council stated in the Tribunal's Report Nos 2 and 3, 2006 (as replaced and amended from time to time)

(b) Consumption of 110 kilolitres per annum for an average residential customer

4 Wyong Shire Council

(a) Discount Rate – the real pre-tax rate of return for Wyong Shire Council stated in the Tribunal's Report Nos 2 and 3, 2006 (as replaced and amended from time to time)

(b) Consumption of 110 kilolitres per annum for an average residential customer

Schedule 3

Information to be included in DSP

1. Each Water Agency must develop a Development Servicing Plan that covers each DSP Area. A Development Servicing Plan must provide, as a minimum, the following for each DSP Area:

   (a) a summary of the contents of the Development Servicing Plan;

   (b) the extent of the DSP Area including:

      (1) its size;

      (2) the basis for defining its boundaries; and

      (3) the reference to other DSPs where there is an overlap or co-usage of Assets;

   (c) demographic and land use planning information including:

      (1) the current resident population;

      (2) the estimated Equivalent Tenements as at the Commencement Date;

      (3) the projected population over the planning horizon of the DSP; and

      (4) the projected Equivalent Tenements over the planning horizon of the DSP;

   (d) timing of works including:

      (1) completed capital works; and

      (2) proposed capital works;

   (e) the standards of service to be provided to customers in the DSP Area and design parameters of Assets;

   (f) the calculated Developer Recycled Water Charge, and the information used to calculate the Developer Recycled Water Charge, including:

      (1) the future periodic revenues expected to be received from new customers in the DSP Area each year;

      (2) Periodic Charges used for that calculation;

      (3) average water usage figures used for that calculation;

      (4) the future expected annual Operating Costs of providing Customer Recycled Water Services to new customers in the DSP Area in each year; and

      (5) indexation principles and parameters used for that calculation;

   (g) a description, or reference to a background document containing the description, of the Pre 2006 Assets and Post 2006 Assets including:

      (1) the date (or forecast date) of the commissioning of the Assets;

      (2) the size/length of the Assets;

      (3) the actual efficient cost of the Assets as listed in asset register of the relevant Water Agency or other source acceptable to the Tribunal (where applicable);

      (4) the unit cost of each of the Asset (if applicable);

(5) the MEERA valuation of the Assets (if applicable);

(6) the total Asset capacity in Equivalent Tenements (if applicable); and

(7) the details of the Equivalent Tenements served by an Asset in each DSP Area where such Assets serve more than one DSP Areas.

2. Following preparation of a draft Development Servicing Plan, a Water Agency must:

(a) publicly exhibit the draft Development Servicing Plan at least 30 working days prior to that Water Agency adopting that Development Servicing Plan (**Exhibition Period**);

(b) prepare and make available upon request by interested parties a background document which includes all of the critical data behind the draft Development Servicing Plan, including the models used to calculate the Developer Recycled Water Charges, in order for interested parties to assess the draft Development Servicing Plan and make informed written submissions on that draft Development Servicing Plan to that Water Agency;

(c) advertise in a local newspaper with a circulation covering the Water Agency Area, the start date of the exhibition period, the length of the Exhibition Period and that written submissions on the draft Development Servicing Plan can be made to that Water Agency during the exhibition period;

(d) at least 10 working days before the start date of the exhibition period, inform [the Urban Development Institute of Australia], [the Housing Industry Association], any association representing Developers active in the DSP Area and any Developers who had applied for Planning Approval any time in the 6 months prior to the commencement of the exhibition period.

3. In finalising a Development Servicing Plan a Water Agency must consider all submissions made to it by interested parties on the draft Development Servicing Plan.

4. Once a Water Agency has adopted the Development Servicing Plan, that Water Agency must forward the Development Servicing Plan to the Tribunal for registration. At the time of forwarding the DSP, that Water Agency is to inform the Tribunal of any submissions lodged during the exhibition period and that Water Agency's responses to the submissions.

5. Planning Approval in this schedule means:

(a) a compliance certificate issued by Sydney Water Corporation pursuant to section 73 of the *Sydney Water Act, 1994*;

(b) a compliance certificate or notice issued by Hunter Water Corporation pursuant to section 50 of the *Hunter Water Act, 1991*;

(c) [a notice of requirements issued by Gosford City Council pursuant to section 306 of the *Water Management Act, 2000*; or

(d) a development consent issued by Wyong Shire Council pursuant to section 91 of the Environment Planning and Assessment Act, 1979 where that development consent incorporates relevant recycled water charges and conditions in accordance with section 306 of the *Water Management Act, 2000*; or

(e) a charge and/or condition as advised by Wyong Shire Council in accordance with section 306 of the *Water Management Act, 2000*.]

Schedule 4

Statement of reasons why the Tribunal has chosen to set a methodology for fixing a maximum price

Under s13A of the IPART Act the Tribunal may set maximum prices or may determine a methodology for setting maximum prices.

In this determination, the Tribunal has employed a methodology for fixing the maximum prices that each Water Agency may charge for Developer Recycled Water Charges because it would be impractical for the Tribunal to cover the required diversity of Developer Recycled Water Charges by individual price determinations. This is because Developer Recycled Water Charges are levied to recover water infrastructure costs incurred to service a large variety of developments.

Developers include Developer Recycled Water Charges in their planning and investment decisions and require a rapid response when applying for an assessment of charges. If Water Agencies had to return to the Tribunal each time they received an application for an assessment of Developer Recycled Water Charges unworkable delays could result as the Tribunal would have to devote considerable time and resources to mechanically calculating such charges. The Tribunal considers it is preferable that this work be completed by the Water Agencies.

The Tribunal has stressed that Developer Recycled Water Charges must be calculated by a consistent and transparent methodology, and recover efficient costs. This determination will ensure Water Agencies regulated by the Tribunal recover only the efficient costs of the Developer Recycled Water Services. This determination will be applied in a transparent manner, will be tested by Developers and monitored by the Tribunal.

The basic principles underlying the methodology in this determination are that Developer Recycled Water Charges should:

(a) involve full recovery of relevant costs;

(b) reflect variations in the costs of servicing different development areas;

(c) result in new development areas meeting the costs of the Developer Recycled Water Services provided; and

(d) cover only infrastructure expenditures on recycled water assets that can be clearly linked to the development.

Schedule 5

Definitions and Interpretation

1 DEFINITIONS

1.1 General definitions

Asset means an asset (or part of an asset) that directly provides, or will provide, the Developer Recycled Water Services to Developments within a DSP Area for which a Developer Recycled Water Charge is payable.

Avoided Costs means the cost savings to a Water Agency in providing Customer Recycled Water Services to customers within a Development, calculated in accordance with the guidelines published by the Tribunal entitled 'Guidelines for Calculation and Treatment of Recycled Water Avoided Costs' as in force from time to time.

Capital Charge means the Net Present Value of all expenditure on Assets used to service a Development.

Commencement Date means the Commencement Date defined in clause 2 of section 2 (**Application of this determination)**.

Customer Recycled Water Service means the service of supplying treated wastewater for non potable uses by a Water Agency to a customer within a Development.

Developer means a person that establishes a Development.

Developer Recycled Water Charges means the charges paid by a Developer to a Water Agency for a Developer Recycled Water Service and calculated in accordance with clause 2 of schedule 1.

Developer Recycled Water Service means the service of providing a connection between a Developer's Development and the Recycled Water infrastructure of a Water Agency.

Development means a development of land in a Water Agency Area that supports the provision of a Developer Recycled Water Service.

Development Servicing Plan or **DSP** means the development servicing plan defined in clause 9 of schedule 1.

DSP Area means that part of the Water Agency Area covered by a Development Servicing Plan.

Discount Rate means the discount rate specified in schedule 2 for a Water Agency.

Equivalent Tenement means a measure of the demand (determined by a Water Agency) that a Development will place on the infrastructure in terms of the recycled water consumption for an average residential dwelling.

GST means the Goods and Services Tax as defined in *A New Tax System (Goods and Services Tax) Act, 1999*.

Gosford City Council means the Gosford City Council as constituted under the *Local Government Act, 1993* (NSW).

Headworks means significant assets at the end of recycled water systems that provide services to two or more DSP Areas. For example, water headworks may comprise a system of dams, major storage reservoirs, water treatment works and major supply conduits.

Hunter Water Corporation means the Hunter Water Corporation as constituted under the *Hunter Water Act, 1991*.

IPART Act means the *Independent Pricing and Regulatory Tribunal Act 1992.*

MEERA means an asset value calculated on the basis that the Asset is constructed at the time of valuation in accordance with modern engineering practice and the most economically viable technologies, which provides similar utility functions to the existing Asset in service.

Net Present Value or **NPV** means the difference between the Present Value of Operating Revenue and the Present Value of Operating Costs.

Operating Costs means in relation to a DSP Area, the operating, maintenance and administration costs (excluding depreciation and interest) of a Water Agency in providing Customer Recycled Water Services to that DSP Area.

Operating Revenue means the revenues expected to be received by a Water Agency from new customers for Customer Recycled Water Services in a DSP Area.

Periodic Charges means the periodic charges for recycled water services for a Water Agency determined by the Tribunal from time to time.

Pre 2006 Assets means the Assets that were commissioned by a Water Agency before the Commencement Date.

Present Value is the value as at 1 July 2006 of money expected to be received or outlayed in the future. The Present Value can be the present value of a stream of incomes and expenditures. The Present Value is derived from the formula:

$$PV = FV (1 + r)^{-n}$$

Where:
PV = present value;
FV = future value;
r = Discount Rate;
n = number of periods to apply Discount Rate.

Post 2006 Assets means the Assets that:

(a) were commissioned after the Commencement Date but before a Development commenced; or

(b) are commissioned, or are to be commissioned, after a Development commences.

Real Terms means the value of a variable that has been adjusted for changes in the purchasing power of money by a CPI adjustment.

Recycled Water means water that has been treated to enable its use for certain industrial, commercial, and/or household applications, but does not or is not intended to meet the standards for drinking water required by the National Health and Medical Research Council's *Australian Drinking Water Guidelines.*

Sydney Water Corporation means the Sydney Water Corporation as constituted under the *Sydney Water Act*, 1994.

Tribunal means the Independent Pricing and Regulatory Tribunal of New South Wales established under the IPART Act.

Water Agency:

(a) when used in the singular means, each of the following agencies:

(1) Sydney Water Corporation;

(2) Hunter Water Corporation;

(3) Gosford City Council;

(4) Wyong Shire Council; and

(b) when used in the plural means, all of the agencies listed in paragraph (a) above.

Water Agency Area means:

(a) in relation to Sydney Water Corporation or Hunter Water Corporation, its area of operations (as defined in the *Sydney Water Act 1994* or the *Hunter Water Act 1991*, as the case may be); and

(b) in relation to Gosford City Council or Wyong Shire Council, its local government area.

Wyong Shire Council means the Wyong Shire Council as constituted under the *Local Government Act*, 1993 (NSW).

1.2 Consumer Price Index

(a) **CPI** means the consumer price index all groups index number for Sydney, published by the Australian Bureau of Statistics, or if the Australian Bureau of Statistics does not or ceases to publish the index, then CPI will mean an index determined by the Tribunal

(b) $$\textbf{ΔCPI}= \left(\frac{CPI_{Jun,year_t} + CPI_{Sep,year_t} + CPI_{Dec,year_t} + CPI_{Mar,year_{t+1}}}{CPI_{Jun,year_{t-1}} + CPI_{Sep,year_{t-1}} + CPI_{Dec,year_{t-1}} + CPI_{Mar,year_t}} \right) - 1$$

(c) The subtext (for example $CPI_{Jun,year\ t}$) when used in relation to paragraph (b) above means the CPI for the June quarter and year in which the calculation was made and (for example $CPI_{Jun\ year\ t-1}$) means the CPI for the June quarter in the year immediately preceding June,$year_t$.

2. Interpretation

2.1 General provisions

In this determination:

(a) headings are for convenience only and do not affect the interpretation of this determination;

(b) a reference to a schedule, annexure, clause or table is a reference to a schedule, annexure, clause or table to this determination;

(c) words importing the singular include the plural and vice versa;

(d) a reference to a law or statute includes all amendments or replacements of that law or statute;

(e) a reference to a 'year' is a reference to period commencing on 1 July and ending on 30 June in the ensuing calendar year.

2.2 Explanatory notes, examples and clarification notice

(a) Explanatory notes and examples do not form part of this determination, but in the case of uncertainty may be relied on for interpretation purposes.

(b) The Tribunal may publish a clarification notice in the NSW Government Gazette to correct any manifest error in or to clarify any part of this determination as if that clarification notice formed part of this determination.

2.3 Prices exclusive of GST

Prices or charges specified in this determination do not include GST.

Draft Determination No 9, 2006

Section 11(1)
Independent Pricing and Regulatory Tribunal Act 1992

Rouse Hill Recycled Water Charges

Independent Pricing and Regulatory Tribunal
of New South Wales

Reference No: 05/549

D2006/05267

1 Background

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

(2) Sydney Water Corporation (the **Corporation**) is listed as a government agency for the purposes of schedule 1 of the IPART Act. The services of the Corporation declared as monopoly services (**Monopoly Services**) under the *Independent Pricing and Regulatory Tribunal (Water, Sewerage and Drainage Services) Order 1997* **("Order")** are:

(a) water supply services;

(b) sewerage services;

(c) stormwater drainage services;

(d) trade waste services;

(e) services supplied in connection with the provision or upgrading of water supply and sewerage facilities for new developments and, if required, drainage facilities for such developments;

(f) ancillary and miscellaneous customer services for which no alternative supply exists and which relate to the supply of services of a kind referred to in paragraphs (a) to (e);

(g) other water supply, sewerage and drainage services for which no alternative supply exists.

Accordingly, the Tribunal may determine the prices for the Corporation's Monopoly Services.

(3) In investigating and reporting on the pricing of the Corporation's Monopoly Services, the Tribunal has had regard to a broad range of matters, including the criteria set out in section 15(1) of the IPART Act.

(4) In accordance with section 13A of the IPART Act, the Tribunal has fixed a maximum price for the Corporation's Monopoly Services or has established a methodology for fixing the maximum price.

(5) By section 18(2) of the IPART Act, the Corporation may not fix a price below that determined by the Tribunal without the approval of the Treasurer.

2. Application of this determination

(1) This determination fixes the maximum prices (or sets a methodology for fixing the maximum prices) that the Corporation may charge for the Monopoly Services specified in this determination.

(2) This determination commences on the later of 1 October 2006 and the date that it is published in the NSW Government Gazette (**Commencement Date**).

(3) The maximum prices in this determination apply from the Commencement Date to 30 June 2009. The maximum prices in this determination prevailing at 30 June 2009 continue to apply beyond 30 June 2009 until this determination is replaced.

3. Replacement of Determination No. 5 of 2005

Subject to clause 2.4 of schedule 2, this determination replaces Schedule 4 of Determination No. 5 of 2005 from the Commencement Date. The replacement does not affect anything done or omitted to be done, or rights or obligations accrued, under that schedule prior to its replacement.

4. Monitoring

The Tribunal may monitor the performance of the Corporation for the purposes of:

(a) establishing and reporting on the level of compliance by the Corporation with this determination; and

(b) preparing a periodic review of pricing policies in respect of the Monopoly Services supplied by the Corporation.

5. Schedules

Schedule 1 and the Tables in that schedule set out the maximum prices that the Corporation may charge for the Monopoly Services specified in that schedule.

7. Definitions and Interpretation

Definitions and interpretation provisions used in this determination are set out in schedule 2.

Schedule 1

Rouse Hill Development Area

1. Categories for pricing purposes

1.1 This schedule sets the maximum prices that the Corporation may charge the Properties in the Rouse Hill Development Area for services under paragraph (g) of the Order, specifically Recycled Water services.

1.2 The maximum prices in this schedule are in addition to the prices applying to the Properties in the Rouse Hill Development Area under schedules 1, 2, 3, 5, 6 and 7 of Determination No 5, 2005.

2. Categories for pricing purposes

The prices in this schedule have been determined only for Properties in the Rouse Hill Development Area.

3. Charges to Properties in the Rouse Hill Development Area.

The maximum price that may be levied by the Corporation for the provision of Recycled Water and drainage services to the Properties in the Rouse Hill Development Area for a Billing Cycle is the sum of the following:

(a) the Recycled Water usage charge in Table 1 for the Meter Reading Period, corresponding to the applicable Period in that table; and

(b) the Recycled Water service access charge in Table 2, corresponding to the applicable Meter size and Period in that table, divided by the number of quarters in that Period; and

(c) the river management charge (drainage) in Table 3, corresponding to the applicable Period and the relevant land size in that table, divided by the number of quarters in that Period.

Tables 1, 2 and 3

Table 1 Recycled Water usage charge

Charge	Commencement Date to 30 June 2007 ($/kL)	1 July 2007 to 30 June 2008 ($/kL)	1 July 2008 to 30 June 2009 ($/kL)
Recycled Water usage charge)	0.46	0.70 x $(1+\Delta CPI_1)$	1.08 x $(1+\Delta CPI_2)$

Table 2 Recycled Water service access charge

Charge	Commencement Date to 30 June 2007 ($)	1 July 2007 to 30 June 2008 ($)	1 July 2008 to 30 June 2009 ($)
Recycled Water service access charge - Meter size			
20mm	15.54	15.48 x $(1+\Delta CPI_1)$	10.25 x $(1+\Delta CPI_2)$
For Properties with Meter size >20mm the formula to apply is	(nominal diameter)^2 x (charge for 20mm Meter)/400		

[NOTE: The Recycled Water service access charge for the period from the Commencement Date to 30 June 2007 has been adjusted on the basis of a Commencement Date of 1 October 2006 (ie 0.75 of one year)]

Table 3 River management charge (drainage)

Charge	Commencement Date to 30 June 2007 ($)	1 July 2007 to 30 June 2008 ($)	1 July 2008 to 30 June 2009 ($)
River management charge (drainage)			
Non Residential Properties with land size ≤ 1000m^2 and Residential Properties	83.01	110.68 x $(1+\Delta CPI_1)$	110.68 x $(1+\Delta CPI_2)$
Non Residential Properties with land size > 1000m^2	83.01 x ((land area m^2)/1000)	110.68 x ((land area m^2)/1000)x $(1+\Delta CPI_1)$	110.68 x ((land area m^2)/1000) x $(1+\Delta CPI_2)$

Schedule 2

Definitions and Interpretation

1 DEFINITIONS

1.1 General definitions

Billing Cycle means each quarter during a Period.

Commencement Date means the Commencement Date defined in clause 2 of section 2 (**Application of this determination**) of this determination.

Corporation means the Corporation as defined in clause 2 of section 1 (**Background**) of this determination, constituted under the *Sydney Water Act 1994.*

Determination No 5, 2005 means the Tribunal's Determination No 5, 2005 entitled 'Sydney Water Corporation'.

Meter Reading Period means a period equal to the number of days between:

(a) the date on which the Meter was last read (or taken to have been read by the Corporation); and

(b) the date on which the Meter was read (or taken to have been read by the Corporation) immediately preceding the date in paragraph (a).

Monopoly Services means the Monopoly Services defined in clause 2 of section 1 (**Background**) of this determination.

Period means the Commencement Date to 30 June 2007, 1 July 2007 to 30 June 2008 or 1 July 2008 to 30 June 2009 (as the case may be).

Recycled Water means water that has been treated to enable its use for certain industrial, commercial, and/or household applications, but does not or is not intended to meet the standards for drinking water required by the National Health and Medical Research Council's *Australian Drinking Water Guidelines.*

1.2 Incorporated definitions

Words and phrases (other than those defined in clause 1.1 of this schedule) defined in Determination No 5, 2005 have the same meanings in this determination.

1.3 Consumer Price Index

(a) **CPI** means the consumer price index all groups index number for Sydney, published by the Australian Bureau of Statistics, or if the Australian Bureau of Statistics does not or ceases to publish the index, then CPI will mean an index determined by the Tribunal

(b) $\mathbf{\Delta CPI_1} = \left(\frac{CPI_{Jun2006} + CPI_{Sep2006} + CPI_{Dec2006} + CPI_{Mar2007}}{CPI_{Jun2005} + CPI_{Sep2005} + CPI_{Dec2005} + CPI_{Mar2006}} \right) - 1$

$\mathbf{\Delta CPI_2} = \left(\frac{CPI_{Jun2007} + CPI_{Sep2007} + CPI_{Dec2007} + CPI_{Mar2008}}{CPI_{Jun2005} + CPI_{Sep2005} + CPI_{Dec2005} + CPI_{Mar2006}} \right) - 1$

each as calculated by the Tribunal and notified in writing by the Tribunal to the Corporation.

(c) The subtext (for example $CPI_{Jun,year\ n}$) when used in relation to paragraph (b) above means the CPI for the June quarter and year in which the calculation was made and (for example $CPI_{Jun\ year\ n-1}$) means the CPI for the June quarter in the year immediately preceding June,$year_n$.

2. Interpretation

2.1 General provisions

In this determination:

(a) headings are for convenience only and do not affect the interpretation of this determination;

(b) a reference to a schedule, annexure, clause or table is a reference to a schedule, annexure, clause or table to this determination;

(c) words importing the singular include the plural and vice versa;

(d) a reference to a law or statute includes all amendments or replacements of that law or statute.

2.2 Explanatory notes, examples and clarification notice

(a) Explanatory notes and examples do not form part of this determination, but in the case of uncertainty may be relied on for interpretation purposes.

(b) The Tribunal may publish a clarification notice in the NSW Government Gazette to correct any manifest error in or to clarify any part of this determination as if that clarification notice formed part of this determination.

2.3 Prices exclusive of GST

Prices or charges specified in this determination do not include GST.

2.4 Billing

(a) For the avoidance of doubt nothing in this determination affects when the Corporation may issue a bill to a customer for prices or charges under this determination.

(b) If a Meter Reading Period commences before the Commencement Date and ends after the Commencement Date, the Recycled Water usage charge applying to the whole of that Meter Reading Period is the charge calculated under Schedule 4 of Determination No 5 of 2005, prior to that schedule being replaced by this determination.

(c) Subject to clause 2.4(b) above, if a Meter Reading Period traverses more than one Period, the Corporation must levy any charge applying in this determination on a pro-rata basis.

IPART
New South Wales

Independent Pricing and Regulatory Tribunal

Pricing arrangements for recycled water and sewer mining

Sydney Water Corporation, Hunter Water Corporation, Gosford City Council and Wyong Shire Council

Draft Reports Nos 8 and 9, 2006

July 2006

ISBN 1920987 73 8

Request for submissions

Submissions are invited from interested parties. Unless confidentiality is sought, the submissions are generally available for public inspection at the Tribunal's offices and will be available on-line in PDF format from the time of processing of the submission until 3-4 weeks after the release of the final report of an inquiry. The Tribunal may exercise its discretion not to exhibit any submissions based on their length or content (containing material that is defamatory, offensive, or in breach of any law).

Submissions must be made in writing and should be sent to the postal address, fax number or email address below. Where possible, submissions should be provided in a computer readable format (eg, word processor, PDF or spreadsheet) either on disk or by email.

All submissions must be received by 12 noon on 2 August 2006.

Submissions should be sent to: **Recycled Water Price Review**
Independent Pricing and Regulatory Tribunal
PO Box Q290
QVB Post Office NSW 1230

Confidentiality

If you want your submission, or any part of it, to be treated as confidential, please indicate this clearly. The Tribunal may include in its publications a list of submissions received during the course of a particular review or inquiry. It may also refer to submissions in the text of its publications. If you do not want your submission or any part of it to be used in any one of these ways, please indicate this clearly.

A request for access to a confidential submission will be determined in accordance with the *Freedom of Information Act* and *section 22A of the Independent Pricing and Regulatory Tribunal Act*.

Privacy

All submissions will be treated in accordance with the *Privacy and Personal Information Act 1998*. Any personal information you give us will not be reused for another purpose.

Public information about the Tribunal's activities

Information about the role and current activities of the Tribunal, including copies of latest reports and submissions can be found on the Tribunal's web site at www.ipart.nsw.gov.au.

Inquiries regarding this review should be directed to:

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TABLE OF CONTENTS

1 INTRODUCTION AND OVERVIEW

The Independent Pricing and Regulatory Tribunal of NSW (the Tribunal) is investigating pricing arrangements for recycled water services provided by the four metropolitan retail water agencies in NSW – Sydney Water Corporation, Hunter Water Corporation, Gosford City Council and Wyong Shire Council. As part of this investigation, it is also considering pricing arrangements for sewer mining[1] in these agencies' operating areas.

The review is taking place at a critical stage in the evolution of the water industry in NSW. The ongoing and severe drought conditions being experienced, together with population growth, are placing pressure on water supplies in metropolitan areas. As a consequence, the long-term balance between supply and demand for water has become a major concern.

Recycled water has emerged as one of the key strategies for restoring this balance, and a range of initiatives is being implemented to encourage greater use of this resource. As a consequence, the number of recycled water customers is expected to grow significantly over the next 10 years. In addition, many of these new customers will not have a choice about connecting to recycled water for some non-potable purposes.

For these reasons, the Tribunal believes it is both timely and important to consider the pricing of recycled water and sewer mining within the metropolitan region, and to ensure that robust, consistent pricing arrangements are put in place. It is important that, in developing these arrangements, recycled water is not considered as a product in isolation, but as part of an integrated approach to balancing water supply and demand.

The Tribunal has completed the first part of its investigation. The purpose of this report is to explain the Tribunal's draft decisions and determinations, and to seek comment from interested parties to inform the Tribunal's final decision making. (Information on how to make a submission can be found at the front of this report.)

1.1 Overview of Tribunal's draft determinations and decisions

In undertaking its investigation and making its draft decisions, the Tribunal has considered a range of issues related to recycled water and sewer mining. The Tribunal has been mindful that large-scale use of recycled water is in its infancy in NSW, and that information on future capital and operating costs is limited. The Tribunal is also aware that potential users of recycled water themselves have differing degrees of market and negotiating power. These factors have influenced the approaches to price setting adopted by the Tribunal.

The Tribunal has made draft determinations on recycled water developer charges and on recycled water periodic charges for Rouse Hill only. For the remainder of recycled water schemes, the Tribunal has considered recycled water pricing in the context of:

- mandated schemes
- voluntary schemes.

[1] For the purposes of this review sewer mining is defined as "the extraction of raw sewage from a point in the sewerage network upstream of a sewage treatment plant (STP), for treatment and recycling by a party other than the operator of that network".

This distinction reflects the degree of choice that customers have when connecting to recycled water schemes, which influences the relative market power of recycled water suppliers and customers. The Tribunal has developed a draft pricing framework that outlines its preferred pricing arrangements for these customers and for sewer mining. The Tribunal has also made a series of draft decisions to facilitate the implementation of these arrangements, including draft guidelines on the calculation and treatment of avoided or deferred costs associated with recycled water schemes.

The price determinations for recycled water developer charges and recycled water periodic charges for Rouse Hill will be enforceable under the *Independent Pricing and Regulatory Tribunal Act 1992* (the IPART Act). The Tribunal's other draft decisions are not legally binding however the Tribunal has a power under the IPART Act to review agencies' pricing policies.[2] The Tribunal intends to use the pricing framework outlined in this report as a basis for reviewing the water agencies' pricing policies in future.

The following sections provide an overview of the Tribunal's draft decisions and determinations.

1.1.1 Draft pricing decisions for mandated recycled water schemes

'Mandated schemes' are defined as recycled water schemes to which customers are required to connect due to a government policy (such as BASIX or the Metropolitan Water Plan). These schemes will predominantly service residential developments, and the water agency that supplies the water from them will have considerable market power.

Unfortunately, there is little reliable data available to inform the determination of efficient recycled water prices at this time. Given this, the Tribunal considers that pricing guidelines are a more suitable instrument to achieve pricing objectives while allowing the flexibility required within an emerging market. Therefore, rather than determining recycled water prices for mandated schemes, the Tribunal has developed draft pricing guidelines to assist agencies in calculating prices. These guidelines will assist agencies in establishing:

- the maximum cost that should be recovered from a recycled water scheme
- any offsets against this total cost to account for avoided costs or deferred costs,[3] subsidies received, or up-front costs paid by a party other than the water agency or the customer
- the total cost that can be recovered from recycled water customers, and
- how costs should be recovered using different price structures.

The Tribunal will conduct a review of agencies' pricing policies in future using the guidelines as a basis for the review.[4]

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2 *Independent Pricing and Regulatory Tribunal Act 1992*, section 11(1)(b). This is described in more detail in Section 6.9 of this report.

3 Avoided or deferred costs are defined as costs that would have been incurred if the recycled water scheme did not proceed.

4 Section 11(1)(b) of the IPART Act, provides for the Tribunal to conduct "a periodic review of pricing policies in respect of government monopoly services" supplied by a government agency specified in schedule 1 of the IPART Act.

1.1.2 Draft pricing principles for voluntary recycled water customers

'Voluntary customers' are defined as recycled water customers who connect to recycled water schemes at their own discretion. These users have a substitute water product available to them (usually at a regulated price) such as potable water or river water. Because of this, water agencies cannot exercise a high degree of market power over these customers and recycled water is not a monopoly product.

In light of these circumstances, the Tribunal's draft decision is that it will not determine prices for supply of recycled water to voluntary customers. These prices should be negotiated directly between the parties. The Tribunal has suggested some high-level principles to help guide these negotiations.

As the Tribunal will not have a regulatory role in pricing arrangements for these customers, costs and revenues must be ring-fenced from the water agencies' regulated business. However, the Tribunal will review any costs associated with these schemes that water agencies wish to recover from the broader customer base.

1.1.3 Draft determination for recycled water developer charges

The Tribunal has made a draft determination that recycled water developer charges will be set using a methodology based on the methodology for determining potable water and sewerage services developer charges. However, an important difference between these methodologies is that the one for determining recycled water developer charges makes allowance for the inclusion of avoided or deferred costs in pricing arrangements. This will help ensure that costs are shared equitably and that there is no double-counting of costs.

1.1.4 Draft determination for recycled water periodic charges at Rouse Hill

The Tribunal has made a draft determination for recycled water periodic charges at Rouse Hill from 1 October 2006 to 30 June 2009. The Tribunal considers that a price determination is needed for Rouse Hill to transition from the current low usage charge to a price that is consistent with the cost of recycled water. Under the draft determination, the recycled water usage charge will increase in each year of the determination period, so that by 30 June 2009 it will be equal to 80 per cent of the potable water usage charge. The fixed charge will reduce in each year of the price path so that it is $10.25 by the end of the period.[5]

1.1.5 Draft pricing policy for sewer mining agreements

As for mandated recycled water schemes and voluntary recycled water customers, a key consideration when deciding whether to regulate prices for sewer mining is whether the service provider will have market power sufficient to justify regulatory intervention.

In considering its approach to sewer mining, the Tribunal was conscious of the fact that a third party access regime for the water industry is currently being developed.[6] In addition, Sydney Water has developed a sewer mining policy in consultation with stakeholders, including the Tribunal Secretariat.[7] The policy is consistent with the government's work on developing a third party access regime.

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5 Expressed in 2006/07 dollars.

6 NSW Government (2006), *Creating a dynamic and competitive metropolitan water industry.*

7 Sydney Water, *Sewer mining: How to establish a sewer mining operati*on, May 2006.

The principles of the sewer mining policy are that Sydney Water will not charge for the sewage extracted. But to avoid losses, it will recover all costs it incurs to enable the sewer mining connection and its operation. Sydney Water will also recognise any financial savings it receives from the sewer mining operation and offset them against the costs to be recovered from the sewer miner. The policy also proposes that the Tribunal have an arbitration role to settle disputes surrounding sewer mining agreements.

The Tribunal is satisfied sewer miners have significant negotiating power in the market and that the principles in Sydney Water's sewer mining policy provide a sound framework for such negotiations. The Tribunal recommends that Hunter Water, Gosford Council and Wyong Council develop sewer mining policies consistent with the principles in Sydney Water's Policy. In the circumstances, the Tribunal has decided not to make a price determination for sewer mining. Rather, it considers that prices for sewer mining should be negotiated directly between the parties with any disputes to be arbitrated by the Tribunal.

1.1.6 Draft decisions to facilitate implementation of the proposed pricing framework

The Tribunal has developed a series of rules to support its draft pricing decisions. These include:

- that costs and prices of recycled water schemes should be considered as part of an integrated urban water system so that system-wide costs and benefits can be recognised
- to achieve this, water agencies should develop and implement integrated water resource plans to evaluate recycled water projects relative to other water management measures. The Tribunal will use these plans to help it decide whether avoided or deferred costs can be recovered from water or sewerage customers
- costs avoided or deferred by a water agency due to a recycled water scheme should be calculated using the Tribunal's *Guidelines for Calculation and Treatment of Avoided and Deferred Costs of Recycled Water*[8]
- the Tribunal will allow part or all of these avoided costs to be recovered from the broader customer base if agencies can demonstrate that they meet the Tribunal's criteria.

1.2 Structure of the report

The rest of this report explains the Tribunal's draft decisions and determinations in detail:

- Chapter 2 discusses some important contextual issues which have influenced the Tribunal's pricing decisions – including the shift to more integrated approaches to water resource planning, changes to the institutional and regulatory arrangements for the water industry, and the factors that drive decisions to establish individual recycled water schemes
- Chapter 3 explains the broad framework for recycled water pricing that the Tribunal proposes, including overall objectives, linkages with existing water pricing arrangements, and the key principles that underpin its approach to pricing of recycled water and sewer mining

8 See Appendix D for the Guidelines.

- Chapter 4 discusses recycled water as part of an integrated water system, and in this context, establishes the costs to be recovered through recycled water prices and other means, and the mechanisms for doing so
- Chapter 5 discusses the Tribunal's draft determination for recycled water developer charges
- Chapter 6 sets out the Tribunal's draft pricing arrangements where customers are required to connect to a recycled water scheme
- Chapter 7 explains the Tribunal's draft determination for recycled water prices in the Rouse Hill Development Area
- Chapter 8 describes the Tribunal's draft pricing arrangements for recycled water where customers voluntarily connect to a recycled water scheme
- Chapter 9 explains the Tribunal's draft pricing arrangements for sewer mining.

Box 1.1 The Tribunal's review process

As part of this review, the Tribunal released an Issues Paper in February 2006, outlining the key issues related to the pricing of recycled water services and sewer mining provided by the four metropolitan water agencies. It also proposed options for the pricing of these services.

The Tribunal sought submissions from the four agencies and from other interested parties. The submissions received are available on the IPART website (www.ipart.nsw.gov.au).

The Tribunal also held a public hearing in Sydney to discuss issues raised in the Issues Paper and submissions. A transcript of this hearing is also available on the IPART website.

This draft report presents and discusses the Tribunal's draft price determinations and decisions. The Tribunal invites submissions on the draft report and determinations. These submissions are due on 3 August 2006. Details on how to make submissions are provided at the front of this paper. The Tribunal will consider the submissions it receives in preparing its final report and price determinations.

The timetable for the review is provided below.

Table 1.1 Review timetable

Task	Timeframe
Release issues paper	10 February 2006
Receive submissions from water agencies	10 March 2006
Receive public submissions	24 March 2006
Hold public hearing	31 March 2006
Release draft report	13 July 2006
Receive submissions to the draft report	2 August 2006
Release final report	21 September 2006*

* Please note that this date is indicative and may be subject to change.

In making its final determinations and decisions, the Tribunal will be guided by the *Independent Pricing and Regulatory Tribunal Act 1992*. Under this Act, the Tribunal is required, in setting prices for services provided by Government monopoly water suppliers, to consider a broad range of issues, including social, environmental and agency-specific concerns. The Tribunal's consideration of these factors to date is outlined in Appendix A.

In addition, the Tribunal will have regard to the requirements of the National Water Initiative (NWI) endorsed by the Council of Australian Governments.

2 CONTEXT FOR THE REVIEW

The Tribunal is responsible for setting the maximum prices that metropolitan water agencies can charge for all scheduled government monopoly services, under section 11 of the *Independent Pricing and Regulatory Act 1992* (the IPART Act). To date, it has chosen not to determine maximum prices for recycled water services, except for those provided in the Rouse Hill Development Area (a relatively small residential area in Western Sydney). However, recent changes to the way urban water is managed mean that recycled water use will increase significantly in the near future. Therefore, it is timely for the Tribunal to establish robust and consistent pricing arrangements for these services.

Traditionally, the potable urban water supply has been completely and deliberately separated from sewerage treatment and disposal (see Figure 2.1). This 'single use' model for water supply, established to improve public health outcomes, involved building large, rain-dependent water storages, from which water is supplied to urban users via a distribution network. Once used, sewage is transported through a sewerage network, treated to standards required by environmental regulators and discharged to waterways for disposal.

However, in more recent years, growing populations, the increasing costs of tapping new water supplies and greater awareness of the environmental impacts of water extraction and effluent disposal have focused attention on the need to secure long-term supplies of water to meet the needs of growing urban centres in a more sustainable way.

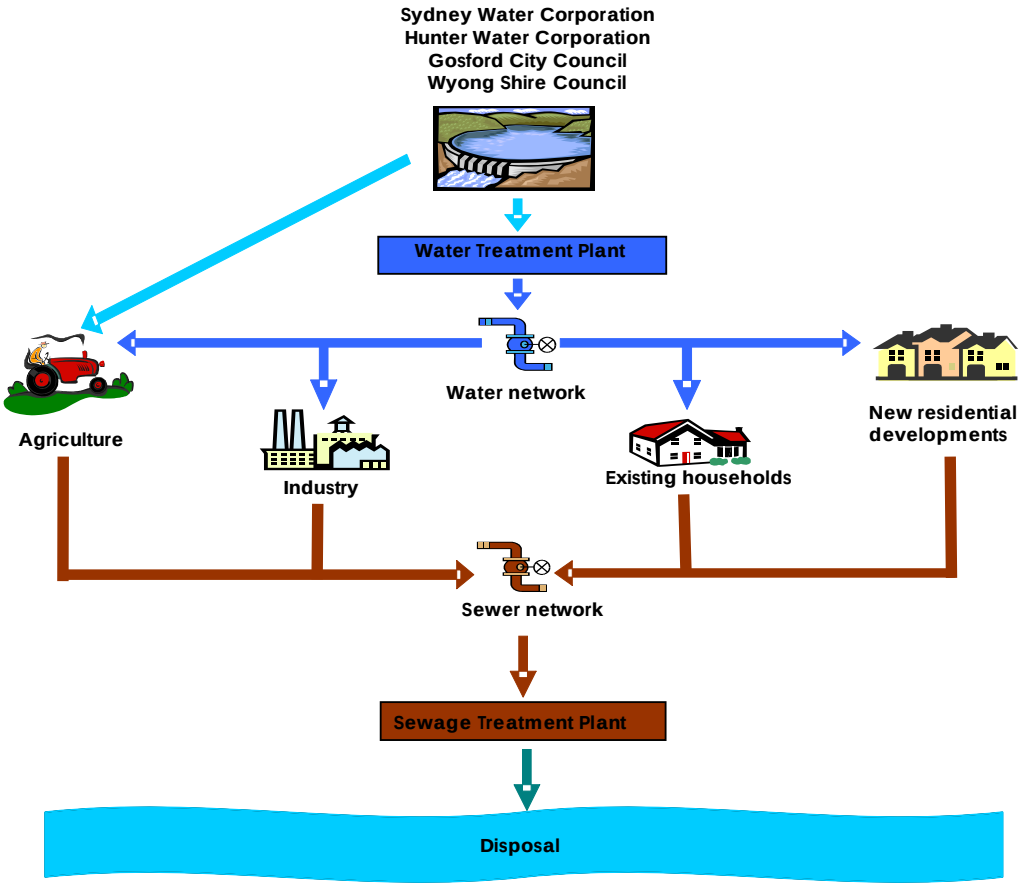

Figure 2.1 The conventional water supply system

In response to this need, the NSW Government and the four metropolitan water agencies are planning and implementing more integrated approaches to meet water demands as populations grow. These approaches use a combination of water efficiency and alternative water supply options to balance supply and demand at the lowest net social cost. At the same time, the Government is reforming the institutional and regulatory arrangements for the water industry, to help encourage private sector involvement in meeting this goal.

Recycled water is an important alternative source of water, so pricing arrangements for recycled water services must be considered in the context of these changes. The following sections discuss the integrated water resource planning approach and ongoing institutional and regulatory reforms in more detail. Subsequent sections explain the factors that can drive decisions to establish individual recycled water schemes, and the current status of recycled water services in each of the four agencies.

2.1 Integrated water resource planning

Integrated water resource planning recognises that no single water supply or water efficiency option will be sufficient to balance supply and demand on its own. Rather, achieving this balance will require a whole suite of options, including water-efficiency options (to conserve water and increase the efficiency of its use) and supply-side options (to increase the available supply of water from various sources). This approach also recognises that people do not necessarily want more water, but rather want the *services* that water provides, such as aesthetically pleasing landscapes, sanitation and clean clothes.[9]

Integrated water resource planning attempts to identify the optimum set and sequencing of options to satisfy the water-related needs of the community at the lowest cost to society and the environment. This involves considering all direct and indirect costs and benefits (including social and environmental impacts) of the range of water management options available, and ranking them according to economic cost.

Greater use of recycled water as a substitute for high-quality drinking water (potable water) for certain uses is one option. It is now widely recognised that effluent is a valuable resource that can be treated and recycled to reduce pressures on the limited potable water supply, rather than simply a waste product to be disposed of. Use of recycled water can also reduce the stress on urban waterways by removing some of the effluent that would otherwise be discharged for disposal. Recycled water is already being used in NSW for agricultural and urban irrigation, industrial processes, and to a lesser degree for residential (non-drinking) uses such as garden watering and toilet flushing (Figure 2.2).

9 The Institute for Sustainable Futures (2003), *The Role of Effluent Reuse In Sustainable Urban Water Systems: Untapped Opportunities*.

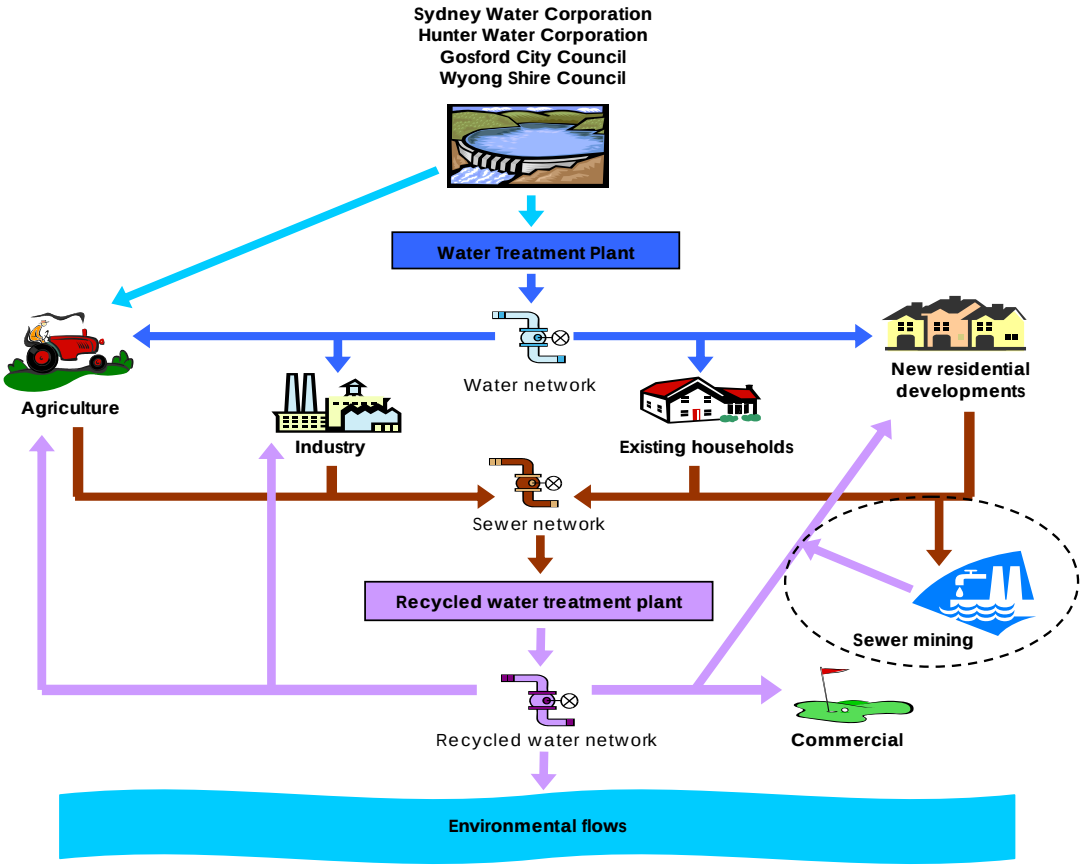

Figure 2.2 Water agencies and potential uses of recycled water included in the review

Plans are being made in the Sydney, Hunter and Central Coast metropolitan areas to increase the use of recycled water where it is economically viable and environmentally sustainable, as part of longer term integrated water resource planning. For example:

- The Metropolitan Water Plan for Sydney includes a recycled water strategy that aims to maximise the use of recycled water to replace potable water where feasible. This strategy identifies projects that will use recycled water for a range of purposes, including residential (non-drinking) purposes. In May 2006, the NSW Government released its new Metropolitan Water Plan, which sets out actions needed over the next 25 years to balance water demands and supplies in Sydney. The plan identified a potential to recycle up to 27,000 megalitres of water each year by 2015.
- Hunter Water is currently reviewing its Integrated Water Resources Plan (IWRP). The review will focus on how recycling can reduce the cost of expanding sewage treatment plants to serve growing populations. It will also consider how recycled water can defer future augmentation of the potable water source and distribution system.[10] Hunter Water is also commencing work on a major recycled water strategy to identify opportunities to increase water recycling over the next 10 years.
- Gosford Council and Wyong Council have developed WaterPlan 2050 to provide a long-term water supply strategy with a view to reducing reliance on surface water sources and establishing a more diverse water supply. Gosford Council is also undertaking a Water Recycling Initiatives study to investigate a wide range of water recycling options in the Gosford Local Government Area. In addition, it is actively pursuing alternative sources of water to replace or supplement potable water.

10 Hunter Water submission, p 2.

2.2 Institutional and regulatory reforms

The NSW Government is undertaking significant reform of the institutional and regulatory arrangements for the water industry. This reform is related to the changes in water supply planning discussed above, and includes the prospect of competition and private sector participation being actively encouraged by the Government.

More specifically, the Government is implementing a range of initiatives that will, among other things, facilitate and encourage greater use of recycled water. These initiatives include:

- the Building and Sustainability Index (BASIX), which currently requires reductions in average water use in new houses and multi-unit dwellings built in NSW, and will be extended to apply to renovations after July 2006
- a streamlined regulatory framework for sewer mining, including a formal dispute resolution process
- a licensing regime for private sector provision of potable water, recycled water and sewerage services to ensure protection of public health and the interests of customers
- a regime to facilitate the negotiation and arbitration of access arrangements to water and sewerage service infrastructure
- streamlined environmental planning and approval requirements for small recycled water plants that discharge to sewerage systems.

The proposed access regime for water and sewerage service infrastructure will provide an enforceable right for entities that wish to supply any type of water service to negotiate 'in good faith' with the owners of existing significant infrastructure to use a service provided by that infrastructure (such as a transportation service). As part of this framework:

- new licensed suppliers will not be subject to price regulation if they are in competition with other suppliers, but the IPART Act will be amended to provide for price regulation if they are supplying services as a monopoly
- all consumers will retain the opportunity to purchase essential water and sewerage services from the incumbent suppliers at postage stamp prices regulated by the Tribunal.[11]

The proposed access regime provides for the Tribunal to arbitrate disputes, including determining appropriate terms, conditions and prices for access to the services, in the event that the negotiations fail. The Tribunal does not currently have the legislative powers to arbitrate such disputes, but changes to the IPART Act are proposed to include this power.

The initiatives listed above are likely to result in an increase in the use of recycled water supplied by both existing water suppliers and new private entrants. Indeed, the overarching objective of these reforms is to "promote competition in the water and sewerage industries, and thereby to encourage new investment and innovation in the metropolitan water industry, in particular in the recycling of water".[12]

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11 Postage stamp pricing means that all customers within each customer class are charged the same price for a service, even though there are variations in the cost of service delivery across the supply network.

12 NSW Metropolitan Water Directorate (2006), *Creating a dynamic and competitive metropolitan water industry*, p 1.

As noted in Chapter 1, the Tribunal's review of recycled water pricing is only considering pricing arrangements for the four metropolitan water agencies for recycled water and sewer mining. However, the Tribunal's draft decisions and determinations establish some key points of reference that may influence the evolution of future private sector involvement. For example, the pricing guidelines for mandated recycled water schemes will establish a benchmark for recycled water prices regardless of who provides these services.

In making its draft decisions and determinations, the Tribunal has been mindful that its decisions about pricing of recycled water and sewer mining could have far-reaching implications for how the industry evolves in the future, and for the incentives for public and private participants to achieve efficient and sustainable water management. Its proposed pricing approach is designed to dovetail with the emerging arrangements for third party access and competition.

2.3 Key drivers of recycled water schemes

While the focus on long-term supply-demand balance and associated institutional and regulatory reforms provide much of the general impetus for greater use of recycled water, the decision to establish a particular recycled water scheme will be driven by one or more specific factors. In some cases, such a scheme might simply be the next lowest cost option for increasing the water supply (for example, relative to a potable water source augmentation). This is particularly likely where likely users are located close to a sewage treatment plant and little distribution infrastructure is required.

In others cases, the decision might be driven by the need to meet various regulatory and other obligations. For example, recycling may enable water agencies to comply with environment protection licence requirements to reduce effluent discharges to waterways. Increasing use of recycled water may also assist water agencies to meet Operating Licence requirements to reduce potable water demand (eg Sydney Water's demand management targets).

Other possible drivers include:

- demand by users to be supplied with recycled water on the basis of cost or product characteristics (eg, greater reliability of supply or suitability for certain industrial processes)
- the need to meet requirements in planning instruments such as the BASIX, which requires reductions in water usage for new houses and renovations
- Government mandates to implement recycling schemes to meet broader public policy objectives.

The variety of drivers of recycled water highlights the differing nature of recycled water schemes. Recycled water is not a homogeneous product. It is suitable for a range of uses, and its costs of supply vary widely, depending on the quality and other characteristics of the recycled water needed, and the distance between the treatment plant and the customer.

Another factor that can influence pricing arrangements for recycled water schemes is whether end-users have access to an alternative source of water. Where they do not, there is greater scope for monopoly pricing by water agencies.

Where decisions to establish recycled water schemes are made as part of an integrated water resource planning approach, these schemes may not only meet demand for water, but also result in lower costs elsewhere in the water and sewerage system. For example, they may enable the water agency to avoid or defer investing in additional treatment capacity to meet environmental discharge requirements. Or, they may give rise to greater external benefits, such as improved environmental outcomes. Thus, there may also be more than one beneficiary from the recycled water. In these situations, determining how costs and benefits should be shared is not straightforward. (This issue is addressed further in Chapter 4.)

2.4 Current status of recycled water for the agencies

The four agencies covered by this review are responsible for providing water, sewerage and some drainage services to almost 5 million people. They service a region that stretches from south of Wollongong to north of Newcastle (see Figure 2.3).[13] While recycled water provision is still in its infancy in NSW, all four water agencies have projects in place or at the planning stage. The current status of recycled water in each agency is outlined below.

Figure 2.1 Approximate area of retail water supply for the four water agencies

[13] For more information on the functions of the water agencies, refer to IPART, *Review of Metropolitan Water Agency Prices Issues Paper*, July 2004. www.ipart.nsw.gov.au/files/DP75.pdf

2.4.1 Sydney Water

Sydney Water currently operates 14 recycled water schemes, which recycle 15,000 megalitres of effluent per year, or 2.8 per cent[14] of the total effluent the agency discharges. These schemes supply water for residential and industrial non-drinking purposes in the Rouse Hill Development Area, for irrigation of golf courses, parks and farms, and for internal reuse within Sydney Water's sewage treatment plants. The Sydney Olympic Park Authority (SOPA) also mines around 600 megalitres of sewage from Sydney Water's system each year, which is recycled for use at Sydney Olympic Park and the nearby suburb of Newington.[15]

Sydney Water expects to increase the volume of water it recycles by an extra 15,000 megalitres a year when additional schemes come on-line in the next few years. These include:

- a scheme to supply Bluescope Steel with 20 megalitres per day of recycled water
- the extension of residential schemes at Hoxton Park and Rouse Hill (stage 3)
- schemes at North Head and Malabar Sewage Treatment Plants for on-site use
- the West Camden agricultural scheme.[16]

In addition, the Government has recently called for expressions of interest from the private sector to provide recycled water services in the Camellia area.

Looking further ahead, Sydney Water expects that the amount of water it recycles will increase to 70,000 megalitres a year by the year 2015 (or around 13 per cent of current available effluent). Much of the increase will come from the Western Sydney Recycled Water Initiative, which is being developed as part of the Metropolitan Water Plan and is expected to produce 27,000 megalitres a year by 2015.[17] The Rouse Hill recycled water scheme is also being expanded to serve an additional 20,000 properties, using over 4,000 megalitres of recycled water, each year by 2028.[18]

2.4.2 Hunter Water

Hunter Water recycles approximately 4,200 megalitres of effluent, or 8.5 per cent of dry weather flows each year.[19] Most of this recycled water is used for industrial purposes (including the Eraring Power Station) and for irrigation of agricultural land, although some is used for irrigation of golf courses and for process water at Hunter Water's sewage treatment plants.

Hunter Water's Integrated Water Resource Plan (IWRP) sets a target to recycled 17 per cent of dry weather effluent flows by 2007. [20] The plan also includes a least one new residential development (Thornton North) that will have both reticulated drinking water and reticulated recycled water.

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14 Water Services Association of Australia (2006), Presentation to IPART's public hearing on the Review of Pricing Arrangements for Recycled Water and Sewer Mining. http://www.ipart.nsw.gov.au

15 Sydney Olympic Park Authority (2005), submission to IPART *Investigation into Water and Wastewater Service Provision in the Greater Sydney Region - Issues Paper,* p 2.

16 NSW Metropolitan Water Directorate (2006), *Metropolitan Water Plan,* p 32.

17 *ibid,* p 30.

18 Data provided by Sydney Water for Rouse Hill price modelling and adjusted by the Tribunal, June 2006.

19 Based on data provided by Hunter Water Corporation for the 2004/05 financial year.

20 Hunter Water Corporation, *Integrated Water Resource Plan,* March 2003. (www.hunterwater.com.au)

2.4.3 Gosford Council

Gosford Council recycles 150 megalitres of effluent each year on-site at its sewage treatment works. It does not currently provide or sell any of this recycled water to external parties. However, it anticipates that two recycled water projects will become operational over the next few years, namely:

- a recycled water tanker filling station
- a sewer mining demonstration project to provide recycled water for irrigation of the Gosford racecourse and nearby playing fields.[21]

As noted above, the Council is also conducting a study to assess the feasibility of a range of other recycled water projects.

2.4.4 Wyong Council

Wyong Council provided around 430 megalitres of tertiary treated recycled water to customers in 2005, and used a small volume of lower quality recycled water on its own sites.[22] The Council currently has two large recycled water customers, both of which are golf courses. It expects that tertiary treatment facilities at other treatment plants will come on line in 2006 to service new recycled water customers.

Wyong Council has also identified long-term opportunities for recycled water in as yet undeveloped urban release areas.

21 Information provided verbally to IPART by Gosford Council.
22 Information provided verbally to IPART by Wyong Council.

3 DEVELOPING A PRICING FRAMEWORK FOR RECYCLED WATER AND SEWER MINING

Given the context outlined in Chapter 2 – particularly the important role that recycled water is likely to play in balancing Sydney's long-term water supply and demand – prices for this resource must be based on sound principles that encourage the optimal mix of supply and demand measures.

To help it develop a robust framework for regulating recycled water, the Tribunal has developed broad pricing principles to underpin its approach. In doing so, the Tribunal:

- identified key objectives for pricing recycled water
- examined recycled water pricing in the context of the existing pricing framework, to ensure consistency with this framework where possible
- considered the principles for recycled water pricing developed elsewhere
- considered the issues that need to be addressed when establishing a framework for recycled water pricing in metropolitan NSW, specifically, the appropriate type and degree of regulation, cost recovery and price structures.

This chapter provides an overview of these considerations and the resulting pricing principles.

3.1 Objectives for recycled water pricing

Taking into account its requirements under the IPART Act, and the context outlined in Chapter 2, the Tribunal considers that the regulation of recycled water prices should achieve six key objectives – economic efficiency; revenue adequacy; transparency and administrative simplicity; equity; competitive neutrality; and compliance with national reforms.

3.1.1 Economic efficiency

Prices of recycled water should ensure that this resource is supplied and used efficiently. There are three types of efficiency that need to be considered:

- *Productive efficiency*, which is achieved when a given output is produced at minimum possible cost, or inputs are minimised for a given output. This type of efficiency relates to the goal of delivering water and sewerage services at the lowest possible cost to consumers.
- *Allocative efficiency,* which is maximised when resources are allocated to achieve the maximum social benefit, taking into account any external costs and benefits associated with their use. This type of efficiency relates to the goal of using the various sources of water in the optimal combination.
- *Dynamic efficiency*, which relates to processes of technological and managerial innovation that increase the ability of suppliers to improve the range, quality and cost of services, increase productivity, and respond to emerging market developments. Removing artificial regulatory barriers to entry to the water supply market may be

important in promoting the investigation and commercialisation of new water sources.[23]

Efficient recycled water prices will help to ensure that water demand and supply are balanced at the lowest long-term net social cost. Arguably, the overriding concern in the current context is to ensure that the pricing arrangements facilitate the adoption of the least-cost, long-term combination of options to balance supply and demand – including optimal investment in the supply of recycled water.

Efficient recycled water prices will also send appropriate signals about the costs of users' consumption decisions once recycled water schemes are in place. Prices that are too high may act as a disincentive for users to utilise recycled water. Prices that are too low may encourage profligate use of the resource.

Finally, efficient recycled water prices should reflect an appropriate allocation of risk between the water agency and users of recycled water services.

3.1.2 Revenue adequacy

In general, the prices of water services provided by a water agency should enable the agency to recover the full costs associated with providing those services where these costs reflect the efficient long-term means of balancing supply and demand while also meeting all other regulatory obligations. At the same time, care needs to be taken to ensure that an agency does not use its market power to charge excessive prices.

Where an agency provides a range of water services, prices need to enable the agency to recover the costs of delivery across services. This issue is particularly pertinent to recycled water services provided as part of an integrated water resource plan. As noted in Chapter 2, recycled water schemes interact with potable water and sewerage services and investments in a way that means they may enable lower costs elsewhere in the system – such as by enabling the agency to avoid or defer investing in additional sewage treatment capacity to meet environmental discharge requirements. Recycled water schemes may also provide broader external benefits, such as better environmental outcomes. Where this is the case, it may be appropriate for the agency to recover at least some of the costs of delivering recycled water services from its whole customer base.

3.1.3 Transparency and administrative simplicity

Pricing arrangements for recycled water services should be simple for water agencies to administer and easy for customers to understand. Complicated pricing systems can increase administration and regulatory costs, and reduce the effectiveness of price signals (and thus encourage inefficient use). In addition, where services are provided by an incumbent water agency with monopoly power, transparent pricing arrangements can increase customers' confidence that the agency is not abusing its monopoly powers.

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[23] IPART, *Investigation into Water and Wastewater Service Provision in the Greater Sydney Region - Issues Paper*, May 2005.

3.1.4 Equity

Water is widely seen as an essential service. The IPART Act also requires the Tribunal to consider the social impacts of its pricing decisions. The pricing and cost recovery arrangements for recycled water schemes should allow for an equitable sharing of the costs of recycled water schemes.

3.1.5 Competitive neutrality

The pricing of recycled water services should ensure consistent treatment of all potential suppliers in the market, whether they are private companies or government-owned water agencies.

3.1.6 Compliance with national water reforms

The National Water Initiative (NWI), which has been endorsed by the Council of Australian Governments, requires:

- the "development of pricing policies for recycled water and stormwater that are congruent with pricing policies for potable water, and stimulate prices of recycled water that fits with potable water pricing"
- pricing policies to "encourage the re-use and recycling of effluent where cost effective."[24]

3.2 The existing framework for pricing water services

The use of recycled water creates a 'feedback loop' to form an integrated urban water system with other water services. Because recycled water is being introduced into an existing system, it is important that the pricing arrangements for this service are consistent with the current approach for pricing water and sewerage services.

An overview of the current pricing framework is shown in Figure 3.1. Under this framework, the Tribunal sets maximum periodic prices for water and sewerage services by:

- establishing each water agency's revenue requirement to efficiently provide water and related services for each year of the determination period, and
- setting maximum prices that take account of this revenue requirement, the demand for water services, and the other matters the Tribunal must consider under Section 15 of the IPART Act.

The Tribunal uses the 'building block' methodology to establish the revenue requirement. This method involves summing estimates of the agency's forecast operating and maintenance expenditure, an allowance for a return on capital (including working capital), and a return of capital (depreciation).[25] It represents the Tribunal's assessment of the agency's efficient level of costs associated with providing regulated water services to the required standards.

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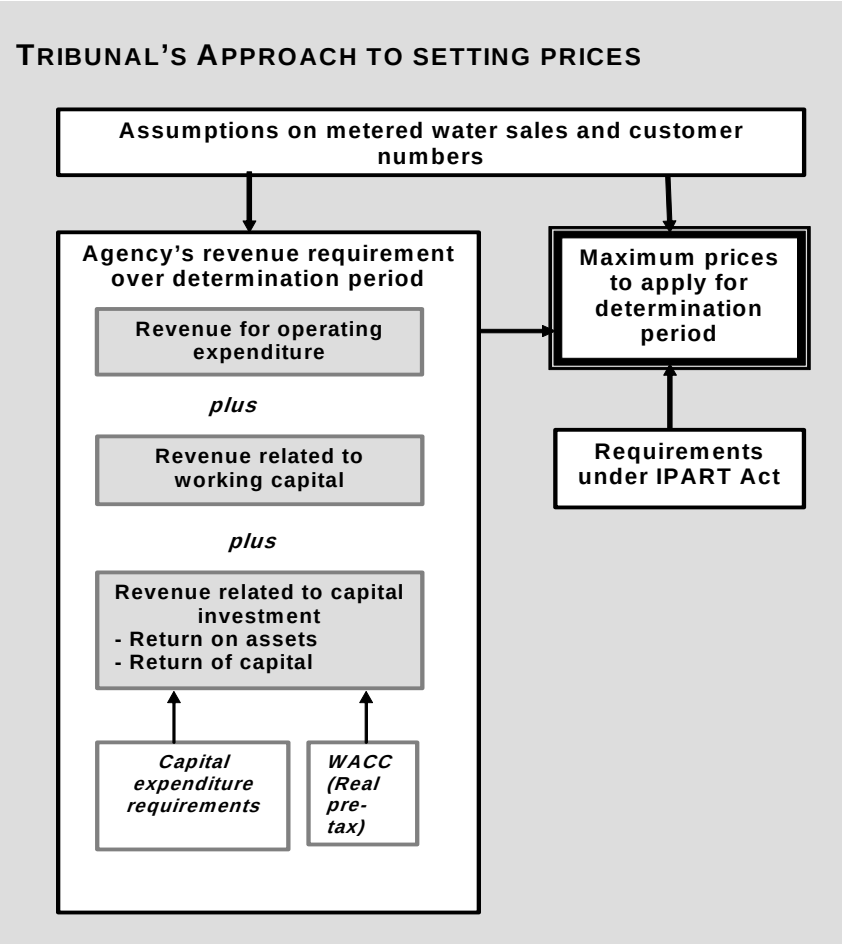
24 *Intergovernmental Agreement On A National Water Initiative* between the Commonwealth of Australia and the Governments of New South Wales, Victoria, Queensland, South Australia, the Australian Capital Territory and the Northern Territory (1994).

25 The building block methodology is the main method used by economic regulators in Australia for determining prices for monopoly services. The building block methodology has been used at each of the metropolitan water reviews conducted by the Tribunal.

Figure 3.1 Tribunal's approach to setting water and sewerage prices



The Tribunal then sets prices designed to generate this level of revenue through a combination of periodic fixed and usage charges. Key features of the pricing structure include:

- uniform or 'postage stamp' pricing for water and sewerage periodic charges in each agency's area of operations
- for sewerage and stormwater services, most of the costs associated with these services are recovered through fixed annual charges
- for water services, a significant portion of the costs is recovered through volumetric usage charges (that is, customers are charged a fee per kilolitre of water they consume) and the remainder is recovered through fixed annual charges
- water usage charges are designed to provide a pricing signal about appropriate levels of water consumption and are set with reference to the Long Run Marginal Cost of water supply
- annual fixed charges for water services are calculated as the residual of revenue requirement not recovered through usage charges or developer charges.

The water agencies also levy a one-off charge on developers to recover infrastructure costs associated with new developments. This charge is set in accordance with a methodology specified by the Tribunal. Under the methodology, developer charges are determined as the difference between the additional revenues expected to be generated by the development (based on ongoing fixed and usage tariffs) and the costs that are deemed to be attributable to the development (all measured in present value terms). They signal to developers and homebuyers the cost of developing and locating in a particular area, and also pass on to developers some of the risk associated with the cost of infrastructure provision.

One of the key principles that underpins the current pricing framework is that prices should fully recover the costs of providing water and sewerage services from the users of these services. This includes full cost recovery from incremental customers (ie, those placing new demand on the system) regardless of whether they are located in new development areas or in redevelopments in existing areas.

A more detailed description of the current pricing framework is provided in Appendix B.

3.3 Principles for recycled water pricing in other jurisdictions

To date, pricing of recycled water in other Australian jurisdictions has been largely undertaken on a project-by-project basis. However, more recently, some attention has been given to the development of a set of principles that takes into account the particular characteristics of recycled water (discussed in section 2.3).

The Water Services Association of Australia (WSAA) released a report in 2005 that included a number of guiding principles for recycled water pricing.[26] The Essential Services Commission also recently released its final decision on the Water Price Review for Victorian water agencies, which requires these agencies to set recycled water prices according to a number of principles.[27] Both these sets of principles are described in Box 3.1.

[26] Water Services Association of Australia (2005) *Pricing for Recycled Water – Occasional Paper no. 12.*

[27] Essential Services Commission (2005), *Water Price Review - Metropolitan and regional businesses' water plans 2005-06 to 2007-08 - Final decision*.

Box 3.1 Recycled water pricing principles developed in other jurisdictions

The WSAA's recycled water pricing principles:

- Prices for recycled water should be set within a price band, with the (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 (ie, just covering system incremental costs) or towards the higher end (where recycled water users make an increasing contribution to joint/common costs).
- Prices for recycled water should be set in a way that broadly tracks the prices of substitutes, but does not lock-in artificially low prices for an unnecessarily long time.
- Prices for recycled water should be set as part of a longer term pricing reform strategy that encompasses the suite of products provided by the water industry (rather than a short-term position based on current charges for potable water and other services).
- Where there are mandated targets for recycled water usage, any subsidies provided to recycled water projects at the expense of the broader (water) customer base should be fully and transparently costed. Preferably, these subsidies should be paid for from general revenue since they constitute a community service obligation (CSO).
- If uneconomic recycled water projects are implemented to meet mandated targets (without CSO funding), it would be appropriate for regulators to accept the costs of mandatory schemes (provided the projects undertaken are the most efficient way of meeting the targets) as a legitimate 'cost of doing business', recoverable from the broad customer base.
- While regulators have a legitimate interest in overseeing prices of recycled water and the efficiency of recycled water schemes, such regulation should be light-handed to provide appropriate flexibility in pricing (e.g. an approach where regulators require adherence to specified principles rather than prescribing specific prices or directly intervening in commercial arrangements), particularly where users have alternative sources of supply or considerable countervailing power as a buyer.
- In some cases, efficient pricing may require different prices for different users, reflecting factors such as the different qualities of recycled water and associated costs of supply (which may vary by user and/or location) and willingness to pay. Failure to allow differential pricing may result in viable recycling projects not proceeding.
- Policies that aim to encourage greater use of recycled water, competition and regulatory reform should be developed by governments and regulators in an integrated fashion.

The Essential Services Commission's principles:

- Revenue should be maximised with reference to the price of substitutes and customers' willingness to pay.
- Prices should cover the full cost of providing the service unless there are identified public benefits or the service is required to meet government targets.
- Prices must include a variable component to provide appropriate signals for resource management.

Where costs associated with providing recycled water are not fully recovered, the ESC's decision requires that water businesses demonstrate that:

- They have assessed the costs and benefits of the recycled water project.
- They have identified how any revenue shortfall will be recovered.
- If the revenue shortfall is to be recovered from customers, there has been consultation about willingness to pay for the benefits of recycled water.

3.4 Issues to be addressed in developing the pricing approach for recycled water in metropolitan NSW

The Tribunal considers that in establishing a framework for the pricing of recycled water that achieves the objectives outlined in section 3.1, it is important to take account of the distinctive characteristics of recycled water services. These characteristics include:

- the nature of the market for different types of recycled water, particularly the degree of market power exercised by suppliers relative to potential users
- the sometimes complex inter-relationships between recycled water and other water and sewerage services provided as part of an integrated system
- the heterogeneous nature and cost of different types of recycled water schemes
- the evolving nature of the market and acceptance of recycled water in the community.

With these characteristics in mind, the Tribunal has considered a range of key issues to establish the major elements of a framework for pricing recycled water services in metropolitan NSW. These issues include:

- Should it regulate recycled water prices at all?
- If so, what form of regulation should it use?
- How should the costs of recycled water schemes be recovered?
- How should it determine what price structures agencies are allowed to adopt in recovering these costs?

3.4.1 Should the Tribunal regulate recycled water prices at all?

The most fundamental issue the Tribunal has considered in this review is whether it should regulate prices of recycled water at all. The rationale for price regulation is the need to address potential concerns about the abuse of monopoly power and/or other market failures. Therefore, a key question is whether recycled water services are provided under conditions of monopoly power.

The answer to this question will vary from scheme to scheme. In some cases, users will be able to choose to receive recycled water services over an alternative water supply option. In these cases, there is not a strong case for price regulation. For example, where industrial users also have access to a potable water supply, or irrigators also have access to low-cost irrigation water, it is not evident that the water agency has substantial market power that it could exploit to the detriment of these users. This is because its ability to exercise this power is limited by the ability of the user to fall back on the alternative supply at a price regulated by the Tribunal. By definition, users will not agree to any supply arrangement that exceeds their willingness to pay.

In other cases, users will have little or no alternative but to connect to a recycled water service (for example, where customers are required to connect to recycled water in new residential developments). In these cases, the supplier may exercise monopoly power and therefore, the Tribunal considers that some form of regulatory oversight is appropriate.

3.4.2 What form of price regulation is appropriate?

Having established that it should have a role in determining recycled water prices at least in some circumstances, the Tribunal considered what form of regulation it should adopt. The appropriate form of regulation will depend on factors such as:

- whether it will result in prices that meet the objectives outlined in section 3.1
- the costs associated with it
- the amount and quality of data available to inform pricing decisions.

The Tribunal identified several possible approaches that may be used to set recycled water prices, including:

- the water agencies negotiating prices directly with customers or developers (i.e. no regulation)
- the Tribunal establishing pricing guidelines, which the water agencies would be encouraged to use to calculate recycled water prices
- the Tribunal specifying a methodology for setting prices, which the water agencies would be required to use to set prices
- the Tribunal setting specific prices, either on a scheme-by-scheme basis, or by setting a 'postage stamp 'price for each agency.

A combination of these approaches is also possible. Indeed, as noted above, the current approach to regulating water and sewerage services involves the Tribunal setting maximum prices for these services, but defining a methodology for setting the developer charges to apply in different geographic areas.

The first two approaches identified above are not enforceable as a price determination under the IPART Act.[28] However, the Tribunal does have power to review the pricing policies of government monopoly service providers. The Tribunal's preferred pricing option will be the one that establishes pricing arrangements that best meet the pricing objectives outlined in section 3.1. Any approach to recycled water pricing will involve trade-offs in achieving these objectives. Advantages and disadvantages of each approach are summarised in Table 3.1.

The Tribunal considers that the appropriate approach to recycled water pricing should vary depending on the specific market and other circumstances for particular types of recycled water schemes. The Tribunal's analysis of the appropriate form of regulation for different types of recycled water schemes is discussed further in Chapters 5 - 8.

[28] Under section 11 of the IPART Act, the Tribunal may set maximum prices or may determine a methodology for calculating maximum prices. Section 11(1)(b) of the IPART Act provides for the Tribunal to review pricing policies of government monopoly services.

Table 3.1 Advantages and disadvantages of alternative approaches to pricing recycled water

Form of Regulation	Advantages	Disadvantages	Comment
Agencies set prices in negotiation with users	▪ Avoids need for the Tribunal to analyse individual recycled water schemes ▪ Facilitates pricing structures reflecting costs and risks of individual schemes ▪ Avoids risk of Tribunal setting a price that exceeds users' 'willingness to pay'	▪ May not provide sufficient protection for customers where market power exists ▪ Equity issues may arise due to inconsistencies and a lack of transparency in pricing practices between agencies ▪ Once prices are in place, it is difficult to adjust them	▪ Only appropriate in situations where recycled water customers have sufficient market power to negotiate prices directly with suppliers
Tribunal sets prices for each scheme or sets a postage stamp price for each agency	▪ Provides greater protection and certainty for users by setting specific & enforceable maximum prices ▪ Administrative simplicity for both the water agencies and users	▪ Requires Tribunal to analyse individual recycled water schemes ▪ Significant regulatory costs for agencies ▪ If there is inadequate information on costs and demands may result in inefficient prices	▪ More appropriate where standard services are provided under conditions of monopoly power
Tribunal sets a methodology to be applied by agencies	▪ Avoids need for the Tribunal to analyse individual recycled water schemes ▪ Facilitates pricing structures reflecting costs and risks of individual schemes ▪ Avoids risk of Tribunal setting a price that exceeds users' 'willingness to pay'	▪ May necessitate greater Tribunal involvement in monitoring compliance with the specified methodology ▪ If there is inadequate information on costs and demands, may result in inefficient prices	▪ More appropriate where there is concern about market power of suppliers, but a desire to allow flexibility to accommodate different circumstances
Tribunal specifies guidelines for the agencies to follow	▪ Avoids need for the Tribunal to analyse individual recycled water schemes ▪ Facilitates pricing structures reflecting costs and risks of individual schemes ▪ Avoids risk of Tribunal setting a price that exceeds users' 'willingness to pay'	▪ Not legally enforceable so may allow scope for agencies to exercise monopoly power ▪ May result in less consistent pricing approaches between agencies	▪ Allows more flexibility to accommodate different circumstances ▪ The Tribunal can use the guidelines as a basis for a review of pricing policies

3.4.3 How should the costs of recycled water schemes be recovered?

Regardless of the level and type of price regulation of recycled water, prices must enable the water agencies to recover the efficient costs of providing services. In addition, economic principles suggest that where a firm supplies a number of services, the prices for each service should be set in a way that enables the total costs of delivering all services to be recovered while also ensuring that no individual service is subsidised by the others.

This implies that prices should recover at least the costs of providing the service and recover no more than the stand-alone (total direct) cost of the scheme.[29] For most services, the incremental costs of supplying users of those services are appropriately attributable to them under a 'user pays' principle. This principle is reflected, for example, in the current developer charges methodology (outlined above). On this basis, the starting point for pricing of recycled water would be that the direct incremental costs of each recycled water scheme should be recovered from users of that scheme.

However, recycled water services interact with potable water and sewerage services and investments in a way that means that the benefits of a recycled water scheme may extend beyond the direct users of recycled water. As noted in Chapter 2, a recycled water scheme may enable costs to be avoided or deferred elsewhere in the system or generate broader community benefits.

Under these circumstances, it is appropriate for at least some of the costs of recycled water schemes to be recovered from parties other than direct users of the service. This may involve recovering costs from either the broader customer base or by way of direct government funding via a CSO. The Tribunal's proposed approach for recovering costs of specific recycled water schemes from the range of beneficiaries is discussed in Chapter 4.

3.4.4 What price structures should be used?

Once the level of costs to be recovered from recycled water users is established, the pricing framework needs to identify the structure of the prices for recovering this level of revenue. As noted above, three types of charges are used to recover the costs associated with other water services – periodic fixed and volumetric usage charges, and up-front developer charges.

Price structures for recycled water prices should allow costs to be recovered while also achieving (as far as possible) economic efficiency (including the appropriate allocation of risk), equity, and other objectives identified in section 3.1 above. The Tribunal has considered the role of different price structures in recycled water pricing, and the extent to which it should prescribe the use of each type of charge or leave this to the water agencies to determine. The functions of each component of price structure are discussed below.

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[29] More formally, the so-called Baumol conditions for pricing of services, including the allocation of the joint/common costs inherent in networks where there are economies of scale and scope, state that: no price, or set of prices, should exceed the stand-alone costs (SAC) of providing the service or services, where stand-alone costs are determined as the costs that an efficient competitor would incur in providing just that service or group of services; and that no price, or set of prices, should be less than the incremental (or avoidable) costs of providing the service or services, where incremental costs are the additional costs incurred by the monopolist in providing just that service or group of services. They are designed to mimic the constraints placed on firms by contestable markets. For further discussion see Water Services Association of Australia (2005), Pricing for Recycled Water – Occasional Paper no. 12.

Usage charges

In general, usage charges should send signals to enable consumers to make decisions about how much to consume. Economic theory suggests that usage prices should be set at the long run marginal cost (LRMC) of providing the service to achieve efficiency. The LRMC represents the incremental cost of measures to bring the demand and supply of water into balance

In practice, determining and setting recycled water prices strictly on the basis of the LRMC of individual recycled water schemes may not be the most efficient price in a whole-of-system context. If a recycled water scheme is part of the least-cost water supply solution, the relevant price will be equal to the LRMC of water (including all sources).

For recycled water, the level of the usage charge will usually be capped at the price of the alternative options available to users (ie, the price of potable water or river water). In some cases, customers may be willing to pay more than the price of the alternative if there are other benefits such as greater reliability of supply. Conversely, if there is a perception that recycled water is of lower quality than the alternative source, customers may expect a discount for recycled water.

The efficiency implications of departing from strict LRMC pricing are unlikely to be great when demand is inelastic. Perhaps the most important consideration is to ensure that usage charges are not set above the price of alternatives (which might encourage illegal cross-connections) or are set too low (which might encourage profligate use).

Fixed charges

Annual fixed charges can be used to recover fixed operating costs of providing recycled water services (eg, monitoring or administration) and/or contribute to the recovery of any capital costs not recovered through developer charges.

Given that the usage price of potable water is likely to place a ceiling on the usage charge for recycled water, a fixed charge may be necessary to help recover specific scheme costs in existing areas (ie, where no developer charges apply) or additional scheme costs (eg renewal of assets) that arise during the life of the scheme.

It will be important that recycled water fixed charges are not set at a level that might motivate customers to disconnect from the recycled water system.

Developer and other up-front charges

Consistent with the current pricing framework for water and sewerage, developer charges for recycled water should be set to recover the difference between the costs of the scheme net of subsidies and avoided costs, and the periodic revenues to be generated over time, from periodic usage and fixed charges.

Developer or other up-front charges may also play an important role in mitigating the risk of stranded assets where water agencies invest in user-specific recycled water assets and users cease taking recycled water at some point in the future.

3.5 The Tribunal's key principles for pricing recycled water

Taking into account the range of matters discussed above, the Tribunal has identified five key principles that it believes should underpin its approach to regulating prices for recycled water services. These principles are:

1. The Tribunal should regulate prices for recycled water services and sewer mining only if there is an opportunity for water agencies to exercise monopoly power and it is confident that price regulation would improve economic efficiency.
2. Pricing arrangements should reflect the specific market and other characteristics of recycled water and sewer mining schemes.
3. Pricing arrangements for recycled water and sewer mining must be consistent with maintaining the current framework for water and sewerage pricing.
4. Pricing arrangements for recycled water should reflect the fact that the services form part of an integrated urban water system.
5. Recycled prices should recover the full direct cost of implementing the recycled water scheme concerned *unless*:
   - the scheme gives rise to avoided costs that benefit the water agencies and users other than the direct users of the recycled water, and/or
   - the scheme gives rise to broader external benefits for which external funding is received or for which government has mandated that other users should pay, and/or
   - the Government formally directs the Tribunal to allow a portion of recycled water costs to be passed on to a water agency's broader customer base.
6. The structure of prices should ensure that appropriate signals are sent to recycled water users and should entail appropriate allocation of risk.

Chapters 4 to 8 explain in detail how the Tribunal has applied these principles in its proposed approach for regulating the prices of recycled water services and sewer mining.

4 RECOVERING THE COSTS OF RECYCLED WATER

One of the key steps in pricing water services is determining the level of costs to be recovered and deciding how those costs should be allocated through pricing arrangements. As Chapter 3 explained, the prices of recycled water services should enable water agencies to recover the full efficient costs of providing these services.

While the Tribunal believes the approach for recovering the costs of recycled water services should be consistent with the current approach for water and sewerage services, there will need to be some key differences. Introducing recycled water schemes into the existing water and sewerage system represents a departure from the traditional single-use model for water supply. Recycled water schemes can meet multiple objectives within an integrated urban water system.[30] Therefore, recovering the costs of providing recycled water schemes must be considered in the context of the system-wide outcomes they achieve.

This will have implications for both the selection of schemes for implementation, and the way the costs associated with these schemes are recovered. The Tribunal's proposed approach for recovering the costs of recycled water schemes in an integrated urban water system includes the following key steps:

- establishing an integrated water resource planning framework to facilitate a system-wide approach to investment in water supply and water efficiency measures
- determining the direct costs that must be recovered from a recycled water or sewer mining scheme to ensure adequate revenues for water agencies
- determining whether these direct costs should be shared between users and other parties, based on the drivers and benefits of the scheme (including direct user benefits, benefits received elsewhere in the system and external benefits)
- calculating the costs to be recovered from users of the scheme and from other parties (including costs deferred or avoided in the water and sewerage systems as a result of recycled water schemes)
- selecting the appropriate mechanism for recovering these costs.

Each of these steps is discussed below.

4.1 Establishing an integrated water resource planning framework

When setting prices to recover the costs of recycled water and sewer mining services, it is important to consider these costs in a system-wide context. As Chapter 2 discussed, using recycled water can achieve multiple objectives associated with supplying water and managing the environmental impacts of effluent disposal, and can result in benefits for a range of stakeholders. For example:

- The use of recycled water can lead to savings elsewhere in water and sewerage system. Where recycled water is used as a substitute for potable water, it may defer or avoid the need to augment the water supply and distribution network (dams etc) or increase the reliability of supply for other users (eg less restrictions). Similarly, where effluent is

[30] For example, a recycled water scheme may replace potable water use in a supply-constrained system while simultaneously meeting environmental requirements by reducing effluent discharges to waterways.

treated and used as recycled water rather than discharged to the environment, it may defer or avoid the need for additional investment in treatment plants to comply with environmental licence obligations.

- The use of recycled water and sewer mining can achieve broader community benefits, such as environmental improvements, and improved visual amenity.[31]

In addition, some of the costs associated with providing recycled water services are not new costs – that is, they would be incurred anyway in providing other water-related services. In particular, some of the costs of treating recycled water would be incurred to treat and dispose of effluent (ie, at least the costs of treating it to the standard required for discharge to the environment).

Given the above, it will be necessary for water agencies to assess the costs and benefits of recycled water projects in a system-wide context. When making decisions about whether to proceed with a specific recycled water or sewer mining project, the agencies will also need to compare it against alternative measures that could be used to achieve the same outcomes.[32]

To ensure that this occurs, the Tribunal has made a draft decision to require the water agencies to develop integrated water resource plans (IWRPs) if they intend to seek to recover costs from parties other than users of a particular recycled water scheme. Integrated water resource planning is the process of developing the least-cost suite of options to balance water demand and supply. Developing an IWRP involves:

- calculating the 'levelised cost'[33] of each water-efficiency and supply-side option to give a cost per kilolitre for the option
- ranking options based on their 'levelised costs', to determine the order of implementation
- sequencing the implementation of projects to balance supply and demand over time.

The Tribunal believes the water agencies should assess all potential recycled water schemes according to the IWRP process and, if they are viable, include these schemes in their capital program. The agencies should also use IWRPs to determine their system-wide costs 'with' and 'without' a particular recycled water or sewer mining scheme, which is important for calculating the avoided or deferred costs associated with that scheme (discussed further in section 4.4 below).

Hunter Water is already required to develop an IWRP as a condition of its Operating Licence. For the other water agencies, developing an IWRP will not be a regulatory requirement at this stage. However, they will need to develop such a plan if they wish to have the Tribunal assess whether they can recover the avoided or deferred costs associated with recycled water schemes from their water or sewerage customer base. When making these assessments, the Tribunal does not propose to verify the specific options contained in

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31 Some of these benefits may be difficult to quantify. However, it is important to recognise their existence when evaluating the costs and benefits of projects.

32 For example, a recycled water scheme may be one option for meeting water demand, but may also reduce effluent discharges to waterways, thus helping to achieve environmental licence requirements. It is important that both these outcomes are recognised when evaluating the costs and benefits of the project.

33 The levelised cost is the net total cost of an option (including any environmental and social costs or benefits) divided by the volume of water saved or supplied by the option, all measured in present value terms.

the IWRP – rather, the onus will be on the water agencies to demonstrate that options are part of the least-cost suite of options.

The Tribunal believes agencies should develop their IWRPs in consultation with stakeholders and publish these plans. This will help to develop stakeholder confidence that the selected water supply and water-efficiency options are the least-cost suite of options.

The Tribunal recognises that long-term water resource planning is characterised by uncertainties associated with the probability of rainfall, the impacts of climate change, and other factors outside the water agencies' control. The Tribunal will take this into account when assessing the efficiency and prudence of water supply expenditure for inclusion in water prices.

4.2 Determining the direct costs to be recovered

The direct costs associated with recycled water schemes can vary widely, and depend on the nature of the scheme, its location, and the quality of the recycled water needed for specific end-uses. However, broadly speaking, these costs can be grouped into capital, operating and administration costs:

- Capital costs include the costs of constructing additional treatment plants, trunk mains and reticulation systems and storage capacity. Capital costs also include costs incurred by customers to access the recycled water, such as conversion of equipment, plumbing, and on-site treatment.
- Operating costs include the annual costs incurred in maintaining and operating the recycled water system, as well as any additional treatment and disposal costs incurred after the recycled water has been used. Operating costs also include ongoing monitoring and compliance with regulatory requirements and, in some cases, costs associated with potable water top-up to match seasonal variation in demand and supply.
- In addition, operating costs include administration costs, such as marketing, education and consultation programs, legal costs, and metering, billing and other customer related costs.

In a combined water, sewerage, stormwater and recycled water business, there are also a number of joint costs. These joint costs are currently allocated between water, sewerage and stormwater services. This will remain the case while recycled water continues to represent a small part of the overall water supply. However, as the use of recycled water grows, a share of these joint costs may need to be allocated to recycled water services.

While the direct costs of recycled water vary considerably from scheme to scheme, the direct per unit cost of recycled water is typically higher than the current usage charge for potable water, particularly for dual reticulation systems. There are several reasons for this:

- Building recycled water schemes in new development areas involves constructing an additional pipe system to distribute the recycled water. This represents a significant proportion of the cost of supplying the service.
- Costs of supplying potable water are not fully reflected in the usage charge. Some costs are recovered through fixed charges and through developer charges in new developments. This will also be the case for some recycled water schemes.

- The direct costs do not reflect avoided costs or external benefits associated with recycled water schemes. Some schemes will only become economic when recycled water is evaluated in the context of an integrated urban water system, and the value of these avoided costs or external benefits are taken into account.
- Although the potable water usage charge is set with reference to the long run marginal cost of water supply, the LRMC is calculated based on a 'bundle' of options to balance demand and supply. The costs of a suite of supply and demand side measures are averaged to arrive at an estimate of the LRMC. This means that some measures (such as installing water efficient showerheads) will be cheap and others (such as developing recycled water schemes) will be more expensive than the LRMC. Table 4.1 illustrates the potable water saved or supplied and the approximate unit costs of various measures included in the Metropolitan Water Plan.[34]

Table 4.1 Water saved or supplied and unit costs of water management measures

Options	Water saved or supplied by 2015 (GL/a)	Approx. unit costs (c/kL)
Residential indoor - retrofits and rebates	12	50 - 60
Residential outdoor (excluding raintanks)	22	10 – 20
Raintank rebates - residential and schools	2	300
Non-residential[1]	36	30 – 50
Pressure and leakage reduction	30	20
Western Sydney Recycled Water Initiative[2]	2	580
Committed/approved recycling schemes[2,3]	28	100 – 300
BASIX	23	30 – 400
Appliance standards and labelling	15	4 - 5

1 Excludes programs in schools and enhanced NSW Government efficiency
2 Figures nett of BASIX requirements to avoid double counting
3 Excludes existing recycling

4.3 Determining how direct costs should be shared between users and other parties, based on scheme drivers and benefits

Provided that the direct costs of a recycled water scheme are 'efficient' and form part of the least-cost suite of options to balance water supply with demands, the pricing arrangements should permit a water agency to recover these costs by one means or another. Therefore, in line with the current pricing framework for water and sewerage services, the Tribunal proposes that, as the 'starting point', the direct incremental costs of recycled water schemes should be recovered from the users of those schemes.

34 White, S. and Campbell, D. et al (2006) Review *of the Metropolitan Water Plan – Final Report*, p 87.

However, the Tribunal recognises that there is a range of drivers for individual recycled water schemes, which means that there may be a divergence between the users and the beneficiaries of a particular scheme. For example, as Chapter 2 discussed, these drivers may include one or a combination of the following:

- users' demand for recycled water on the basis of cost and/or product characteristics (eg, greater reliability of supply or suitability for certain industrial processes)
- the need for recycled water in new developments to meet requirements in planning instruments such as the BASIX, which requires a 40 per cent reduction in water usage
- agencies' need to meet environment protection licence requirements relating to effluent discharges to waterways – for example, recycled water may be the least cost means of meeting specified obligations
- agencies' need to meet operating licence requirements to reduce potable water demand, such as Sydney Water's demand management targets
- Government mandates to implement recycling schemes to meet broader public policy objectives.

If costs are not allocated appropriately between the users of a recycled water scheme and the beneficiaries of any cost savings in other parts of the system or of any external benefits, schemes may not proceed because recycled water prices will need to be set at a level that exceeds customers' willingness to pay. Where these projects represent part of the least-cost water supply solution, this will result in an economically inefficient outcome.

Given the above, the Tribunal believes that the direct costs of recycled water schemes should be recovered on a scheme-by-scheme basis, and should be recovered from users of the scheme or from users and other beneficiaries, based on the drivers and benefits of the scheme. The Tribunal notes that the ESC has expressed a similar view.[35] In addition, the Total Environment Centre argued in its submission to this review that:

> Recycled water schemes must be viewed as a component of overall water and wastewater systems. In this respect it may be appropriate for some of the costs of recycled water to be incorporated into potable water and sewerage prices.[36]

The drivers and benefits of recycled water schemes – including user demand, system-wide benefits, and external benefits – and their implications for how costs should be allocated to users and other beneficiaries are discussed below.

4.3.1 User demand

To the extent that recycled water users are the sole beneficiaries of a recycled water scheme, the 'user pays' principle suggests that the direct incremental costs of each recycled water scheme should be recovered from users of that scheme.

For schemes that are purely 'demand-driven' (ie, 'discretionary' schemes sought by users), the Tribunal proposes that the direct incremental costs of each recycled water scheme be recovered from users of that scheme (as discussed in Chapter 5).

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35 Essential Services Commission (2005), *Water Price Review, Metropolitan And Regional Businesses' Water Plans – Draft Decision.*

36 Total Environment Centre (2006), submission to IPART's review of pricing arrangements for recycled water and sewer mining, p 3.

4.3.2 System-wide costs

Where a recycled water scheme is part of the overall least-cost means of meeting long-term supply and other obligations, some costs can legitimately be shared across the system as a whole. For example, expenditure on a recycled water scheme may lead to benefits in the form of avoided or deferred costs elsewhere in the system (ie, costs that would, in the absence of the recycled water scheme, otherwise be incurred by water or sewerage customers). Possible 'avoided costs' include:

- Current system operation and maintenance savings. These might include reductions in pumping and disposal costs associated with the sewage that would otherwise have been processed by the existing system (although these are likely to be minimal). 'Licence compliance savings' might also be achieved if a recycled water project reduced load based licence costs.
- Future system capacity savings due to deferment of capital infrastructure upgrades or system augmentations in the water or sewerage networks to meet growth and/or compliance with obligations (such as environmental discharge requirements).

If this is the case, the recycled water scheme is potentially benefiting both its direct users and other water and sewerage users. Therefore, there is a case on both equity and efficiency grounds that both these groups should contribute to the costs of the scheme.

This issue is particularly important where high direct costs mean that a scheme may not proceed unless some or all of the avoided costs (which may have underpinned the original business case) are taken into account in calculating the costs to be recovered from the direct users of that scheme. Box 4.1 provides a simple example that illustrates this issue.

Box 4.1 Illustration of cost sharing arrangements

To meet higher environmental licence requirements, a water agency will have to invest $5 million in upgrading its sewage treatment plant. Assuming the Tribunal deems this capital expenditure to be prudent and efficient, the full cost would be passed on to customers in sewerage charges.

Alternatively, the agency could treat effluent from its sewage treatment plant and sell the resulting recycled water to agricultural users. This will require it to invest $3 million in treatment and delivery systems. However, the irrigators are only willing to pay $1 million for the product, because they can buy an alternative product for a relatively low cost.

If the agency seeks to recover all of the costs of the recycled water scheme ($3m) from agricultural users, they will not be prepared to pay and the scheme will not go ahead, thereby necessitating the higher $5 million investment.

But if the shortfall of $2 million is recovered from sewerage customers, recognising the benefit to them of avoiding the more expensive sewage treatment plant upgrade, the scheme will go ahead as the least cost means of meeting the overall system requirements.

Given the above, the Tribunal considers that the costs of a recycled water scheme should be allocated between direct users and other water and sewerage users based on the extent to which these other users benefit from system-wide benefits generated by the recycled water scheme. This extent should be measured by calculating the level of avoided costs associated with the scheme – that is, the costs that other water and sewerage users *would have borne* if the recycled water scheme had not been implemented. The corollary of this is that where costs are avoided due to a recycled water scheme, recycled water users should pay only the incremental system-wide cost.

Therefore, the Tribunal proposes that the total costs of a recycled water scheme should be shared between the direct users of the recycled water and other water or sewerage customers, and the contribution of the latter should be based on the amount of avoided or deferred costs generated by the scheme. The Tribunal's proposed methodology for calculating avoided/deferred costs is discussed in section 4.4 below.

4.3.3 External benefits

In other cases, recycled water schemes may not be commercially viable from the water agency's point of view, but may result in other community or environmental benefits beyond the water agency and its customers.

In principle, the value of these external benefits should be met directly by the Government, for example through a CSO payment. If the Government does provide funding in this way, the value of the payment received should be deducted from the costs of the scheme to be recovered from customers of the water agency.

If the Government does not provide funding via a CSO but explicitly mandates a scheme that is uneconomic, the Tribunal will only allow the agency to recover the revenue shortfall from the broader water and sewerage customer base if there is an explicit directive from Government to do so.

4.4 Calculating the costs that can be recovered from users and other parties

If the costs of a recycled water scheme are to be shared between the direct users of the scheme and other parties, the next step is to calculate the level of costs that can be recovered from each group. The Tribunal proposes that the total costs that can be recovered from the direct users is the sum of the capital costs, operating costs and joint costs of the scheme, minus the 'cost offset' amount that can be recovered from other beneficiaries (the broad water and sewerage customer base) or parties (including the Government and developers). This 'cost offset' amount will include the following elements:

- direct Government funding to help pay for the scheme
- the value of developer-funded recycled water assets
- any amount required by Government directive to be recovered from parties other than recycled water users
- the value of avoided or deferred costs in water and sewerage systems due to the recycled water scheme.

Calculating the value of the first three of these elements is fairly straightforward, as their value should be explicit. However, calculating the value of avoided and deferred costs in the water and sewerage systems is more complex, because in some cases, these costs would be incurred at a future date – perhaps 10 or more years away. Thus, the avoided or deferred costs are not reflected in current water and sewerage prices. This means that if recycled water costs and prices are reduced to reflect avoided or deferred costs, agencies will not recover sufficient revenue.

To assist water agencies in allocating avoided or deferred costs to parties other than recycled water customers, the Tribunal has developed some principles and guidelines for their calculation and treatment. The Tribunal proposes that it will only allow water agencies to recover avoided or deferred costs resulting from recycled water schemes through the prices of other water services if the agencies can demonstrate to the Tribunal's satisfaction at the next water and sewerage price review that the costs:

- will actually be avoided or deferred
- are efficient
- have been estimated according to the Tribunal's guidelines for calculating avoided or deferred costs.

The Tribunal believes it is important that the avoided costs of recycled water schemes are not overstated and transferred to the broad customer base unless justified. Avoided costs should only be transferred to parties other than direct users of recycled water to the extent that it leaves those parties no worse off than they would have been without the recycling scheme.

Therefore, avoided costs should be determined by establishing the total costs of meeting demand and how they would be borne both 'with' and 'without' the recycled water scheme. This requires that both incremental costs and incremental revenues (or revenue foregone) be considered under the recycled scheme and under the alternative scenario.

Appendix C contains the Tribunal's draft *Guidelines for the Calculation and Treatment of Avoided and Deferred Costs of Recycled Water,* and includes some illustrative examples of such calculations. The Tribunal anticipates that much of the information required for calculating avoided or deferred costs will be readily available from the IWRP process used to determine the least-cost suite of options.

4.5 Determining the appropriate mechanisms for recovering costs

Once the total level of costs to be recovered for the recycled water scheme is established, the final step is to determine an appropriate and transparent mechanism for recovering these costs from each group. The Tribunal believes that this mechanism needs to:

- ensure that prices for the various services reflect the appropriate cost allocation discussed in section 4.4
- take account of timing differences between the incurrence of costs on a recycled water scheme and the realisation of avoided or deferred costs elsewhere in the system.

If a recycled water scheme avoids or defers *growth-related* capital expenditure (ie, expenditure that would have been needed to accommodate new development), it is appropriate for the costs of that scheme to be recovered from recycled water users through periodic charges, and through up-front developer charges for water or sewerage infrastructure (depending on whether the avoided expenditure would have been water or sewerage-related).

If a recycled water scheme results in avoided capital expenditure that is *not* growth-related, it is appropriate for the costs to be recovered from recycled water users through periodic charges, and from other water and/or sewerage users (who would otherwise have been required to pay for the avoided capital expenditure) through periodic charges.

As Chapter 3 discussed, under the current pricing framework for water and sewerage services, the Tribunal uses the building block methodology to establish the agency's revenue requirement for each year of the relevant regulatory period (including a return on and of assets). It also determines a methodology for setting developer charges, which is based on the principle that customers in new growth areas should pay for the infrastructure costs attributable to the development.

The Tribunal proposes to include these elements in the framework for pricing recycled water schemes, subject to some modifications to accommodate avoided/deferred costs. The Tribunal has also made a determination for recycled water developer charges, which is discussed in Chapter 5.

5 DRAFT DETERMINATION FOR RECYCLED WATER DEVELOPER CHARGES

As Chapter 3 discussed, the water agencies currently levy developer charges for the provision of water, sewerage and drainage facilities in new developments. Developer charges are paid by developers to recover part of the infrastructure costs incurred in servicing new developments.

The Tribunal determines developer charges for the four agencies. Under the IPART Act, the Tribunal may set maximum prices or may determine a methodology for setting maximum prices. For developer charges, the Tribunal has chosen to determine a methodology[37] that the water agencies use to calculate charges for each development area. The IPART Act provides a mechanism for resolving disputes between water agencies and developers regarding the application of the methodology.

Developer charges serve two key functions. First, they provide a source of funding for the infrastructure to service new development. Second, they provide signals to homebuyers about the costs of urban development in a given location. It is the Tribunal's view that the combination of periodic charges and developer charges for new development (and redevelopment) should meet the full efficient cost of service provision.

In the same way that developer charges are levied to help recover the costs of providing water and sewerage services, in most new development areas it will be necessary for water agencies to recover part of the cost of recycled water schemes via developer charges.

An overview of the Tribunal's draft determination for recycled water developer charges is set out below. The following sections explain this determination in more detail.

5.1 Overview of Tribunal's draft determination

The Tribunal has made a draft determination for recycled water developer charges. The draft determination establishes the methodology that the water agencies must use to calculate recycled water developer charges. This methodology is consistent with the one for calculating water and sewerage developer charges.

Under the draft methodology, the developer charge for recycled water will recover the efficient capital cost of the scheme attributable to recycled water customers less the water agency's operating surplus from periodic charges for recycled water. The operating surplus is the present value of the difference between the water agency's operating revenue and efficient operating costs.

Water and sewerage developer charges are calculated for geographical areas defined in development servicing plans (DSPs). The water agencies determine the boundaries of the DSPs to generate meaningful signals for developers. It is anticipated that recycled water schemes will be self-contained and that their boundaries will form the DSP. This is consistent with submissions by Sydney Water, Hunter Water and Gosford Council proposing that recycled water prices should be cost-reflective on a scheme-by-scheme basis.[38]

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37 Section 13A of the IPART Act provides for the setting of a methodology to calculate maximum prices.

38 Sydney Water Corporation submission, p 1; Hunter Water Corporation submission, p 4; Gosford City Council, p 9.

The developer charges methodology for recycled water differs from that used to calculate water and sewerage developer charges in that it makes explicit provision for the inclusion of avoided costs associated with recycled water projects.

The recycled water developer charges formula is shown in Box 5.1.

Box 5.1 The recycled water developer contribution formula[39]

The total recycled water developer contribution (DC_{RW}) per property is calculated as:

$$\frac{DC_{RW} = K - PV_r(R_i - C_i)}{PV_r(ET)} - \frac{PV(AC_i)}{PV_r(ET)} \quad \text{for i years 1,….n; n = 30}$$

Where

K = the present value of capital costs recoverable from recycled water schemes discounted at rate r

R_i = the revenue expected to be recovered from recycled water customers in the scheme

C_i = the operating, maintenance and administration costs expected to be spent in servicing customers in the area in each year i

r = the cost of capital and must be equivalent to the WACC used to calculate the return on capital for water and sewerage prices

n = the forecast horizon for the assessment of future revenues and costs and must = 30 years

AC_i = the avoided cost calculated according to the Guidelines for Calculation and Treatment of Recycled Water Avoided Costs and approved by the Tribunal

ET = the number of equivalent tenement in the development

5.2 Establishment of development servicing plans for recycled water schemes

The agencies will be required to provide the same information for recycled water Development Servicing Plans (DSPs) as for those of other water services. That is, agencies must prepare a DSP for each recycled water scheme DSP area and each plan must:

- be exhibited for a minimum of 30 working days
- follow the format laid down in the recycled water developer charges determination
- show the calculated developer charge for recycled water and the basis on which it is calculated
- clearly explain the basis on which DSP boundaries are established
- include charges on a per equivalent tenement (ET) basis[40]
- compare the calculated developer charge with the existing charge.[41]

39 Based on IPART Determination no. 9, *Developer charges from 1 October 2000.*

40 Equivalent tenement is a measure of the demand a single residential dwelling will place on the infrastructure for a new development.

41 For more information on the elements for inclusion in a DSP, refer to the Tribunal's report accompanying Determination no.9, entitled *Developer Charges from 1 October 2000.*

In addition to exhibiting the DSP for at least 30 working days before adoption, each agency must:

- Advertise the date when a DSP is to be made or reviewed and the start date of the exhibition period. Relevant information including the length of the exhibition period is to be incorporated in the advertisement.
- Inform the Urban Development Institute of Australia (UDIA), the Housing Industry of Australia (HIA), and any relevant developers and landowners of the start date of an exhibition period at least 10 working days before that start date.
- When adopted, forward the DSP to the Tribunal for registration. At the time of forwarding the DSP, the agency is to inform the Tribunal of any submissions lodged during the exhibition period. The Tribunal will then register the DSP.

The format of the DSPs for recycled water must include the same elements as the DPSs for other water services. These are included in schedule 3 of the recycled water developer charges determination.

5.3 Definition and valuation of assets

The developer charges determination defines recycled water assets on the basis of when they were commissioned, relative to the commencement of this methodology (ie, 2006). This is consistent with the approach in the water and sewerage developer charges determination. However, unlike water and sewerage assets, the majority of recycled water assets will be commissioned in the future.

For valuation purposes, the determination divides assets commissioned after 2006 into those commissioned when the DSP is prepared and those not yet determined at that time. The Tribunal's determination regarding asset valuation is that both pre- and post-2006 assets that are already commissioned at the time the DSP is prepared must use the Modern Engineering Equivalent Replacement Asset (MEERA) valuation approach. Assets not yet commissioned must be based on an estimate of actual efficient cost at the time of commissioning.

5.4 Costs to be excluded from recycled water developer charges

Similar to water and sewerage developments, each recycled water development should be charged for that part of the service capacity of existing and future recycled water assets that it uses or will use.

The key difference between recycled water developer charges and those for other water services is that the charge for recycled water must be adjusted to take into account any costs that are avoided or deferred as a result of the recycled water scheme, as well as any up-front capital payment by developers (aside from developer charges) and any subsidies received by the water agency in relation to the project. This ensures that costs are shared equitably and that there is no double counting of costs to be recovered through recycled water charge overall.

The Tribunal has decided that the value of all assets attributed to the recycled water scheme must be included when calculating developer charges for recycled water with the exception of:

- assets whose capacity is unlikely to be fully utilised over the planning horizon relevant for that asset
- the capacity of an asset that was made available by changes in land use patterns
- assets funded by developers and transferred free of charge to the agency
- that part of an asset provided for a reason other than to service growth
- any asset that was unreasonably oversized relative to system and capacity requirements, based on available demographic data at the time it was commissioned
- the portion of any asset legitimately recovered from customers other than recycled water customers.[42]

5.5 Interpretation of 'nexus' in the calculation of developer charges

The water and sewerage determination requires that water agencies must demonstrate a 'nexus' (close connection) between the development and the assets to serve that development. This is to ensure that developer charges are not used as a means of recovering costs that are unrelated to providing services to a given development.

Headworks (water supply) infrastructure is included in water developer charges for all the agencies. Within each agency's area of operation, the headworks component of the water developer charge has been common to all customers, as the water supply for the whole customer base has traditionally come from the same source (or connected sources).

With the advent of more diversified water supply sources, it is possible that an alternative water supply such as recycled water will defer or avoid the need to augment an existing water source (eg raising a dam wall) or build a new one.

In this way, the beneficiaries of the investment in the recycled water scheme include all water customers because it will avoid the cost of the water supply augmentation. It is the Tribunal's view that although the recycled water assets are not physically connected to the water supply of all new water customers, there is a clear nexus between the recycled water scheme and the water supply because it displaces potable water use and as such avoids or defers water supply investment.

On this basis, where water agencies can demonstrate that there is an avoided or deferred cost of potable water supply augmentation due to a recycled water scheme, the present value of the avoided or deferred cost can be recovered in the developer charge for *water* services in new developments (rather than through recycled water prices).[43]

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42 Either allowed by the Tribunal based on demonstration according to the *Guidelines for Calculation and Treatment of Avoided and Deferred Costs of Recycled Water*, or due to a government directive that costs be recovered from the broader customer base.

43 The water agency will have to demonstrate to the Tribunal the 'with' and 'without' recycled water scenarios, according to the Guidelines for the calculation and treatment of recycled water costs, in order for the avoided or deferred costs to be included in the RAB and the developer charge.

It is anticipated that there will be very few cases where this will occur. Most recycled water schemes will not be large enough to have a significant effect on the timing of a major water supply augmentation. Those that do will usually be included in water agencies' Integrated Water Resource Plans (IWRP). It will only be schemes that replace large volumes of potable water and were not previously in the IWRP that are likely to offset water supply costs in this way.

5.6 Calculation of operating costs and revenues

The developer charges methodology requires that agencies calculate the operating surplus of the recycled water scheme and deduct this from the present value of the capital component of the scheme. The operating surplus is given by subtracting the operating costs from the operating revenues.

For the purposes of calculating the operating surplus, the operating costs should be based on the estimated operating costs for each individual recycled water scheme. he Tribunal has decided that for the purpose of calculating the operating surplus, water agencies must calculate usage revenues by multiplying the recycled water usage charge by an estimate of typical recycled water demand per single residential dwelling.

Consultation with the water agencies suggests that, with the exception of Rouse Hill, there is little data on typical household recycled water demand. However, it is likely that Rouse Hill is a good indicator of the recycled water demand for toilet flushing and outdoor use (recycled water is not used for laundry use at Rouse Hill). Average recycled water use at Rouse Hill is currently around 100 kilolitres per year.

After including an allowance for laundry use, the Tribunal has decided that for the purposes of calculating the operating revenue for developer charges, agencies should use a figure of 110 kilolitres per equivalent tenement per year for recycled water use.

5.7 Discount rate

For recycled water developer charges, the Tribunal has decided to align the discount rate with the weighted average cost of capital (WACC) used by the Tribunal when making water and sewerage price determinations.

The WACC reflects the opportunity cost to the agency of funding infrastructure works. It is the Tribunal's view that the risks to water agencies of building recycled water infrastructure where schemes are subject to developer charges (ie, mostly mandated schemes) are similar to those for water and sewerage infrastructure.

5.8 Reviews of recycled water DSPs

Recycled water developer charges will be subject to the same review processes as developer charges for other services. That is, water agencies must review DSPs and developer charges every five years or as required by the Tribunal as part of a periodic review of charges.[44]

[44] Agencies may review DSPs at the same time every 5 years or on a rolling 5 year cycle. However, except when required by a Tribunal determination, each DSP is to be reviewed once, and only once, every 5 years.

5.9 Dispute resolution

Under section 31 of the IPART Act, the Tribunal may arbitrate disputes between water agencies and developers, where the developer is dissatisfied with the way an agency has calculated its developer charges.

6 DRAFT DETERMINATION ON RECYCLED WATER PRICES IN ROUSE HILL

Sydney Water provides recycled water to over 17,000 customers in the Rouse Hill Development Area. Drought restrictions in recent years have highlighted the benefits to customers of access to recycled water. During this time, these residents have been able to use recycled water without restriction.

In its 2005 determination of water, sewerage and drainage prices for the metropolitan water agencies, the Tribunal decided that prices for recycled water in Rouse Hill would increase by the movement in the CPI over the regulatory period pending the outcome of this review. The recycled water usage charge was set at $0.29 per kilolitre (compared with $1.20 for potable water in 2005/06), with a fixed annual charge of $25.32 per single residential dwelling.[45]

Sydney Water is expanding the Rouse Hill recycled water scheme. This will result in approximately 20,000 additional lots and a total recycled water demand of around 4,000 megalitres each year by 2028. The Rouse Hill scheme is being developed in four stages, based on the timing of land releases.

The Tribunal now considers that periodic charges for recycled water at Rouse Hill should be revised so that they are consistent with its pricing framework for recycled water and with the pricing guidelines for mandated schemes as the Rouse Hill Development Area expands.

The Tribunal's draft determination for recycled water periodic charges in the Rouse Hill Development Area is summarised in the section below. The subsequent sections discuss this determination in more detail, including explaining why the Tribunal decided to set maximum prices for Rouse Hill, its considerations in relation to the costs to be recovered through recycled water prices, the maximum prices it has set, and the customer impacts of the determination.

6.1 Overview of Tribunal's draft determination

The Tribunal has made a draft determination for recycled water periodic charges at Rouse Hill. The Tribunal's draft decision results in a recycled water usage charge that increases each year, so that by the end of the price path it is equal to 80 per cent of the potable water usage charge. The fixed charge will reduce to $10.25 per year by 2008/09.

As part of this determination, the Tribunal has made draft decisions to:

- Set prices for the period 1 October 2006 to 30 June 2009[46] to generate total revenue of $4.58 million. This means that, on average, recycled water bills will increase by around $22 above inflation (real increase) in each year of the price path.
- Restructure recycled water prices by increasing usage charges. This will mean that customers will have more control over their recycled water bills. As a consequence customers that use less recycled water will experience smaller bill increases than high users.

45 The fixed charge varies according to the size of the water meter fitted for other types of properties to reflect the demand placed on the system.

46 This is consistent with the price path for water and sewerage services.

- Require Sydney Water to revise its developer charge for recycled water at Rouse Hill to reflect the higher revenue from periodic charges. This will reduce the Rouse Hill developer charge.

6.2 Why the Tribunal decided to set maximum prices for Rouse Hill

As the next chapter will explain, the Tribunal has made a draft decision that it will only make a price determination for mandated recycled water schemes where there is sufficient information for it to set efficient prices. The Tribunal considers that the Rouse Hill scheme is a mandated scheme and that there is sufficient information about this scheme for it to set efficient prices.

The Tribunal also considers that, in the light of this review, the current Rouse Hill recycled water prices (set as part of the 2005 price determination for Sydney Water) need to be revised. The factors that influenced this view include the following:

- The Rouse Hill recycled water price structure, with its low usage charge, was originally developed to encourage the use of recycled water. During peak usage periods recycled water supplies cannot always meet demand and have to be topped up with potable water. Around 20 per cent of total recycled water demand is currently met by potable water. It has been suggested that the relatively low price of recycled water has led to its overuse.
- Potable water is sold to customers at $1.20 per kilolitre, but 'top-up' water to supplement recycled water is charged at the significantly lower recycled water price. The low usage charge does not send an efficient price signal, particularly when both recycled water and potable water are supply constrained.
- Rouse Hill recycled water periodic charges do not currently recover the operating costs of the scheme. This means that part of the operating costs are subsidised.
- The Tribunal wishes to ensure that the price for Rouse Hill is consistent with its draft pricing guidelines for mandated schemes and that the transition from current prices is managed appropriately.

6.3 Recovering the costs of recycled water at Rouse Hill

In its 2005 price determination for Sydney Water, the Tribunal considered Sydney Water's overall revenue requirement for the period 1 October 2006 to 30 June 2009. This requirement included forecast efficient capital and operating expenditure for Rouse Hill. Based on the prices set as part of this determination, Sydney Water will recover $2.81 million in revenue from recycled water charges from 1 October 2006 to 30 June 2009.

However, recycled water periodic usage and fixed charges for the Rouse Hill scheme were not set to recover the costs of operating this scheme. As a result, the revenue generated by these periodic charges does not currently recover the full efficient cost of operating the scheme.

In making this 2006 draft determination on Rouse Hill periodic charges, the Tribunal has considered the costs to be recovered, taking into account the forecast recycled water sales and customer numbers, forecast operating costs, forecast capital expenditure related to the Rouse Hill scheme. Its considerations and findings on each of these matters are summarised below.

6.3.1 Forecast recycled water sales and customer numbers

The Tribunal needs to consider the agencies' forecast recycled water demands and customer numbers because:

- Underlying assumptions about how the demand for water and wastewater services will grow over the determination period affect the agencies' forecast capital and operating costs.
- Prices are set based on forecast water sales and customer numbers. If these forecasts are not reasonable, there is a risk that the prices the Tribunal sets will lead to the agency significantly over or under recovering its required revenue.

The forecast property numbers for Rouse Hill are based on data provided to Sydney Water by the Department of Planning. These assumptions were assessed as part of the water and sewerage price review in 2005 and therefore the Tribunal has decided to adopt them for the purposes of calculating prices for Rouse Hill as part of this 2006 determination. The forecast property numbers are shown in Table 6.1.

Table 6.1 Property forecasts adopted in determination

Financial year	2005/06	2006/07	2007/08	2008/09
Rouse Hill properties	17,159	18,014	18,962	19,931

Sydney Water's modelling assumes annual recycled water demand of 113 kilolitres per property. However, actual Rouse Hill consumption data indicates that average recycled water demand over the last eight years was 105 kiloliters per property.

Based on this evidence, the Tribunal has decided to use the average use 105 kilolitres per property as the estimate for annual household demand for the purposes of determining recycled water prices for Rouse Hill. Recycled water demand forecasts used to set Rouse Hill recycled water prices for 2006/07 to 2008/09 are shown in Table 6.2.

Table 6.2 Metered water sales forecasts adopted in determination (ML)

Financial year	2005/06	2006/07	2007/08	2008/09
Rouse Hill forecast recycled water demand	1.802	1.891	1.991	2.093

The Tribunal notes that increases in recycled water usage prices may lead to a reduction in demand for the product, particularly as recycled water will be used for outdoor irrigation (the most price elastic component of water demand). This has not been factored into demand forecasts for this regulatory period; however, it may be considered at the next price review. Lower demand over the price path will result in less revenue for Sydney Water.

6.3.2 Forecast operating costs

The Tribunal has reviewed Sydney Water's forecast operating costs for the Rouse Hill recycled water scheme, taking into account Sydney Water's explanation of the assumptions that underlies this forecast (see Table 6.3 below).

Table 6.3 Basis for Sydney Water's operating cost forecasts[47]

Cost activity	Basis for cost estimate
Rouse Hill STP Recycled Water Maintenance	Actual maintenance costs assigned to recycled water based on the component of the sewage treatment plant (STP) receiving the maintenance work and/or description of the maintenance work itself.
Potable Water Top-Up	Volume of potable water use in ML based on average from historical data. Costed at the wholesale water price and treatment (Prospect BOO tariff).
Rouse Hill STP Treatment Process Management	Based on an allocation of time from the Water Recycling management team.
Water Quality Sampling & Analysis	Data based on the historical number of tests performed for the recycled water product. These were costed on an average cost per test basis.
Network Operations	Direct operating costs for the recycled water network were identified. These included electricity required for recycled water pumping and storage activities.
Network Maintenance	Maintenance times for the recycled water systems based on actual data. This was costed at an average hourly rate for this work.
Network Management	Based on an allocation of time from the Water Reuse management team.
Community Education and Information Programs	Based on contracted services for advertising, printing and design of information flyers and brochures.
Cross-Connection Inspection Programs	Based on a chronology of inspection protocols in place during the development phases of the Rouse Hill area. Plumbing Inspection & Assurance Services provided details of number of inspections required and average cost per inspection.
Customer Service & Contacts	Based on an analysis of the overall SWC cost to serve customers Incremental costs relevant to recycled water are $2.50 per property, based on: Additional meter reading for recycled water meters ($2.20 per property); An allowance for additional field services (meter faults & replacement) and call centre contacts ($0.30 per property)

The Tribunal has accepted Sydney Water's cost estimates with the following adjustments:

- Potable water used to top up the recycled water system is costed at the potable water retail usage price rather that the wholesale price charged to Sydney Water.
- Sydney Water proposed that operating costs be indexed by a ratio greater than the Consumer Price Index to reflect wage rises above inflation.[48] The Tribunal's finding is that this cost increase should be offset by productivity improvements and therefore has indexed operating costs by the CPI only.

Taking these adjustments into account, the efficient operating costs of providing recycled water at Rouse Hill over the price path are as shown in Table 6.4. These operating costs are almost $2 million more than would have been recovered under the 2005 price determination.

47 Provided by Sydney Water Corporation June 2006.

48 Labour costs make up 80% of operating costs associated with supplying recycled water at Rouse Hill.

Table 6.4 Operating costs adopted for Rouse Hill recycled water prices ($M)

Financial year ($2005/06)	2006/07	2007/08	2008/09	Total
Rouse Hill forecast operating costs	$1.716	$1.797	$1.857	**$5.371**

* The price and bill analysis assumes an inflation rate of 2.5 per cent per annum in each year of the determination

6.3.3 Forecast capital expenditure

Sydney Water's capital expenditure at Rouse Hill is limited to building or upgrading recycled water treatment facilities and renewals or repairs to the system. This is because the Rouse Hill scheme was initially fully funded by developers. After completion of stage 1 of the scheme, Sydney Water took responsibility for all recycled water treatment works at Rouse Hill, but developers will continue to fund the remainder of the capital cost of the distribution system.

Capital costs associated with the Rouse Hill scheme will be predominantly growth-related during the price path because the scheme is expanding. It is unlikely that there will be significant capital expenditure by Sydney Water on renewal or replacement of assets in a relatively new system such as this one. Any capital expenditure during the price path will be reviewed for prudence at the next price review.

6.4 Recycled water prices for Rouse Hill

After considering all the circumstances relating to recycled water at Rouse Hill, including Sydney Water's costs, the supply and demand imbalance for recycled water in this area, and the potable water top-ups that must be made to accommodate this, the Tribunal has made a draft decision to set the maximum Rouse Hill periodic recycled water prices shown in Table 6.5 below.

Given the high proportion of potable water currently used to top-up the Rouse Hill recycled water system, the Tribunal considers that the usage component of the charge should be increased relative to the fixed charge to encourage more efficient use of recycled water, and to better reflect the incremental cost of topping up the scheme. The Tribunal's draft decision is that this charge will increase over the determination period, to reach 80 per cent of the potable water price by 1 July 2009 (in real terms). If potable water top-ups continue to be significant, the Tribunal will consider increasing this charge further at the next price review, to bring it in line with the potable water price.

The Tribunal also considers that the fixed component of the charge should be retained, but that the level of this charge should be reduced to offset part of the increase in the usage charge. Its draft decision is to reduce the fixed charge to $10.25 by the second year of the price path.

The River Management Charge for drainage services at Rouse Hill will be the same as determined in the 2005 water and sewerage price determination.

Table 6.5 Draft charges for recycled water services in Rouse Hill (Dollars of the day)

Charge	Current charges	2006/07	2007/08	200/09
Recycled Water usage per kL	0.29	0.46	0.70 x $(1+\Delta CPI_1)$	1.08 x $(1+\Delta CPI_2)$
Recycled Water Service Access Charge (based on meter size)				
20mm	25.32	20.72*	15.48 x $(1+\Delta CPI_1)$	10.25 x $(1+\Delta CPI_2)$
For properties with meter size >20mm the formula to apply is	$(\text{nominal diameter})^2$ x (charge for 20mm meter)/400			

Where:

$(1+\Delta CPI_1)$ Is the movement in the CPI between the four quarters ending 31 March 2007 and the four quarters ending 31 March 2006.

$(1+\Delta CPI_2)$ Is the movement in the CPI between the four quarters ending 31 March 2008 and the four quarters ending 31 March 2006.

* This assumes the price is applied for the full financial year. As the determination will apply from 1 October 2006, the fixed charge will be apportioned accordingly.

6.4.1 Impact on the recycled water developer charge for Rouse Hill

There is a single development servicing plan (DSP) for all four stages of the Rouse Hill Development Area. In the absence of a specific recycled water developer charges determination, the developer charge for recycled water was calculated using the Tribunal determined developer charges methodology for water and sewerage services. The developer charge for recycled water in Rouse Hill from 2001 to 2006 was $2,890 (in 2005/06 dollars).

Sydney Water is currently reviewing its development servicing plans and developer charges across its area of operations. Based on the recycled water prices determined in 2005, Sydney Water advised that the recycled water developer charge for Rouse Hill was calculated at $2,706 per ET. Increasing the periodic charges for recycled water services at Rouse Hill will see developer charges fall to an estimated $2,111.[49]

6.5 Implications for customers, water agencies and the environment

The Tribunal's draft decisions in relation to recycled water charges for the Rouse Hill Development Area have been made in accordance with the requirements of the IPART Act, including the factors contained in Section 15 of this Act (see Appendix A). In summary, the Act requires the Tribunal to consider the impacts of the maximum prices it determines on customers, on the agencies (as owners, operators and managers of the assets), and on the environment. The Tribunal explicitly considered these impacts and is satisfied that they achieve a reasonable balance between the competing Section 15 matters.

[49] Recall that the operating surplus from periodic charges is part of the developer charge determination. The higher the periodic revenue, the lower the developer charge for a given DSP.

6.5.1 Customer impacts

The Tribunal's analysis shows that, in general, its decisions will increase customers' bills for recycled water in Rouse Hill. Assuming demand for recycled water does not change, the key implications for customers are as follows:

- The determination is expected to increase the recycled water bill of a customer with average recycled water consumption (105kL per year) by $10.02 in 2006/07, a further $25.46 in 2007/08 and a further $37.94 in 2008/09.
- For a customer using 50kL of recycled water per year, the determination is expected to increase their bill by $3.05 in 2006/07, a further $8.90 in 2007/08 and a further $15.39 in 2008/09.
- For a high-use customer consuming 250kL per year, the determination is likely to increase their bill by $28.40 in 2006/07, a further $69.13 in 2007/08 and a further $97.37 in 2008/09. These increases include the effect of inflation (nominal increase).

Table 6.6 Recycled water bills for different levels of use (dollars of the day)

	2005/06	2006/07		2007/08		2008/09	
kL	Bills	Bills	Increase	Bills	Increase	Bills	Increase
50	$ 39.97	$ 43.02	$ 3.05	$ 51.92	$ 8.90	$ 67.31	$ 15.39
75	$ 47.30	$ 53.51	$ 6.22	$ 69.94	$ 16.43	$ 95.58	$ 25.64
105	$ 56.09	$ 66.10	$ 10.02	$ 91.57	$ 25.46	$ 129.50	$ 37.94
150	$ 69.27	$ 84.99	$ 15.72	$ 124.01	$ 39.01	$ 180.39	$ 56.38
250	$ 98.57	$ 126.97	$ 28.40	$ 196.10	$ 69.13	$ 293.47	$ 97.37

However, the residents of Rouse Hill will continue to pay less on average for water, sewerage and recycled water services than comparable water and sewerage bill in the rest of the city (Table 6.7).

Table 6.7 Total bills for average water consumption of 300 kilolitres per year - water, sewerage and recycled water services (dollars of the day)

	2005/06	2006/07	2007/08	2008/09
Bill for customer not connected to recycled water	$ 809.91	$ 830.77	$ 855.73	$903.48
Rouse Hill total bills (assuming no change in demand)*	$ 740.00	$ 764.50	$ 808.30	$ 884.85
Bill saving due to recycled water use	$ 69.92	$ 66.28	$ 47.43	$ 18.62

* Recycled water demand is assumed to be 105 kilolitres of a total water demand of 300 kilolitres per year/

** The price and bill analysis assumes an inflation rate of 2.5 per cent per annum in each year of the determination.

A Rouse Hill customer using a combined potable and recycled water volume of 300 kilolitres per year will pay a total of around $130 less over the price path than a non-recycled water customer.

It should be noted that higher recycled water prices are likely to result in reductions in recycled water use of between 10 and 30 per cent. A household reducing its recycled water consumption by 10 per cent would save $26.11 over the price path. A reduction of 30 per cent would result in a total saving of $66.27 over the 3 years of the price path.

6.5.2 Agency impacts

The Tribunal's draft recycled water price determination will allow Sydney Water to operate, maintain, renew and develop the Rouse Hill recycled water scheme. This includes meeting the relevant regulatory standards in its Operating Licence, the Sydney Water Act and the environmental and public health standards regulated by the Department of Health (DoH) and the Department of Environment and Conservation for recycled water management. In relation to providing recycled water in Rouse Hill these standards include:

- Environment Protection Licence requirements relating to waste disposal.
- Environmental planning approvals, State Environmental Planning Policies (SEPPS), and other environmental protection and planning legislation.
- Monitoring requirements regarding the safety and quality of potable water provided to customers.
- Adhering to guidelines setting out the safe use of recycled water for various purposes (eg, urban/residential use, and more recently agricultural/irrigation use).

The maximum charges set for recycled water services in Rouse Hill are expected to enable Sydney Water to earn a real pre-tax rate of return of 6.5 per cent. This return is consistent with the rate of return allowed in the 2005 determination of water and sewerage prices.

6.5.3 Environmental impacts

The Tribunal considers that its decisions will help increase customers' awareness of the value of recycled water, and encourage them to use this resource carefully. It will also better reflect the costs of 'topping up' the recycled water system with environmentally costly potable water (and may reduce the volume needed to supplement the system). Higher prices for recycled water may reduce over-watering of outdoor areas. This would reduce excess run-off and the environmental impacts associated with it.

7 PRICING APPROACH FOR MANDATED RECYCLED WATER SCHEMES

For the purpose of this review, mandated schemes are defined as recycled water schemes to which customers are required to connect due to a government policy (such as BASIX or the Metropolitan Water Plan). The key criterion for determining whether a scheme fits into this category is whether there is an obligation on someone other than the water agency (such as the customer or the developer) to connect to the scheme, or to use recycled water from the scheme.

The NSW Metropolitan Water Plan notes the benefits of mandating recycled water schemes to encourage recycling where there are impediments to feasible schemes being developed. The plan lists several reasons for mandating schemes, including:

- to achieve policy objectives that are not delivered by the market
- to shift the traditional water supply paradigm to a more sustainable approach, and
- to encourage innovation and competition in new markets.

The Tribunal's draft decisions on the pricing arrangements for mandated recycled water services are summarised in the section below. The subsequent sections explain these decisions in more detail, including the Tribunal's considerations in relation to the form of regulation, its proposed pricing guidelines and its proposed approach for ensuring compliance with these guidelines.

7.1 Overview of Tribunal's draft decisions in relation to mandated schemes

The Tribunal's draft decision is that it will only make a price determination for mandated schemes where there is sufficient information for it to set efficient prices. On this basis, the Tribunal has only made a draft determination for recycled water prices in the Rouse Hill Development Area (see Chapter 6).

For other mandated recycled water schemes, the Tribunal's draft decision is to establish a set of pricing guidelines for the water agencies to use in calculating prices for recycled water services provided by mandated schemes.

In addition, the Tribunal has made a draft decision to require water agencies to ring-fence from the regulated parts of their businesses the costs and revenues of mandated recycled water schemes where the Tribunal has not made an explicit pricing determination.

The Tribunal considers that where customers are required to connect to or use recycled water, the water agency is in a position of significant market power. Even if customers are permitted to disconnect from the recycled water scheme, this would be costly. It would require re-plumbing toilets and laundries, and purchasing a rainwater tank where the recycled water scheme was built to meet BASIX requirements.

The vast majority of customers connected to mandated schemes are likely to be residential customers who purchase properties in new development areas with third pipe systems. The cost of installing and operating these schemes tends to be higher than those of non-residential recycling schemes. It is highly unlikely that the cost per kilolitre of these recycled

water schemes will be less than the potable water price. As these customers effectively have no choice about connecting to recycled water, there is scope for water agencies to charge excessively high prices for it.

Given these circumstances, the Tribunal considers that it is not appropriate to allow prices to be set through direct negotiation between water agencies and customers where these customers are required to connect to recycled water schemes. Rather, it believes that a simpler and more transparent approach to price setting is needed. However, because water recycling is a relatively new industry in NSW, the Tribunal also considers that there is insufficient information to enable it to set efficient prices for all mandated recycled water schemes.

For these reasons, the Tribunal has made a draft decision that it will only determine a price for mandated schemes where there is sufficient information for it to set efficient prices. For mandated schemes where there is insufficient information, the Tribunal will establish pricing guidelines and strongly recommend that the water agencies use these guidelines to calculate prices for recycled water services provided by these schemes. It has also developed a draft version of these guidelines.

7.2 Tribunal's considerations on the form of regulation

The Tribunal considered four main approaches for regulating the price of recycled water services provided by mandated schemes where there is insufficient information for it to set efficient prices – each of which involves a different degree of regulatory intervention in the price setting process. These approaches include:

- the Tribunal setting prices on a scheme-by-scheme basis
- the Tribunal setting prices on a 'postage stamp' basis
- the water agencies setting prices that are consistent with a pricing methodology established by the Tribunal
- the water agencies setting prices that are consistent with pricing guidelines established by the Tribunal.

Taking into account the objectives for recycled water pricing and other matters discussed in Chapter 3, the Tribunal concluded that, on balance, the most appropriate approach is for the water agencies to set prices that are consistent with pricing guidelines established by the Tribunal. The main benefits of this approach are that it:

- allows flexibility in setting recycled water prices to take into account the particular characteristics of the scheme and its customers
- provides a clear framework for calculating the maximum revenue that may be recovered through recycled water prices and from the broader community
- does not lock in prices that may be inefficient due to a lack of knowledge and experience in recycled water provision
- does not preclude postage stamp pricing by agencies if they prefer this option.

In the Tribunal's view, setting prices on a scheme-by scheme basis would generate a large volume of work for it (in conducting regular determinations) and for the water agencies (in collecting data and reporting). As a result, this approach would impose significant regulatory costs on the provision of recycled water services.

The Tribunal also considers that setting maximum prices on a postage stamp basis or determining a pricing methodology could result in inefficient pricing outcomes. At this time, the recycled water industry is not sufficiently established to determine a postage stamp price based on 'average' costs across the system. There is little evidence about the costs of implementing mandated recycled water schemes, the degree of diversity between schemes, and customers' willingness to pay for recycled water. Similarly, determining a methodology that meets the requirements of the IPART Act (ie, that a methodology must allow agencies to calculate a maximum price) could be overly prescriptive or fail to achieve the pricing objectives of economic efficiency, revenue adequacy, simplicity and equity.

The Tribunal consulted with the water agencies' to seek their views on the merits of establishing guidelines for recycled water prices versus making a determination. While the water agencies initially proposed a stronger form of price regulation to ensure certainty and consistency for them and their customers, they indicated that if guidelines provided a clear pricing framework, this would be sufficient.

One of the main disadvantages of the pricing guidelines approach is that these guidelines do not fall within the definition of a price determination under the IPART Act. This means that the Tribunal's proposed pricing guidelines will not have the legal standing of a formal price determination and therefore there is no standing power for the Tribunal to review the resulting prices.

However, the Tribunal does have a standing power to review agencies' pricing policies, and may use the pricing guidelines as a basis for assessing these policies in future.[50] If there is evidence of abuse of monopoly power, the Tribunal may determine prices in future.

7.3 Tribunal's proposed pricing guidelines for mandated schemes

The Tribunal has developed a draft set of pricing guidelines, to provide direction to agencies in determining:

- the maximum cost that can be recovered from a recycled water scheme
- any offsets against this total cost to account for avoided costs, deferred costs, subsidies received or up-front costs paid by a party other than the water agency or the customer[51]
- the total cost that can be recovered from recycled water customers
- how costs should be recovered using different price structures, depending on the circumstances.

These proposed pricing guidelines are set out in Box 7.1 below.

50 *Independent Pricing and Regulatory Tribunal Act 1992*, Section 11(1)(b).

51 For detail on the basis of these costs, their calculation and recovery see Chapter 4 and Appendix D.

7.4 Compliance with recycled water pricing guidelines for mandated schemes

The pricing guidelines for mandated recycled water schemes provide a clear framework for developing pricing arrangements to protect the interests of customers, while also providing some flexibility to water agencies to establish prices appropriate for different circumstances. However, as noted above, the guidelines do not have the legal standing as a formal price determination. This means that unlike current water and sewerage pricing arrangements, there is no standing power for the Tribunal to review the resulting prices.

The exception is where water agencies wish to recover their avoided or deferred costs from the broader water and sewerage customer base. The Tribunal will allow this component of recycled water costs to be recovered from the broader customer base if the water agency can demonstrate that they were calculated according to the *Guidelines for Calculation and Treatment of Avoided or Deferred Costs for Recycled Water* in Appendix C of this report. In this way, these costs will be subject to review at the next water and sewerage price determination.

While guidelines do not constitute a price determination under the IPART Act, section 11(1)(b) of the Act provides for the Tribunal to conduct "a periodic review of *pricing policies* in respect of government monopoly services" supplied by a government agency specified in Schedule 1 of the IPART Act. This allows the Tribunal to review compliance of agencies' recycled water pricing arrangements with the *Pricing Guidelines for Mandated Recycled Water Schemes*.

In addition to this, the Tribunal will seek amendments to the IPART Act to give it a standing power to establish enforceable pricing guidelines in addition to powers to set prices or a methodology.

While this review only applies to the four metropolitan water agencies, it is likely to have implications for recycled water prices to be charged by the private sector under third party access arrangements. The Government's consultation paper *Creating a dynamic and competitive metropolitan water industry* states that:

> Licensed [private sector] suppliers will also be subject to price regulation if they are a monopoly service provider. Amendments are proposed to the *Independent Pricing and Regulatory Tribunal Act 1992* to extend the legal basis for price regulation to non-government owned monopoly services.[52]

52 NSW Metropolitan Water Directorate (2006), *Creating a dynamic and competitive metropolitan water industry*, p 1.

Box 7.1 Draft Pricing Guidelines for Mandated Recycled Water Schemes

1. The maximum revenue that can be earned from a recycled water scheme is the efficient "total direct cost" of the scheme, given by formula **A** below:

$$PV_r(K_i + OC_i + JC_i) \text{ for i years } 1,....n: n = 30 \quad \textbf{(A)}$$

Where
K is the total capital cost associated with the project, including recycled water treatment plants, other infrastructure and storage.
OC is the annual operating cost of the scheme, including pumping, treatment, chemicals, labour, monitoring and any other costs of operating the system.
JC is the share of joint costs allocated to the recycled water scheme
n is the life of the project in years and for the purposes of calculating recycled water prices is equal to 30 years
r is the cost of capital and should be equivalent to the WACC used to calculate the return on capital for water and sewerage prices

2. The "cost offset" that the water agency can recover from parties other than recycled water customers must be calculated using formula **B** below:

$$PV_r \text{ (Subsidy}_i + \text{Avoided Cost}_i + \text{Deferred cost}_i + \text{Govt directive**)} \quad \textbf{(B)}$$

3. If the agency wishes to recover the "cost offset" from water or sewerage customers, it must demonstrate to the Tribunal at the next metropolitan water price review that costs have been calculated and allocated in accordance with the *Guidelines for Calculation of Avoided and Deferred Costs of Recycled Water Schemes*[*]

4. The retail price of potable water used to supplement the recycled water scheme must be included as an operating cost of the scheme when calculating the total direct cost.

5. The total revenue that the water agency can recover from recycled water customers is the "recycled water cost", calculated using the formula: **A – B**

6. Prices must include a usage component, which must be no greater than the potable water usage price. The usage charge must send appropriate consumption signals and should not encourage excessive use of recycled water. If recycled water demand exceeds supply more than 10% of the time, the usage charge should equal the potable water price.

7. Prices may include a fixed component, which must not be so high as to act as an incentive for customers to disconnect from the recycled water scheme.

8. Where customers are subject to developer charges, the developer charge must be calculated according to the recycled water developer charges methodology.

9. Where customers are not subject to developer charges, any residual cost not recovered through usage charges must be recovered via an annual fixed charge or in the case of non-residential customers, may be recovered through a negotiated up-front capital contribution.

10. Other than costs included in the "deduction amount" all costs must be recovered through recycled water usage, fixed and developer charges unless the government formally directs the Tribunal to pass-through of these costs to non-recycled water customers.

11. Agencies may review recycled water prices no more often than once every 3 years. Between price reviews, recycled water prices may be indexed for inflation.

12. Recycled water prices must be made available to customers and must be published on the agencies' websites.

13. Costs and revenues from recycled water schemes must be ring fenced from the regulated business

* See Appendix C for the draft guidelines

** This means that the Government has directed the Tribunal to allow water agencies to recover a portion of costs from customers other than recycled water users

8 PRICING APPROACH FOR VOLUNTARY RECYCLED WATER CUSTOMERS

For the purpose of this review, voluntary recycled water customers are defined as those customers who connect to a recycled water scheme at their own discretion. The key criterion for determining the customers who fit into this pricing category is whether they have a substitute water product available to them (usually at a regulated price) such as potable water or river water. If they do, water agencies cannot exercise a high degree of market power over these customers and recycled water is not a monopoly product.

The vast majority of customers coming within this category will be non-residential customers. They could be customers using potable water in existing areas, customers in new development areas that choose to connect to available recycled water schemes, or agricultural irrigators using river water.

Typically, these types of recycled water schemes are built because customers can gain a commercial advantage from the availability of recycled water at a lower cost than potable water, or because recycled water is more reliable in terms of quality or quantity than the alternative. In some cases, water agencies will have an incentive to encourage these schemes because they are the lowest cost means of meeting water supply or other obligations (eg, environment protection licence requirements).

The Tribunal's draft decisions on the pricing arrangements for recycled water services for voluntary customers are summarised in the section below. The subsequent sections explain these decisions in more detail, including the Tribunal's considerations in relation to the form of regulation, and its proposed pricing principles for these customers.

8.1 Overview of Tribunal's draft decisions in relation to voluntary customers

The Tribunal's draft decision is not to make a price determination for recycled water services provided to voluntary customers, but to establish a set of high-level principles to guide price negotiations between the water agencies and these customers.

In addition, the Tribunal has made a draft decision to require water agencies to ring-fence the costs and revenues of non-mandated recycled water schemes from the regulated parts of their businesses.

8.2 Tribunal's considerations on the form of regulation

The Tribunal considers that where users have alternative options to recycled water, the case for price regulation is not compelling. For example, where industrial users have access to a potable water supply, or irrigators have access to low-cost irrigation water, the water agency is unlikely to have sufficient market power to exploit to the detriment of these users, as this power is limited by the ability of the user to fall back on the alternative supply at a regulated price.

Given the relative balance between the market power of the agencies and the customers concerned, the Tribunal believes the most appropriate and efficient approach is for these prices to be negotiated between these parties.

In light of the above considerations, the Tribunal has made a draft decision to allow the agencies and "voluntary" customers to negotiate prices for the supply of recycled water. However, the Tribunal wishes to ensure that the water agencies do not shift costs from these voluntary customers to the regulated part of their businesses. Accordingly, the Tribunal has made a draft decision to require the water agencies to ring-fence the costs and revenues of non-mandated schemes from their regulated businesses.

If water agencies wish to recover avoided or deferred costs from the broader customer base, they must demonstrate that they have calculated these according to the draft *Guidelines for the Calculation and Treatment of Avoided and Deferred Costs of Recycled Water* (see Appendix C).

8.3 Tribunal's proposed high-level pricing principles for voluntary recycled water customers

The Tribunal's proposed principles to apply to the pricing of recycled water supplied to voluntary users are as follows:

- Recycled water prices should recover the costs of providing the recycled water service unless there are clearly identified avoided costs or public benefits
- Costs of recycled water schemes are to be recovered from recycled water customers unless:
  - costs of investment in water and sewerage systems are deferred or avoided due to the implementation of the scheme
  - a subsidy has been paid to reflect public benefits resulting from the recycled water scheme
  - the Government directs that costs be recovered from non-recycled water customers.
- Any costs to be recovered from parties other than recycled water customers must be calculated in accordance with the *Guideline for Calculation and Treatment of Avoided and Deferred Costs for Recycled Water*.[53]

The Tribunal's proposed principles for voluntary customers will not have the legal standing of a formal price determination. However, the Tribunal will consider the recovery of avoided and deferred costs from the broader water and sewerage customer base, at each water and sewerage price determination.

The Tribunal will seek changes to the IPART Act to give it formal powers to arbitrate disputes that may arise in the negotiation of prices for voluntary schemes. This is consistent with the changes to the IPART Act proposed for sewer mining and third party access.

[53] See Appendix C.

9 SEWER MINING

For the purposes of this review, sewer mining is defined as *"the extraction of raw sewage from a point in the sewerage network upstream of a sewage treatment plant (STP), for treatment and recycling by a party other than the operator of that network"*.[54] As such, sewer mining represents one means by which recycled water can be supplied.

Sewer mining could be undertaken by a water agency or, more typically, by a third party. The party undertaking sewer mining may either treat and use the sewerage for its own purposes, or could establish itself as a supplier to other customers. Sewer mining could be on a relatively small scale (eg, water for golf courses) or a larger scale (eg, water for large industrial users).

To date, limited sewer mining has taken place in NSW. Perhaps the most significant example of a sewer mining customer is the Sydney Olympic Park Authority, which sources sewage from sewer mining and stormwater harvesting for treatment and reuse for non-potable uses in suburbs such as Newington. Recently, Kogarah Council became the first council in Sydney to pilot sewer mining, using recycled water to irrigate its parks, playing fields and a golf course. There is also potential for new sewer mining schemes at Kurnell and Botany.

Streamlined procedures for dealing with sewer mining proposals are being developed as part of the Government's 2006 Metropolitan Water Plan. Sydney Water has recently issued guidelines for sewer mining outlining the application process, information requirements and commercial arrangements.[55]

Other water agencies are also examining potential sewer mining projects. Gosford Council is funding a sewer mining demonstration project at the Gosford Race Course whereby sewage will be taken from a local carrier, treated by subsurface flow constructed wetland and used for irrigating the racecourse and adjacent playing fields[56]. Wyong Council noted in its submission that is investigating the viability of a range of sewer mining technologies but has not yet developed any firm proposals[57]. Hunter Water noted that it has limited experience with sewer mining to date, but has been a party to sewer mining proposals from time to time.[58]

Clearly, sewer mining is likely to feature more prominently among future recycled water projects in the context of long term plans to balance supply and demand. In addition, sewer mining may be one element of broader proposals by third parties to sell recycled water to other customers – potentially in competition with existing water agencies[59].

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54 IPART (2006), *Recycled Water Prices for Sydney Water Corporation, Hunter Water Corporation, Gosford City Council and Wyong City Council - Issues Paper.*

55 Sydney Water Corporation (2006), *How to establish a sewer mining operation* www.sydneywater.com.au

56 Gosford City Council submission, p 4.

57 Wyong City Council submission, p 6.

58 Hunter Water submission, p 18.

59 See the Tribunal's report, *Investigation into Water and Wastewater Service Provision in the Greater Sydney Region (2005)*. It is important to note however that the third party access regime will not in itself provide a right to obtain a resource (such as sewage for recycling).

The Tribunal has the legal power to regulate the price that government-owned water agencies may charge third parties for sewer mining. In its 2003 metropolitan water price determination,[60] the Tribunal set the maximum price for taking sewage at zero. Sydney Water was required to provide access to the sewer for extractive purposes on the basis that it only recovered the incremental cost of making access to its sewers available. The Tribunal remained silent on this matter in its determinations of September 2005, pending this review of recycled water prices.

The Tribunal's draft decisions in relation to prices for sewer mining are summarised in the section below. The subsequent sections explain these decisions in more detail, including the Tribunal's considerations on the form of regulation, its proposed pricing principles, how these principles will be applied, and its proposal for arbitrating disputes.

9.1 Overview of Tribunal's draft decisions in relation to prices for sewer mining

The Tribunal's draft decision is not to make a price determination for sewer mining. The terms and conditions of sewer mining agreements are to be negotiated between the parties.

The Tribunal also recommends that its arbitration powers be extended to cover disputes between water agencies and sewer miners over sewer mining arrangements.

9.2 Tribunal's proposed approach for sewer mining

As for mandated recycled water schemes and voluntary recycled water customers, when deciding whether to regulate prices for sewer mining the key criterion is whether the service is subject to market power sufficient to justify regulatory intervention.

Clearly, by virtue of ownership of the sewerage network and effective control over the sewage being transported through it, the incumbent water agencies have the ability (and in some cases a potential incentive) to frustrate or prevent sewer mining proposals. However, the extent of this market power is constrained by the obligation for water agencies to provide potable water at a regulated price. In addition, the NSW Government is in the process of developing an access and licensing regime for firms that wish to engage in sewer mining. These measures, coupled with the existing pricing policies of allowing sewer miners to take effluent for zero price, should be sufficient to protect the interests of potential entrants.

In the final report on its investigation into water and wastewater service provision in the Greater Sydney region,[61] the Tribunal indicated its support for access-based competition in the water and sewerage industry. Under access-based competitive arrangements the Tribunal indicated that it envisaged new entrants covering all costs associated with their proposed schemes, including retail costs associated with introducing competition.

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

61 IPART (2005), *Investigation into Water and Wastewater Service Provision in the Greater Sydney Region.*

In relation to sewer mining specifically, Sydney Water has recently released a Sewer Mining policy.[62] Under this policy, Sydney Water has indicated that it will seek no financial gain from enabling sewer mining. However, to avoid losses, it proposes to recover all costs incurred to enable the sewer mining connection and its operation. It will also recognise any financial savings realised from the sewer mining operation and reflect those in the costs to be recovered. It does not propose to charge for the sewage extracted once a sewer mining facility is operational.

Given these factors, the Tribunal has decided not to make a price determination for sewer mining. The Tribunal considers that prices between incumbent water authorities and new entrants interested in sewer mining should be negotiated directly between the parties.

9.3 Arbitration

The Tribunal has previously recommended that formal dispute resolution procedures relating to sewer mining be established, with a right to seek arbitration through the Tribunal, as part of broader reforms to the regulatory framework to facilitate private sector participation in the industry[63].

Sydney Water's sewer mining guidelines already state that disputes between Sydney Water and prospective sewer miners can be referred to the Tribunal for independent dispute resolution and arbitration.[64]

A number of changes have already been foreshadowed to the regulatory framework governing these and other schemes.[65] This includes a proposed role for the Tribunal in arbitrating disputes over third party access under the state-based access regime. The Tribunal supports this proposal, and recommends that its arbitration powers be extended to cover disputes over sewer mining.

62 Sydney Water, *Sewer mining: How to establish a sewer mining operation*, May 2006.

63 IPART, *Investigation into Water and Wastewater Service Provision in the Greater Sydney Region – Final Report*, October 2005, p 18.

64 Sydney Water, *Sewer mining: How to establish a sewer mining operation,* May 2006, p 8.

65 See Metropolitan Water Directorate, Cabinet Office (May 2006), *Consultation paper: Creating a dynamic and competitive metropolitan water industry.*

10 LOOKING FORWARD

This draft report sets out the Tribunal's proposed pricing framework for recycled water and sewer mining services provided by the four water agencies.

In developing its approach, the Tribunal has recognised that the market for recycled water is at an early stage. It has deliberately adopted a relatively 'light-handed' approach so as not to inhibit the development of this market, particularly where users have countervailing power in dealing with suppliers. At the same time, the Tribunal has sought to provide greater certainty to the agencies, users, and potential private entrants and to ensure appropriate protection for users from the exercise of monopoly power.

The Tribunal intends to monitor these arrangements. If it finds that they are not achieving the desired objectives, it may modify its approach.

The Tribunal has also sought to adopt an approach that is consistent with and supports the concurrent developments in the industry, particularly in relation to facilitation of greater private sector participation. While the regulatory arrangements proposed in this report apply at present only to the four water agencies over which the Tribunal has jurisdiction, in future it is envisaged that its power to regulate prices extend to any private suppliers where services are provided under conditions of monopoly power.

Related amendments foreshadowed to the Tribunal's powers stemming from the recent broader industry review include its proposed roles and responsibilities under the third party access regime being developed by the NSW Government, and the power to arbitrate disputes over sewer mining.

This review has also highlighted the interrelationships between recycled water and potable water and sewerage services and the need to examine costs and prices of these services and associated investments as part of an integrated supply system. The Tribunal therefore proposes to integrate recycled water into its next periodic review process for potable water and sewerage prices.

APPENDIX A MATTERS TO BE CONSIDERED BY THE TRIBUNAL UNDER SECTION 15 OF IPART ACT

The Tribunal's decisions have been made in accordance with the requirements set out in the IPART Act, including the factors contained in Section 15 of the Act. This section, which is reproduced in full in Box A1, specifies the matters the Tribunal must consider when making a determination. The Tribunal is satisfied that its determination achieves a reasonable balance between these matters.

Box A1 Matters to be considered by Tribunal under Section 15 of the IPART Act

(1) In making determinations and recommendations under this Act, the Tribunal is to have regard to the following matters (in addition to any other matters the Tribunal considers relevant):

(a) the cost of providing the services concerned,

(b) the protection of consumers from abuses of monopoly power in terms of prices, pricing policies and standard of services,

(c) the appropriate rate of return on public sector assets, including appropriate payment of dividends to the Government for the benefit of the people of New South Wales,

(d) the effect on general price inflation over the medium term,

(e) the need for greater efficiency in the supply of services so as to reduce costs for the benefit of consumers and taxpayers,

(f) the need to maintain ecologically sustainable development (within the meaning of section 6 of the Protection of the Environment Administration Act 1991) by appropriate pricing policies that take account of all the feasible options available to protect the environment,

(g) the impact on pricing policies of borrowing, capital and dividend requirements of the government agency concerned and, in particular, the impact of any need to renew or increase relevant assets,

(h) the impact on pricing policies of any arrangements that the government agency concerned has entered into for the exercise of its functions by some other person or body,

(i) the need to promote competition in the supply of the services concerned,

(j) considerations of demand management (including levels of demand) and least cost planning,

(k) the social impact of the determinations and recommendations,

(l) standards of quality, reliability and safety of the services concerned (whether those standards are specified by legislation, agreement or otherwise).

(2) In any report of a determination or recommendation made by the Tribunal under this Act, the Tribunal must indicate what regard it has had to the matters set out in subsection (1) in reaching that determination or recommendation.

Table A1.1 indicates where the matters have been considered throughout the report by the Tribunal in making this determination.

Table A1.1 Consideration of Section 15 matters by Tribunal for Rouse Hill recycled water price determination

Section 15(1)	Report reference
(a) cost of providing the service	Sections 6.8, and Chapter 4
(b) protection of consumers from abuse of monopoly power	Sections 3.4, 3.5, 6.5, 7.2, 8.2, 9.2
(c) appropriate rate of return and dividends	Section 6.5, Section 5.7 Appendix B
(d) effect on general price inflation	Not applicable
(e) improved efficiency in supply of services	Sections 3.1, 3.2, 3.4, 4.1, 4.3, 6.7.
(f) ecologically sustainable development	Chapter 2, Chapter 4 and section 6.5
(g) impact on borrowing, capital and dividend requirements	Not applicable
(h) additional pricing policies	Not applicable
(i) need to promote competition	Section 2.2, Chapter 9
(j) considerations of demand management	Chapter 2 and 4 generally
(k) the social impact on customers	Section 6.5
(l) standards of quality, reliability and safety of the services	Section 6.5

APPENDIX B THE EXISTING FRAMEWORK FOR PRICING WATER AND SEWERAGE SERVICES

The Tribunal currently sets water prices so that the metropolitan water agencies recover the efficient costs of providing water, sewerage and some stormwater services. These costs are recovered through a combination of periodic fixed and variable usage charges levied on customers and up-front charges levied on developers.

To date, the Tribunal has adopted a uniform or 'postage stamp' pricing approach for water and sewerage periodic charges in each agency's area of operations. This means that all customers within each customer class are charged the same price for each service, even though the costs of delivering services vary across the supply network (depending on factors such as distance from headworks or treatment facilities).[66]

In a recent consultation paper, *Creating a Dynamic and Competitive Metropolitan Water Industry* the NSW Government stated that it remains committed to postage stamp pricing for essential services. It considers that all consumers within the region serviced by the existing water agencies should, on social equity grounds, continue to be able to obtain essential water and sewerage services at 'postage stamp' prices.[67]

In 1996, the Tribunal set a methodology for determining water and sewerage developer charges. The methodology, which was reviewed in 2000, allows water agencies to recover costs associated with servicing new developments that are not recovered through periodic charges.

The Tribunal considers that pricing arrangements for recycled water and sewer mining must be consistent with maintaining the current approach to water and sewerage pricing. The key elements of this approach include establishing the agency's revenue requirement, setting periodic charges to recover this revenue, and setting developer charges to recover costs associated with servicing new developments. Each of these elements is outlined below.

Establishing the revenue requirement

One of the key steps in the Tribunal's price setting process is to establish each water agency's revenue requirement over the determination period, based on an analysis of the efficient operating and capital costs it needs to incur to provide appropriate levels of service to its customers. Prices are then set to generate this level of revenue from water, sewerage, stormwater and other miscellaneous services.

The Tribunal uses a cost 'building block' approach to establish the revenue requirement for each water agency. The cost blocks include:

- Operating and maintenance expenditure. This cost block represents the Tribunal's assessment of the agency's efficient level of operating and maintenance costs associated with providing regulated water services to the required standards.

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66 In 2000, the Tribunal accepted a proposal from Hunter Water Corporation to provide a small and variable discount to very large customers on water use above 50,000kL per annum, which reflected locational variation in the extent of delivery assets used by these customers. [IPART, *Sydney Water Corporation – Prices of Water Supply, Wastewater and Drainage Services from 1 July 2000.* September 2000].

67 Note that the paper does not clarify whether recycled water services are seen as "essential water and sewerage services" to which a postage stamp pricing policy should apply. However, discussions with the Metropolitan Water Directorate of Cabinet Office indicate that it was not the intention of Government that recycled water prices should be set on a postage stamp basis.

- Capital investment, which is based on two cost blocks:
  - An allowance for a return on capital (including working capital). This cost block represents the Tribunal's assessment of the opportunity cost of capital invested in the agency by its owner. It is derived by multiplying the value of the agency's regulatory asset base (RAB) by an appropriate rate of return.[68]
  - A return of capital (depreciation). This cost block represents the Tribunal's assessment of the agency's efficient level of costs in maintaining its asset base intact. It is calculated using straight-line depreciation on the RAB.

Under this approach, the capital invested in assets is recovered over the life of those assets. It can be shown that, for any asset, the present value of the annual stream of returns and depreciation over the life of the asset will equal the initial capital outlay.

Once the revenue requirement is established, the Tribunal allocates it across the agency's customer and service groups, including recycled water users. At present, each water agency has a single RAB that is used in determining the aggregate revenue requirement. That is, the agencies do not have a separate RAB for each of their main services (water, sewerage, and stormwater). However, capital and operating expenditure for each service is identified and assessed separately, and the total revenue requirement is allocated across water and sewerage customers to reflect the relative value of existing assets and new capital expenditure on each service.

The revenue requirement for each service is then used to set periodic charges designed to recover these costs over the regulatory period.

Setting periodic charges

Once the revenue requirement of an agency has been established for any year, the Tribunal sets the periodic charges for water, sewerage and stormwater services that it can levy on water users. For sewerage and stormwater services, most of the costs associated with these services are recovered through fixed annual charges[69] For water services, a significant portion of the costs is recovered through volumetric usage charges (that is, customers are charged a fee per kilolitre of water they consume) and the remainder is recovered through fixed annual charges.

Water usage charges are designed to provide a pricing signal about appropriate levels of water consumption. In its most recent determinations of water and sewerage prices for the metropolitan water agencies, the Tribunal aimed to set the level of the principal water usage tariff with reference to the Long Run Marginal Cost of water supply. For the purpose of determining the Long Run Marginal Cost the Average Increment Cost specification is used, as follows:

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68 The value of the RAB is established by 'rolling forward' the RAB used in making the current determination, to incorporate the agency's past capital expenditure that the Tribunal deems was prudent and its forecast capital expenditure that the Tribunal considers to be efficient (net of asset disposals and regulatory depreciation). At present, each water business has a single RAB that is used in determining the aggregate revenue requirement. The rate of return is established by using the Weighted Average Cost of Capital approach to determine a range for this rate, then making a judgement about what rate within the range is most appropriate, having regard to the matters in Section 15 of the IPART Act.

69 Hunter Water has a sewer usage charge based on water consumption discounted to reflect the volume discharged to the sewer and all agencies have sewer usage charges for non-residential customers.

$$AIC = \frac{PV\ (\text{least cost suite of water management options})}{PV\ (\text{incremental water demand associated with the suite of water management options})}$$[70]

The Tribunal established an increasing block tariff for Sydney Water, with the second tier price representing a mark up above marginal cost to aid in rationing water use to available supplies.

Annual fixed charges for water services are calculated as the residual revenue requirement not recovered through usage charges or developer charges (discussed below). Fixed water charges are calculated as a multiple of a base charge for a 20mm water meter to link the tariff to the demand on the system of different sized customers.

Setting developer charges

The water agencies also levy a one-off charge on developers to recover infrastructure costs associated with new developments. Water agencies are required to use the Tribunal's methodology to determine these charges. Under the methodology, developer charges are determined as the difference between the additional revenues expected to be generated by the development (based on ongoing fixed and usage tariffs) and the costs that are deemed to be attributable to the development (all measured in present value terms), as follows:

$$\text{DC per Lot} = \frac{PV\ (\text{Capital charge} - (\text{Periodic revenues} - \text{operating costs})}{PV\ (\text{Lots to be created})}$$

Developer charges provide a mechanism for water suppliers to recover above average incremental capital and operating costs in servicing new developments, and hence ensure full cost recovery from new (marginal) customers under a postage stamp pricing regime for services. Deducting allowance for future periodic revenues expected to be received from new customers in the development area each year effectively means that any incremental capital and operating costs above the average covered by periodic revenues is capitalised as an upfront payment.

Developer charges also serve a number of other functions. They signal to developers and homebuyers the cost of developing and locating in a particular area. This ensures that developers and homebuyers confront and pay the full cost of the infrastructure that needs to be put in place to enable them to have water and sewerage services in particular locations.

Developer charges also provide a useful source of cash flow for the water agencies, particularly in times of rapid and costly new development. Developer charges are collected over a much shorter timeframe than the life of the infrastructure put in place to serve the development. Developer charges also pass on to developers some of the risk associated with the cost of infrastructure provision.

When setting prices for water and sewerage, the Tribunal seeks to ensure full recovery of the costs incurred by water agencies from those using the services provided by the expenditure. This includes full cost recovery from incremental customers (i.e., those placing new demand on the system) regardless of whether they are located in new development areas or in redevelopments in existing areas.

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70 In this case the Present Value reflects a weighting of incremental output to reflect the marginal time preference of consumption.

APPENDIX C GUIDELINES FOR THE CALCULATION AND TREATMENT OF AVOIDED AND DEFERRED COSTS OF RECYCLED WATER

The Independent Pricing and Regulatory Tribunal of New South Wales (the Tribunal) has the power to regulate pricing arrangements for declared monopoly services provided by Sydney Water, Hunter Water, Gosford Council and Wyong Council under section 11 of the *Independent Pricing and Regulatory Tribunal Act 1992* (the IPART Act).

This Appendix sets out draft guidelines that provide a framework for the recovery of the costs of recycled water schemes by water agencies from both recycled water users and the broader customer base. The guidelines should be used in circumstances where a recycling scheme benefits water or sewerage customers by avoiding or deferring costs that would otherwise be incurred by these customers (eg, deferment of capital infrastructure upgrades or system augmentations in the water or sewerage networks to meet growth and/or comply with regulatory requirements).

Specifically, the guidelines propose that the total costs of a recycled water scheme should be shared between direct recycled water users and other water and/or sewerage users, with the contribution by the latter based on the amount of avoided or deferred costs generated by the scheme.

The Tribunal may update this guideline from time to time.

Purpose and scope of guideline

This guideline has been prepared to facilitate the calculation of avoided costs associated with recycled water and sewer mining for the purpose of establishing prices.

This guideline is limited to estimating avoided and deferred costs in the context of determining recycled water prices and for agency submissions to the Tribunal to recover costs of providing recycled water schemes from customers other than recycled water customers. The guideline does not consider assessment of avoided or deferred costs from the perspective of project feasibility, water supply planning or societal cost/benefit.

Definition and application of avoided cost calculation

For the purpose of this Guideline, deferred cost for a recycled water scheme is defined as the expected change in the present value of a water agency's operating costs and capital expenditure resulting from the temporary deferral of water supply augmentation, water or sewage treatment, or augmentation of water or sewerage systems. Where costs are expected to be deferred indefinitely the costs are said to be 'avoided'. It also includes costs avoided or deferred due to downsizing of water or sewage systems as a result of the recycled water scheme.

Avoided and deferred costs calculated using the guidelines should be deducted from the total cost of a recycled water or sewer mining scheme for the purposes of calculating prices.

If a water agency wishes to apply to the Tribunal, at the next water and sewerage price review, to recover part or all the avoided costs through water and sewerage periodic or developer charges, it will need to demonstrate that the avoided cost was calculated in accordance with this guideline.

Principles for calculating avoided/deferred costs

Calculation of avoided and deferred costs for the purpose of establishing prices for recycled water and sewer mining should be based on the following principles.

- Avoided/deferred costs represent the expected change in the present value of current and future capital and operating costs resulting from the recycled water or sewer mining scheme. The expected change in the present value is calculated by comparing the present values of expected capital expenditure and operating cost cashflows with and without the recycled water project (all other things being equal). All components of expenditure that will be affected by the scheme should be included.
- The estimates of capital expenditure and operating costs should be based on consistent water and sewerage system planning assumptions, probabilistic or deterministic standards including population growth and climate.
- The system-wide avoided costs should be determined by reference to the water agencies' Integrated Water Resource Plans (IWRPs). System wide avoided costs can be calculated by subtracting the cost of meeting a certain supply/demand outcome under the IWRP with a particular recycled scheme from the total cost of the IWRP without the recycled water scheme.
- The assumptions used to estimate costs (eg, performance standards, forecast demand etc) should be consistent between approaches. The Tribunal will require the water agencies to outline the underlying assumptions used in estimating avoided/deferred costs.
- Estimates of future capital and operating costs should be over a time period of 30 years, consistent with the time period used to calculate developer charges.
- Capital and operating expenditure should be taken into account but depreciation should be ignored.

Methodology for calculating avoided costs

The calculation of avoided costs should be based on the following methodology:

$$AC = NPV_r\,[K(without)_i + OC(without)_i - K(with)_i - OC(with)_i] \quad \text{for i years } 1,\ldots n,\ n \leq 30$$

Where:

- AC is avoided costs
- NPV is the Net Present Value discounted at rate r
- r is the Weighted Average Cost of Capital (WACC) applying to the current pricing determination
- $K(without)_i$ is the forecast capital expenditure for year i without undertaking the recycled water scheme
- $OC(without)_i$ is the forecast operating expenditure for year i without undertaking the recycled water scheme

- $K(with)_i$ is the forecast capital expenditure for year i with the recycled water scheme
- $OC(with)_i$ is the forecast operating expenditure for year i with the recycled water scheme.

Example 1: Avoided sewerage capital and operating expenditure

Calculation of avoided costs

Table 1 below illustrates the calculation of avoided costs associated with building a recycled water scheme. In this example future capital expenditure to upgrade an existing sewage treatment plant to meet higher environmental standards is avoided. In the absence of the recycled water scheme the cost of upgrading the sewage treatment plant would have been recovered through periodic sewerage charges.

Table 1 Avoided sewerage expenditure: calculating avoided costs

	FY	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Price determination period		t-3	t-2	t-1	t	t+1	t+2	t+3	t+4	t+5	t+6	t+7	t+8
1: CALCULATION OF AVOIDED COSTS													
Without recycled water scheme	$'000												
Wastewater capex			-	5,000	5,000	-	-	-	-	-	-	-	-
Wastewater operating costs			-	-	50	50	50	50	50	50	50	50	50
Total relevant cashflows			-	5,000	5,050	50	50	50	50	50	50	50	50
With recycled water scheme													
Wastewater capex			-	-	-	-	-	-	-	-	-	-	-
Wastewater operating costs			-	-	-	-	-	-	-	-	-	-	-
Total relevant cashflows			-	-	-	-	-	-	-	-	-	-	-
Calculation of avoided costs													
Difference in cashflows			-	5,000	5,050	50	50	50	50	50	50	50	50
PV of avoided wastewater scheme costs	**9,236**												

For clarity only years 1-12 are shown in the above table. But we assume in this example that the sewerage scheme costs are avoided indefinitely, or for a period of 30 years (ie, if the recycling scheme is implemented, no sewerage capital expenditure will be incurred and operating costs of $50,000 per annum will continue to be avoided in years 13-30). The net present value of costs the water agency will avoid is $9.236 million.

Impact on revenue requirement for recycled and sewerage customers

Assume that the recycled water scheme would entail capital and operating expenditures as shown in the Table 2 below.

The NPV of the total costs of the recycled water scheme is $55.7 million. Given that implementation of the recycled water scheme enables sewerage costs of $9.236 million to be avoided, this means that a maximum of this amount can be legitimately deducted from the cost to be recovered from recycled water customers.

This also means that $9.236 million or some 16.58 per cent of the costs of the scheme can be allocated to sewerage customers at the next water and sewerage price review if the Tribunal is satisfied that these costs are efficient and will actually be avoided, with the remaining 83.42% to be recovered from the users of the recycled water supplied by the scheme.

The impact on the revenue requirement to be recovered from recycled water and sewerage customers respectively over the life of the scheme is outlined below.

Table 2 Avoided sewerage expenditure: the impact on costs recovery

			2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Price determination period			t-3	t-2	t-1	t	t+1	t+2	t+3	t+4	t+5	t+6	t+7	t+8
2: Calculation of impact on RAB and revenue recovered from wastewater customers														
Direct costs of recycled water scheme		**NPVs**												
Recycled water scheme capex	$'000	**45,869**		-	30,000	20,000	3,000	-	-	-	-	-	-	-
Recycled water scheme opex	$'000	**9,839**		-	-	300	400	500	600	700	1,000	1,000	1,000	1,000
Total relevant cash flows	$'000	**55,708**		-	30,000	20,300	3,400	500	600	700	1,000	1,000	1,000	1,000
PV of avoided costs (to be recovered from wastewater customers)	$'000	**9,236**												
% of total costs of recycling scheme		**16.58%**												
PV of costs to be recovered from recycled water customers		**46,472**												
% of total costs of recycling scheme		**83.42%**												

Treatment of avoided costs to be recovered from sewerage customers

If the Tribunal allows avoided costs to be recovered via sewerage prices, the mechanism for allocating this portion of the cost to sewerage customers is initially via adjustments to the sewerage regulatory asset base (RAB). The avoided costs allowed for recovery from the broader customer base should be recovered from the customers that would have paid for them if the recycled water scheme was not built. In this case, the expenditure relates to a cost avoided by the agency's existing customers, and therefore should be ultimately recovered via periodic sewerage charges. In cases where avoided costs relate to growth expenditure, they will be recovered through developer charges.

Including avoided costs in the RAB and the developer charge in this way should ensure that the customers pay an amount equal to the benefits they receive.

All other things being equal the broader customer base will pay no more than the amount they would have paid had the recycled scheme not been implemented. That is, they will pay no more than the cost that would otherwise have been incurred to secure the system-wide benefits that will result from the recycling projects.

Example 2: Deferred water capital and operating expenditure

Calculation of avoided costs

Table 3 illustrates the calculation of avoided costs associated with a large customer currently taking potable water switching to recycled water. In this example, this switch allows a one-year deferral in the capital and operating expenditures associated with the water system upgrades that would otherwise be required. In net present value terms, this equates to a value of $0.951 million.

Table 3 Deferred water expenditure: calculating the cost offset

	FY	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Price determination period		t-3	t-2	t-1	t	t+1	t+2	t+3	t+4	t+5	t+6	t+7	t+8
1: CALCULATION OF AVOIDED COSTS (Deferral of water capital investment)													
Without customer switch to recycled water	$'000												
Water capex			-	4,000	4,000	4,000	-	-	-	-	4,000	4,000	4,000
Water operating costs			-	-	30	30	30	30	30	30	30	30	30
Total relevant cashflows			-	4,000	4,030	4,030	30	30	30	30	4,030	4,030	4,030
With customer switch to recycled water													
Water capex			-	-	4,000	4,000	4,000		-	-	-	4,000	4,000
Water operating costs			-	-	30	30	30	30	30	30	30	30	30
Total relevant cashflows			-	-	4,030	4,030	4,030	30	30	30	30	4,030	4,030
Calculation of avoided costs													
Difference in cashflows			-	4,000	-	-	- 4,000	-	-	-	4,000	-	-
PV of avoided water scheme costs	**951**												

Impact on revenue requirement for recycled and water customers

Assume that the recycled water scheme would entail up-front capital expenditure of approximately $3 million as shown in the Table 4 below.

Given that implementation of the recycled water scheme enables water costs with a net present value of $0.951 million to be deferred, this means that a maximum of this amount can be legitimately deducted from the cost to be recovered from recycled water customers.

This also means that some 32 per cent of the costs of the scheme can be allocated to water customers at the next water and sewerage price review if the Tribunal is satisfied that these costs are efficient, with the remaining 68 per cent to be recovered from the user of the recycled water supplied by the scheme.

The impact on the revenue requirement to be recovered from recycled water and water customers respectively over the life of the scheme is outlined below.

Table 4 Deferred water expenditure: the impact on costs recovery

	FY		2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Price determination period			t-3	t-2	t-1	t	t+1	t+2	t+3	t+4	t+5	t+6	t+7	t+8
2: Calculation of impact on RAB and revenue recovered from water customers														
Direct costs of recycled water scheme		**NPVs**												
Recycled water scheme capex	$'000	**2,670**		-	3,000			-	-	-	-	-	-	-
Recycled water scheme opex	$'000	**262**		-	-	40	40	40	40	40	40	40	40	40
Total relevant cash flows	$'000	**2,932**		-	3,000	40	40	40	40	40	40	40	40	40
PV of avoided costs (to be recovered from water customers)	$'000	**951**												
% of total costs of recycling scheme		**32.42%**												
PV of recycling scheme costs to be recovered from water customers		**1,981**												
% of total costs of recycling scheme		**67.58%**												

This treatment of deferred costs can have a significant impact on the costs and hence prices paid by recycled water users. In this case, assuming an annual demand of 470ML of recycled water a year by the large user, and recovery of costs over a 10 year period, the average price falls from around $1.12 to around 75c per kilolitre.

Treatment of avoided costs to be recovered from water customers

If the Tribunal allows these deferred costs to be recovered via water prices, the mechanism for allocating this portion of the cost to water customers is initially via adjustments to the water regulatory asset base (RAB). The deferred costs allowed for recovery from the broader customer base should be recovered from the customers that would have paid for them if the recycled water scheme was not built and the large user continued to take potable water.

Including an amount equal to the value of the deferred costs in the RAB in this way should ensure that the customers that are the recipients of the deferred costs from the recycling project pay an amount equal to the benefits they receive.

APPENDIX D SECTION 14A COMPLIANCE

In determining a methodology for fixing the maximum price for a monopoly service, the Tribunal must indicate what regard it has had to the matters set out in section 14A(2) of the IPART Act. The regard that the Tribunal has had to each of these matters when determining the methodology for recycled water developer charges is listed below.

Section of IPART Act	Reference in report
14A(2)(a) the agency's economic cost of production	The efficient cost of providing services to land developments is discussed in **sections 5.1, 5.2, 5.4 and 5.5**.
14A(2)(b) past, current or future expenditures in relation to the government monopoly service	The calculation of the charge requires the agency to include past and future assets and future net revenues and costs.
14A(2)(c) charges for other monopoly services provided by the government agency	The methodology involves an offset for future net revenues and costs from periodic charges arising from each development area. **Section 6.4** discusses this in relation to Rouse Hill.
14A(2)(d) economic parameters, such as: **(i) discount rates, or** **(ii) movements in a general price index (such as the Consumer Price Index), whether past or forecast**	**Section 5.8** discusses the appropriate discount rates for the four water agencies. The calculation of the charge is to be made in real terms and adjusted by the inflation rate.
14A(2)(e) a rate of return on the assets of the government agency	The discount rate for future assets has been determined with reference to the target rate of return considered in the review of periodic charges for each agency.
14A(2)(f) a valuation of the assets of the government agency	Agencies are required to include efficient costs only. Existing assets are to be valued on a MEERA basis. Yet to be constructed assets are to be valued on the basis of expected actual costs and on a MEERA basis at the next review.
14A(2)(g) the need to maintain ecologically sustainable development (within the meaning of section 6 of the Protection of the Environment Administration Act 1991) by appropriate pricing policies that take account of all the feasible options available to protect the environment	Appropriate charging through developer charges should signal the cost of developing in certain areas and therefore encourage more efficient resource use and better urban planning.
14A(2)(h) the need to promote competition in the supply of the service concerned	A commercial approach to service provision and economic regulation should give the agencies incentives to explore least cost options including contracting out. As well, developers may choose to provide some infrastructure themselves.
14A(2)(i) considerations of demand management (including levels of demand) and least cost planning	Recycled water developer charges are established within an integrated urban water system. The methodology makes provision for including avoided costs in developer charges. This is discussed in **Chapter 4** and **Section 5.6**