Submission to IPART's Review of Metropolitan Water Agency Prices

November 2004

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1 Introduction

The Sydney Catchment Authority (SCA) was established on 2 July 1999 as a statutory authority under the *Sydney Water Catchment Management Act 1998* (SWCM Act) with the objective of managing and protecting Sydney's water catchments and supplying Sydney with reliable bulk raw water. The SCA is directly responsible to the Minister for the Environment.

The SCA catchment areas cover over 16,000 square kilometres, extending from the north of Lithgow, south to the source of the Shoalhaven River near Cooma, and from the Woronora in the east to the source of the Wollondilly west of Goulburn.

The Independent Pricing and Regulatory Tribunal (IPART) established the initial price path for the SCA in September 2000. This price path set maximum prices the SCA could charge each year between 1 October 2000 and 30 June 2005. IPART reviewed the price path during 2003 to determine whether its 2000 determination remained appropriate in the light of SCA's operating experiences. It opted to continue the existing price path to 30 June 2005.

2 The Sydney Catchment Authority

2.1 The Sydney Water Catchment Management Act

The SWCM Act defines the roles, functions and objectives of the SCA.

The SWCM Act states that the roles of the SCA are to:

a) manage and protect the catchment areas and catchment infrastructure works

b) be a supplier of bulk water

c) regulate certain activities within or affecting the outer catchment area as well as the inner catchment area.

The SWCM Act also sets out the objectives of the SCA as:

a) ensuring that the catchment areas and the catchment infrastructure are managed and protected so as to promote water quality, the protection of public health and public safety, and the protection of the environment

b) ensuring that water supplied by the SCA complies with appropriate standards of quality

c) conducting activities in compliance with the principles of ecologically sustainable development where the SCA's activities affect the environment

d) managing the SCA's catchment infrastructure works efficiently and economically and in accordance with sound commercial principles.

2.2 Other Regulatory Instruments and Bodies

As a supplier of bulk raw water, the SCA is licensed by the Water Administration Ministerial Corporation. The SCA's water management licence was issued under the *Water Act 1912* on 23 April 2001. It was later modified following its public exhibition. This licence authorises the SCA's activities in relation to the extraction and use of water from identified water sources and in relation to water management works. This licence also specifies the quantity of water that must be made available for environmental and riparian purposes from SCA's dams.

The SCA's operating licence authorises the SCA to provide, construct, operate, manage and maintain systems and services in order to achieve its objectives.

The SWCM Act requires the SCA to enter into memoranda of understanding with its principal regulators. These memoranda of understanding establish the basis for co-operative relationships between the signatories and are included in the SCA's operating licence.

2.3 The SCA's Regulatory Role

The SCA regulates activities that are likely to impact on the supply of high quality bulk raw water to its customers. The SCA's regulation of access activities in the catchments is through the *Sydney Catchment Water Management (General) Regulation 2000*, which defines the powers of the SCA to protect special and controlled areas.

The *Sydney Water Catchment Management (Environment Protection) Regulation 2001* confers on the SCA the power to exercise certain functions under the *Protection of the Environment Operations Act 1997* in relation to non scheduled activities under that Act. These powers may be exercised for the purposes of protecting catchment areas or protecting and enhancing the quality of water in catchment areas.

The SCA also exercises concurrence and compliance functions. Concurrence approval of development and other roles defined under an environmental planning instrument allows the SCA to regulate development and activities planned and undertaken by other catchment users. These functions are currently defined by SEPP 58 and are further defined through the development of the draft Regional Plan, *Sustaining the Catchments – The Regional Plan for the drinking water catchments of Sydney and adjacent regional centres*. A revised version of the draft regional plan was released for public exhibition from 30 March to 31 July 2004.

A Direction under Section 117 of the *Environmental Planning and Assessment Act 1979* also

ensures that the SCA is consulted and has an opportunity to influence the making and amendment of local environmental plans.

2.4 Business Plan

The strategic direction of the SCA is prescribed in its Business Plan 2002-2007. (See Appendix B for details of the plan). The business plan outlines the SCA's vision, role and values, and comprises seven key result areas that focus effort on activities that make a difference in catchment health and managing the bulk water supply system.

The key result areas are:

- Threats to water quality minimised – *so that we continue to meet agreed water quality criteria in the short and long term*
- Sustainable and reliable water supply – *so that the security of supply is assured now and in the long term*
- Commercial success – *so that we achieve our statutory, commercial and contractual obligations*
- Building and sharing knowledge - *so that decision making by the SCA, other public authorities and the community is based on robust scientific, ecological, socio-economic and financial knowledge and information*
- Results through relationships – *so that we collaborate effectively and creatively with our partners, customers and the wider community*
- A dynamic and supportive workplace – *so that we are able to meet the challenges facing the organisation both now and in the future*
- Quality systems and processes – *so that we get it right the first time*

Each key result area has clearly identified intended outcomes, supporting strategies and performance indicators and targets. These are the outcomes sought by the SCA Board, and form the fundamental drivers for allocation of resources – both human and financial. Responsibility for delivery of strategies within the business plan is assigned to appropriate division/s.

The business plan is reviewed annually to ensure that the plan continues to provide the appropriate focus for the SCA's efforts and to facilitate development and implementation of associated annual divisional and section work plans and budgets. It is intended to undertake a comprehensive mid-term review of the business plan during the second quarter of 2004-05.

2.5 Organisational Structure

The SCA Board's functions are to:

- determine the policies and long term strategic plans of the SCA
- endeavour to ensure that the SCA meets all public health and environmental requirements set out in its Operating Licence and other relevant instruments
- oversee the effective, efficient and economical management of the SCA; and report on the activities and performance of the SCA.

The Board consists of nine members, including the Chief Executive and Managing Director. The SWCM Act requires the Board to include a nominee of the NSW Farmers' Association and of the Nature Conservation Council of New South Wales and a local government representative. In addition to these, other members of the Board must each, or together, have expertise in the areas of protection of the environment and public health, and other expertise as the Minister considers necessary to realise the objectives of the SCA.

The Act provides for the appointment of a Chief Executive with the role of managing and controlling the affairs of the SCA in accordance with the policies determined by the Board. The Chief Executive is subject to any directions of the Minister under the Act. Practical day-to-day management of the SCA is by the Managing Director.

The Chief Executive and Managing Director are assisted in their tasks by an executive staff of seven who report directly to the Managing Director. The roles of the functional business areas led by these executives are:

- **Bulk Water** – The Bulk Water Division is responsible for the management and operations of the SCA's dams, storages and transport infrastructure, and to supply agreed quantities of quality water to customers. The delivery of quality bulk water is achieved through strategies aimed at securing the bulk water supply; delivering both the quantity and quality of bulk water required by customers through storage operation; and ensuring the integrity of the SCA's assets through asset management and maintenance programs, and risk and resource management.
- **Catchment Operations and Major Projects** – The Catchment Operations and Major Projects (COMP) Division is responsible for care, control and management of the catchment areas. This involves working with the community, other government agencies, local councils, industry bodies, environment groups and landholders to cooperatively manage and protect the catchments. It does this through delivery of the SCA Healthy Catchments Program. The division is also primarily responsible for regulatory enforcement via the environmental and general regulations under the SWCM Act.
- **Environment and Planning** – The Environment and Planning (E&P) Division is responsible for the SCA's land use planning activities, and its science and research, and education and public affairs functions. The division provides specialist services in relation to the protection of catchment and downstream riverine environments. It also manages the SCA's input to periodic catchment audits and is responsible for managing the implementation of audit recommendations.
- **Dam Safety** – The Dam Safety Division offers specialist services in all aspects of dam safety and surveillance, mine subsidence, vibration investigations and earthquake monitoring of the SCA's infrastructure, catchments and storages as well as servicing Sydney Water Corporation and a number of external clients.
- **Policy and Governance** – The Policy and Governance Division provides executive support to the Board, CEO and Managing Director as well as managing compliance, policy development, corporate governance, and providing economic advice. The division prepares and negotiates the annual Statement of Financial Framework on behalf of the Board.
- **Corporate and Property Service** – Corporate and Property Services (C&PS) Division provides and co-ordinates a range of services across the SCA including information technology, human resource management, property and accommodation services and office management. This group is also responsible for anchoring the SCA's business planning activities and its risk and incident management planning and preparedness.
- **Finance and Procurement** – This division oversees the provision of financial monitoring and reporting services to the SCA. It is responsible for managing externally sourced treasury management functions. The division also provides contract administration services and procurement advisory services on behalf of the SCA.
- **Legal Services** are provided directly to the Managing Director and the Board.

3 Managing the Bulk Raw Water Supply

3.1 The SCA's Water Supply System

The SCA's bulk raw water supply system comprises the catchments of four major river systems: Warragamba, Upper Nepean, Woronora and Shoalhaven. These catchments extend over 16,000 square kilometres and surround the Sydney Greater Metropolitan Region. The SCA also buys water from the Fish River Scheme.

In total the SCA manages fifteen major water supply storages with a combined operating storage of 2,386,000 megalitres. The yield of these catchments, consistent with meeting the system performance criteria set out in the SCA's operating licence, is 600 gigalitres per year.

3.1.1 The Warragamba Catchment

Warragamba Dam stores water collected from the Warragamba catchment. The catchment extends over 9,050 square kilometres and includes the regional centres of Goulburn, Moss Vale, Mittagong and Lithgow. Warragamba Dam forms a 75 square kilometre lake with 354 kilometres of foreshore. It is the largest dam in the SCA's supply system and the largest urban supply concrete dam in Australia. It is capable of holding over 2,057,000 megalitres of water and has an operating storage of 1,886,000 megalitres, or almost four times the capacity of Sydney Harbour.

Warragamba Dam supplies over 80 per cent of Sydney's drinking water needs. This supply is delivered by gravity via pipelines to the Prospect Water Filtration Plant. *En route* to Prospect, water is drawn off for supply to Sydney Water's Orchard Hills Water Filtration Plant. Penrith, Emu Plains and the lower Blue Mountains are supplied from this plant.

The delivery of quality bulk raw water to Sydney Water at Prospect is at the maximum rate of flow of 2,600 megalitres per day.

3.1.2 The Upper Nepean Catchment

Four dams are located within the Upper Nepean (Metropolitan) catchment - Cataract, Cordeaux, Avon and Nepean dams. Water drains to these dams from a total catchment area of approximately 900 square kilometres.

Water is diverted to Sydney from the Upper Nepean dams via a transfer system which comprises natural river channels, diversion weirs and an open canal. Flows can be diverted from the Nepean, Avon and Cordeaux dams via run-of-river flows to Pheasants Nest Weir on the Nepean River and then diverted to Broughtons Pass via the Nepean Tunnel. Flows from the Cataract Dam are also diverted to Broughtons Pass via run-of-river flows on the Cataract River.

The weir at Broughtons Pass diverts the flow from the Upper Nepean dams through a series of tunnels, aqueducts and open channels (collectively known as the Upper Canal) to the Prospect Water Filtration Plant. The Upper Canal has a maximum transfer capacity of 680 megalitres per day.

The SCA currently uses the Avon Dam exclusively for supply to the Illawarra. A pipeline beneath the Illawarra escarpment conveys water by gravity from the upper reaches of the Avon Dam to Sydney Water's Illawarra Water Filtration Plant at Kembla Grange.

3.1.3 The Woronora Catchment

The Woronora catchment covers an area of approximately 75 square kilometres that drains to Woronora Dam. The dam has a total operating storage of 71,800 megalitres.

Water supplies from the Woronora Dam are treated at the Woronora Water Filtration Plant before distribution to Sydney Water's customers via the Woronora and Helensburgh pipelines. While some areas supplied from Woronora Dam can be supplemented from the Prospect Water Filtration Plant, the Woronora system is the sole source of supply to a number of areas within the Sutherland Shire to Sydney's south.

3.1.4 The Shoalhaven Catchment

The Shoalhaven system is currently used to supplement Sydney's supplies during droughts. This system comprises three storages: Tallowa Dam, Fitzroy Falls Reservoir and Wingecarribee Reservoir (which is within the Warragamba catchment). These are situated about 160 kilometres south of Sydney.

Tallowa Dam, on the confluence of the Shoalhaven and Kangaroo rivers, impounds water in Lake Yarrunga. Lake Yarrunga has an operating storage of 35,300 megalitres obtained from a 5,750 square kilometre catchment area and is the principal storage.

Fitzroy Falls Reservoir has an operating storage of 10,000 megalitres. It has a catchment of 31 square kilometres but the main source of its water is from Lake Yarrunga. This water is diverted to the Sydney supply system via a series of pumping stations, pipes and pondages. Water from Lake Yarrunga is pumped over 612 metres to Fitzroy Falls Reservoir where it is then transferred by canal, pumping station and tunnel to the Wingecarribee Storage. Water from Fitzroy Falls Reservoir is also supplied to Shoalhaven Council for supply to the Kangaroo Valley.

Wingecarribee Reservoir is the terminal transfer reservoir of the Shoalhaven System and distributes water pumped from Lake Yarrunga and Fitzroy Falls Reservoir to Lake Burragorang (Warragamba Dam) and Nepean Reservoir during periods of drought. It also supplies water for local supply by Wingecarribee Council. It has an operating storage of 33,500 megalitres and a catchment of 40 square kilometres.

Supplies from the Shoalhaven catchment may be used to augment either the Warragamba or the Upper Nepean dams. Water can be diverted from the Shoalhaven catchment to Warragamba Dam via the Wingecarribee and Wollondilly rivers and/or to the Upper Nepean dams via Glenquarry Cut and pipeline. From the Nepean Dam, water can be transferred to Prospect Water Filtration Plant via the Pheasants Nests/Upper Canal transfer system, or to Avon Dam to supplement Illawarra supplies via the Nepean-Avon Tunnel.

3.1.5 Blue Mountains Water Storages

Water supplies to the Upper Blue Mountains are harvested from five water storages: Medlow Dam, Greaves Creek Dam and Cascades Dams (1, 2 and 3). These storages are located in the Blackheath and Katoomba Special Areas respectively and are all located on tributaries of the Grose River. The Blue Mountains storages have a total catchment area of 12 square kilometres and operating storage capacities of approximately 2,790 megalitres.

The Upper Blue Mountains (i.e. above Springwood) is supplied by pumping from these five small storages. Supplies in the Upper Blue Mountains storages can be augmented from an entitlement in Lake Oberon under the Fish River Water Supply Agreement. Water from these sources is treated by Sydney Water in the Cascades or Greaves Creek water treatment plants prior to distribution to its customers.

3.1.6 Prospect Reservoir

Prospect Reservoir was built in 1888 as a major holding basin for Sydney's water supply until Cataract Dam was completed in 1907. Today it is an off-line storage which can be drawn on to supplement the Warragamba Pipeline and Upper Canal flows or as an emergency supply.

3.2 Long Term Water Supply Planning

Long term water supply planning is critical to the SCA delivering a sustainable and reliable water supply. Population growth, climate change and river health are three significant factors impacting on the quantity of water necessary to meet the long term demands of the people of Sydney, Illawarra and the Blue Mountains.

The current yield for the SCA's system is 600 gigalitres per annum. If this yield is exceeded (as it was from 1999 to 2003) then the security of the system is reduced and the likelihood and duration of restrictions are increased. Climate change is also expected to affect the yield over the long term and it has been estimated that this impact will equate to a gradual reduction in yield of around 1 gigalitre per annum.

3.2.1 Metropolitan Water Plan and its implications for supply

The Metropolitan Water Plan, *Meeting the challenges – Securing Sydney's water future*, outlines the government's plans for a sustainable and secure water system over the next 25 years. It establishes a way forward with a range of initiatives to reduce demand, increase water supplies, recycle and protect the environment.

The NSW Government as part of its Metropolitan Water Plan is implementing a demand management program that will see the water consumed on a per capita basis fall from the current figure of 426 litres/person/day.

As illustrated in Table 1, Sydney Water's demand targets are below the current yield and if these targets are met, the SCA would not need any increases in yield for a number of years. For consistency the SCA has based its submission on these demand projections, however, because these figures are targets, their use by the SCA for planning purposes could result in a shortfall of water should they not be achieved.

Table 1 – Sydney Water Demand Projections

(GL)	2004-05	2005-06	2006-07	2007-08	2008-09	2009-10
Sydney Water	558	587	579	569	557	551
Other	4.1	4.1	4.1	4.1	4.1	4.1

The supply strategies identified in the Metropolitan Water Plan mean that the SCA will increase the yield by implementing a number of projects to augment and improve access to existing supplies. These projects involve accessing deep water (i.e. the water that lies below the current dam outlets) and Shoalhaven pumping (transferring water from Tallowa Dam, which currently only occurs in periods of drought). Investigations into the use of groundwater as a contingency supply during drought may also improve the yield. The SCA is also negotiating to increase the amount of water it purchases from the Fish River Scheme. Details of these initiatives can be found in section 5 of this paper.

The Metropolitan Water Plan commits the SCA to the largest infrastructure projects in the organisation's five year history, and the most significant augmentation of the Sydney bulk water supply system since the 1970s.

The SCA's other core function is minimising threats to water quality.

3.3 Catchment Operations

In its issues paper IPART stated that a key agency matter for it to consider in the current review is the efficiency and effectiveness of the SCA's management of the hydrological catchment that supplies Sydney's drinking water and the optimum level of revenue required by the SCA for its activities, particularly catchment management activities. Set out below is a detailed response.

Protecting the catchments is a continuing process. The SCA manages the catchments for raw drinking water quality outcomes. Its water quality monitoring programs and planning focus on identifying potential polluting events and being prepared to prevent or respond to them. The SCA, as a manager of the entire hydrological catchment has the capacity to predict; monitor and control changes in the catchment and address them in order to avoid or minimise any impact on the water storages.

The protection of Sydney's raw drinking water supplies is achieved through the adoption of a multiple barrier approach. This involves:

- protecting the quality of waters entering the storages by monitoring and influencing activities occurring in the catchments

- improving the quality of waters entering the storages through the protection and management of inner catchment lands (special areas) surrounding the storages
- optimising manipulation and management of its storages
- having extensive and comprehensive water quality and quantity monitoring networks

The catchment area is a dynamic and productive part of Sydney's natural environs as well as providing its drinking water. The management of new development, current human activities and the remediation of historical land degradation are all essential components of the SCA's multiple barrier approach. The growth of this region will place added pressures on the catchment and its ability to provide high quality water.

Activities in the outer catchments present the potential to adversely affect water quality through inflows of pollutants from point sources, such as sewerage system discharges, and from diffuse sources such as agricultural run-off and urban development.

The protection of water quality from impacts arising from activities in the outer catchments, and land under private ownership in the special areas requires a full suite of regulatory and incentive tools to affect change and influence development in the catchment. These include controls on land use planning, assessment tools for new development, rectification action planning and catchment improvement works.

Other strategies are focussed on influencing activities in these areas through regulatory mechanisms, funding of works or educating the community, often in collaboration with other stakeholders.

3.3.1 Managing the Inner Catchment Special Areas for Water Quality Protection

The SCA manages the 3700 square kilometres of inner catchment lands, which are proclaimed special areas. Together with the parks and reserves established under the *National Parks and Wildlife Act 1974*, they comprise an extensive, and largely contiguous, band of unspoilt bushland to Sydney's south and south-west. Some lands are managed jointly with the Department of Environment and Conservation's (DEC). The SCA funds DEC in its management of these lands. Activities that occur on these lands are subject to the SCA's direct regulatory control.

The SCA is committed to delivering water quality and land management outcomes within the special areas. In particular, access management and control, strategies for control of introduced plant pests and animals, fire management and planning, and exercising development control functions. Activities are largely funded by SCA and undertaken collaboratively with DEC and other government agencies and by private contractors.

With the exception of a number of localised activities, the inner catchment is largely in an undisturbed natural state. For example, the size of the Woronora and Upper Nepean catchments and the lack of suitability for agricultural activity mean that the entire hydrological catchment of the Woronora Dam and most of the Upper Nepean catchment has been preserved for water quality protection.

With regard to Warragamba, the size of the total catchment and pre-existing land uses meant that less than a third of the catchment was reserved for drinking water protection and declared as Water Supply Special Area. Most of the land in the Warragamba Special Area is owned and reserved under the *National Parks and Wildlife Act 1974*. Similarly, for the Shoalhaven, only 16 square kilometres of the total 5,750 square kilometre catchment (0.3 per cent), is declared as Water Supply Special Area.

The protection of the special areas has been principally managed through regulatory and land tenure and land use controls. Since the dams were built an exclusion policy (keeping sources of risk out) has operated. The SCA also has a continuing commitment to actively minimise potential sources of risk (eg. bushfire, erosion control, mine rehabilitation). Restricting access and minimising risk, limits pollutants from draining directly and quickly to the water storage.

Efforts to protect the special areas and water quality include:

- conducting awareness raising programs on the SCA's regulations and restricting access to the special areas via regulatory enforcement of provisions of SWCM (General) Regulation
- undertaking fire management activities to ensure that the effects of bushfire on water quality are minimised
- removing pests and weeds
- maintaining fire trails and undertaking soil conservation works
- promoting best management practices for land management
- advocating appropriate development and land management practices
- actively managing to protect the biodiversity, ecological integrity and the cultural values of the special areas.

3.3.2 Managing the Outer Catchment for Raw Drinking Water Quality Protection

The outer catchments pose a greater risk for pollution of the water storages. Management of the outer catchments is a key priority for the SCA and critical to ensuring water quality and protecting public health.

A range of land uses exist within the Warragamba and Shoalhaven hydrological catchments including residential development, urban centres, small-lot rural subdivisions, a range of intensive agricultural activities (predominantly livestock, vegetable growing and poultry farming), coal mining, forestry, public roads, and utility easements. There are some 110,000 people with livestock including 15,000 sheep, 162,000 cattle, 39,000 pigs and 3 million chickens.

The SCA's approach to protecting raw drinking water quality in the catchment is based on:

- Preventing risks to raw drinking water quality
- Minimising the impacts of new development and current activities on raw drinking water quality
- Improving water quality during specific events such as heavy rainfall and improving overall catchment health
- Repairing historical impacts on water quality such as erosion, river degradation and land clearing.

These approaches are discussed in detail in sections 3.3.3 to 3.3.10. Some of these approaches are also used to manage the inner catchments.

3.3.3 Water Quality Risk Management Framework

The SCA's Water Quality Risk Management Framework (WQRMF) identifies the priority pollutants for each bulk water supply catchment based on observations of water quality at water filtration plants and other key locations, and assesses any health or other implications. It also identifies the types of hazard events or land use activity linked with these pollutants.

The framework documented in Figure 1 Appendix A illustrates the linkages between priority pollutants and catchment activities and sources, and rigorous methodologies for the identification and implementation of appropriate responses. It shows the strategies and actions under broad functional areas addressing water quality risk factors on a priority basis. It shows both preventative measures and adaptive responses to current pressures, historic impacts and incident responses. These include rectification action priority and catchment improvements being implemented under the SCA's Healthy Catchments Program (HCP), land use planning activities designed to manage future development in order to avoid additional impacts on water quality. It also shows the relationship these activities have to storage and delivery management mechanisms, the Water Quality Risk Management Framework and incident management mechanisms that optimise the quality of water drawn from the storages.

3.3.4 Draft Regional Plan and development control

The draft Regional Plan *Sustaining the Catchments – the Regional Plan for the drinking catchments of Sydney and adjacent regional centres* requires the development of Rectification Action Plans (RAPs). The RAPs provide the geographic focus by assessing the relative significance of the hazards according to type and location. The RAPs provide a clear framework for action and funding to improve water quality at the sub-catchment level. The RAPs will be informed by the WQRMF, as well as strategic land and water capability assessments and other plans (such as those made by local councils or Catchment Management Authorities (CMAs)).

In addition RAP methodology includes the use of a decision support system to identify and rate drainage units in the catchment according to the frequency, or extent and seriousness of each pollutant source. This information is then available to identify the likely mitigations, rectifications or development controls for long term planning and prioritisation.

Included among the SCA's strategies to prevent and minimise risks to water quality is its role in assessing development proposals to ensure that development within the catchments has either a neutral or beneficial effect on water quality.

For example, the SCA assessed a proposed development of pastureland for wine-producing vineyards. The SCA examined the proposal's sediment and erosion controls and required conditions be imposed to ensure that pesticides and herbicides would not reach watercourses. On-site effluent disposal was also considered as part of the assessment. The SCA's role as manager of the hydrological catchment allows it to look at the 'big picture' impacts of proposed development on the quality of water in the storages, including issues that may cross local government boundaries.

3.3.5 Healthy Catchments Program

Using the priorities identified in WQRMF and the RAPs the SCA implements prioritised actions through the Healthy Catchments Program (HCP). The HCP is both an annual schedule of programmed and prioritised catchment improvement works, and an adaptive framework, which incorporates a wide range of project and program delivery mechanisms.

The majority of catchment operations expenditure is under the HCP. The 2004-05 budget is $17.2 million and includes an allowance of $4 million for the Accelerated Sewage Scheme.

The HCP has the capacity to readily extend existing programs, develop and rollout new catchment programs and monitor and report on catchment improvements in response to science and research outcomes or information identifying new priorities or risks.

The HCP also provides the main vehicle and interface with the programs of other government agencies and the Catchment Management Authorities (CMAs). This facilitates the identification of opportunities for integration and development of complementary programs and projects based on the respective priorities of each agency.

The current five-year program comprises seven major strategies:

- Catchment Information
- Sewage
- Riparian
- Rural lands
- Compliance
- Special Areas Strategic Plan of Management
- Stormwater

The strategies include actions to upgrade infrastructure, undertake revegetation works and promote recommended land management practices. These actions are implemented via grants and incentives, community/industry education and/or assistance programs and regulatory means.

The HCP develops appropriate remedial actions, from a range of options that are then delivered on the ground. The SCA might choose a regulatory solution such as environmental regulation, access control (special areas) or statutory planning powers, over the options of incentives and direct funding of catchment remediation works. The SCA may identify other stakeholders in the catchment with complementary programs where it may jointly secure water quality outcomes. Weed management and riparian management may be supported or progressed by other government agencies or community groups that can provide opportunities for collaborative projects.

As part of the HCP - SCA Lands program the SCA expects to spend $1.6 million for an intensive weed control program at the Wingecarribee Swamp. The structural failure of Wingecarribee Swamp in August 1998 caused widespread proliferation of *Salix cinerea* (Willow) and blackberries impacting on the sensitive ecology of the swamp and potentially on the water quality of the reservoir. A $1.2 million three-year weed control program was completed in June 2003. An intensive four-year $5 million weed control program aimed at eradicating or reducing infestations at the swamp to a sustainable level will commence during 2005.

3.3.6 Catchment Management Framework in Action

Appendix A, Figure 2 outlines the SCA Catchment Management Framework by process. This illustrates how the framework works in practice. Existing processes such as the WQRMF are used to identify priority pollutants for mitigation and/or control. The WQRMF and water quality monitoring results are used to identify and monitor the key pollutant sources and hazard events.

For example, following a long dry period, SCA's water quality monitoring network may show a repeated spike in *E. coli* entering a water storage dam after heavy rain. Analysis of the data identifies the stream or river carrying the contamination and SCA's catchment information system identifies all upstream tributaries, current land uses, vegetation coverage, soil and slope. The analysis then draws on the SCA's pollution source database and information from our compliance support system, which captures all previous inspections, regulatory and remedial actions and shows any proposed developments being considered by council or SCA. The most probable sources of contamination are identified along with current SCA, CMA or Council improvement programs operating in the subcatchment. This information is used to determine priority actions and appropriate responses to reduce the 'spike' in *E. coli* re-occurring after future rainfall events. It can also feed into the SCA's predictive tools and longer term rectification planning to verify assessments or refocus actions.

This response methodology utilises existing information and water quality monitoring results to progressively reduce/prevent specific identified risks to water quality.

A similar process is used to prevent pollution in future land use and activities with a Strategic Land and Water Capability Assessment (SLWCA). SLWCAs provide a practical and objective way to determine suitable land uses and any physical constraints to development. The SCA's use of concurrence power under SEPP 58 is then utilised for development assessment. The impact of sediment and the role of the SLWCA can be seen in Figure 2 where development control is used to minimise sediment from new development.

The SCA's bushfire management benefits from preventative, predictive and responsive action. This is illustrated in Appendix A, Figure 2. The SCA has bushfire management plans for all special area lands, Braidwood lands and land surrounding the Prospect Reservoir. The plans complement district bushfire management plans and identify hazard reduction programs (controlled burning and slashing). The SCA also responds to fire outbreaks as they occur; provides seasonal fire crews and funds the staffing of fire towers. The SCA is also conducting research into the impact of nutrients on post-fire water quality and investigating catastrophic events through the past 10 000 years to increase understanding of the likelihood and consequences of future fire events. This focus is only possible because the care and control of the catchment is so closely linked to the outcomes for the stored waters.

3.3.7 Working Collaboratively

The SCA is one of a number of landholders in the catchment, nearly 60% of the catchment is in private ownership, 25% is National Park, and 9% is owned or managed by the SCA. The remaining areas are crown lands, local government or state forest. So, the care and management of the catchment areas requires working with the community, other government agencies, local councils, industry bodies, environment groups and landholders to cooperatively manage and protect the catchments.

The SCA works in collaboration with other Government agencies and councils in identifying and mitigating pollution risks to achieve water quality outcomes. These include the DEC, in monitoring and responding to pollution incidents and breaches, the Department of Infrastructure Planning and Natural Resources and the new CMAs in collaborative natural resource programs aimed at improving water quality, such as the Catchment Protection Scheme, the Department of Energy Utilities and Sustainability in delivering the Accelerated Sewerage Program, (a funding program to accelerate the upgrade of sewage treatment infrastructure in the catchments under the Country Town Water Supply and Sewerage Program) and local councils in developing and implementing joint initiatives to achieve water quality outcomes.

The SCA also works collaboratively with catchment stakeholders. A number of devolved grants are managed by SCA to utilise other agencies' programs and opportunities. These include:

- **Joint Management of Special Areas** - SCA lands in the Warragamba, Blue Mountains and Shoalhaven special areas were transferred to the DEC in June 2002. As part of the $6 million committed annually by the SCA to joint management of all special areas, the SCA provides a $2.8 million annual grant to DEC for managing the special area lands transferred to it from the SCA in June 2002. This grant is escalated annually based on the appropriate Treasury Escalation Factor (2.6 per cent for 2003-04 and 2004-05). SCA expenditure in the transferred special areas in excess of the grant is being reduced with all future works in these areas to be funded from the grant.

  In addressing the Government's commitment to create a chain of national parks from the Queensland border to Victoria there is potential for DEC to purchases private lands within the special areas in the future and request funding contributions from the SCA.

  The SCA would assess these requests to ensure any contributions were consistent with the expected benefit of the protection of water quality.

- **Accelerated Sewage Program** - The SCA has committed $20 million over five years from 2002 to fast-track upgrades to aging sewage treatment plants in Sydney's water supply catchments. The Accelerated Sewage Program includes contributions to plant upgrades at Bowral, Robertson, Bundanoon, Kangaroo Valley, Goulburn, Taralga, Lithgow and Wallerawang. No amount was paid into the scheme by SCA in the 2004 but expenditure is expected to continue in 2005, 2006 and 2007, until the program is fully implemented.

- **Catchment Protection Scheme** - The SCA established a partnership with the Department of Infrastructure Planning and Natural Resources and has contributed $1.86 million since July 2001 to deliver the Catchment Protection Scheme. The program is designed to assist landholders carrying out erosion control and land management work, targeting sites that will have the greatest benefit to water quality. The annual commitment of $620,000 is planned to continue for the foreseeable future through new agreements with the Southern Rivers Catchment Management Authority and the Hawkesbury Nepean Catchment Management Authority.

3.3.8 Education

The SCA also works to achieve intended outcomes for catchment health and good water quality through education of the catchment community. The SCA's Education Strategy 2003-06 integrates education with a range of environmental management tools including

regulation, planning and incentives. It acknowledges that the SCA must build partnerships and community capacity to achieve its behavioural outcomes and move towards sustainability. The Strategy's aims include increasing the knowledge and improving the attitudes of the community to behave responsibly in ways that lead to more healthy catchments and better quality water. The SCA's education initiatives include educating local government staff and developers about the application of the neutral or beneficial effects test.

3.3.9 Science and Research

The SCA's Science and Research Program aims to improve understanding of water quality and catchment health. This process includes the assembly and interpretation of available technical material to inform decision making regarding planning, development and regulatory activity in the catchment. Specific research questions are investigated either directly or through consultants. Longer-term strategic research issues are studied through collaboration with external research partners.

The Science and Research Program includes a Collaborative Research Program which enables the SCA to work closely with leading researchers in universities and research organisations on key issues that affect water quality. Current collaborative projects are across a number of key areas including pathogens, nutrients and sediments, best management practices and climate forecasting.

The SCA is aware that methodologies for measuring the efficiency of catchment management activities are at early stages of development, and are not generally applied internationally. To fill this gap SCA is engaged in a major Collaborative Research Project with the Institute for Sustainable Futures to develop a least cost planning for water quality model. This project has the objective of allowing a ready comparison of the cost-effectiveness of alternative catchment management practices for given water quality outcomes. Like all SCA research projects this will be integrated into SCA decision making at the earliest opportunity, once validated. In conjunction with the RAP and other planning processes, this tool offers the opportunity for both targeted and cost-effective improvements in water quality in the catchment.

The SCA also works with and supports research institutions, educators and industry in national research programs. This includes working with the Cooperative Research Centre for Water Quality and Treatment and the Cooperative Research Centre for Freshwater Ecology. As an example a project on source water protection details the processes of catchment risk management as a tool to secure source water protection; such information can directly assist the SCA in managing the catchments and water storages to maintain water quality.

3.3.10 Monitoring Water Quality and Catchment Health outcomes

The SCA's catchment management activities are subject to monitoring and reporting through the annual state of the catchments report, Healthy Catchments Program reports and the SCA's water quality monitoring program.

The SWCM Act requires that a catchment audit of the state of the Sydney drinking water catchments area be undertaken every two years. This audit provides a snapshot of the health of the catchment. The primary purpose of the audit is to provide guidance for the management of Sydney drinking water catchment by reporting catchment health indicators and identifying trends (where data is available).

Catchment improvement actions delivered through the Healthy Catchments Program are monitored and evaluated through the Catchment Audit.

The SCA also participates in an annual audit of compliance with its operating licence. The SCA reports annually on the outcomes of its water quality monitoring program and its Environment Plan, which includes reporting against its environmental and ecological sustainable development indicators.

The outcomes and deliverables of the HCP link to the catchment audit outcomes and other performance reporting and review systems, to ensure that the SCA demonstrates the

efficiency and effectiveness of its catchment programs.

The HCP provides the capacity to readily extend existing programs, develop and rollout new catchment programs and monitor and report on catchment improvements in response to science and research outcomes or information identifying new priorities or risks. The business plan reflects any changing priorities identified by new science information, opportunities for partnerships or changes in the catchment. Most importantly, the SCA closes the loop by monitoring and measuring the success of its strategies ensuring they deliver the intended outcomes.

4 Review of Existing Price Path

The following section reviews the SCA's business outcomes between 2000-01 and 2004-05 under the current five-year price path determined in September 2000.

4.1 Water Supplied

The Sydney Catchment Authority provides water to:

- Sydney Water Corporation for treatment and reticulation to the four million people of the Sydney, Illawarra and the Blue Mountains regions
- Wingecarribee Shire and Shoalhaven City councils for treatment and reticulation to their customers
- About 60 smaller users of water who use bulk raw water for household, stock and irrigation purposes as well as firms engaged in primary production and industrial activities located in close proximity to water transport conduits or water storages or streams.

The SCA's smaller users obtain water from different parts of the water supply system including the water storages and impoundments, Warragamba Pipelines and the Upper Canal.

Water supplied to the various customer classes is set out in Table 2.

Table 2 – Actual Water Supplied

Customer (ML)	1999-00	2000-01	2001-02	2002-03	2003-04
Sydney Water	602,769	626,672	625,378	631,395	555,649
Wingecarribee Shire Council	3,384	3,487	3,406	4,186	3,442
Shoalhaven City Council	71	79	82	91	85
Other raw water users	47	82	31	33	90
Other Unfiltered water users	255	255	312	311	304
Total	**606,526**	**630,575**	**629,209**	**636,014**	**559,569**

Table 2 shows that the councils and other customers of the SCA consume less than 1 per cent of the annual total water demand placed on the SCA.

4.1.1 Sydney Water

Sydney Water is by far the SCA's largest customer. IPART's pricing determination of September 2000 and mid term review of March 2003 were based on certain forecast sales of water by the SCA to Sydney Water. These are set out in Table 3.

Table 3 – Sales to Sydney Water

Year (GL)	Estimated Water Demand	Cumulative Estimated Demand	Actual Water Demand	Cumulative Actual Demand
1999-00	595	595	603	603
2000-01	597	1,192	627	1,230
2001-02	593	1,785	625	1,855
2002-03	587	2,372	631	2,486
2003-04	602	2,974	556	3,042

The volumes of water sold to Sydney Water were higher than forecast up until 2003-04. Since 1998, the Sydney region has been in drought. To reduce demands on the water supply, voluntary restrictions were implemented for Sydney, Illawarra and the Blue Mountains on 14 November 2002. These restrictions consisted of limiting watering of gardens to between 8pm and 8am and prohibiting the hosing of hard surfaces.

Level 1 mandatory water restrictions were imposed on 1 October 2003, when the total storage for Sydney, Illawarra and the Blue Mountains had fallen to 59 per cent of full operating capacity. These restrictions banned the use of fixed sprinklers and watering systems and the hosing of hard surfaces, including vehicles. Continued dry conditions resulted in the introduction of Level 2 restrictions on 1 June 2004. These restrictions include the existing level 1 restrictions plus the restriction of garden watering to hand held hosing before 10am and after 4pm three days per week. As a consequence of these measures, water use in the 2003-04 year was much less than forecast.

4.2 Expenditure

4.2.1 Operating

At the 2003 mid term review IPART reviewed and adjusted the forward projections of the SCA's operating expenditure that had been made in 2000.

Table 4 – Operating Expenditure

($M)	2000-01	2001-02	2002-03	2003-04	2004-05
IPART 2000 Determination	**60.0**	**63.5**	*67.3*	*71.2*	*75.1*
IPART 2003 Mid-term Review			**75.6**	**78.0**	**79.4**
Actual	**57.8**	**73.5**	**80.2**	**76.4**	**79.2 (budget)**
Differences	(2.2)	10.0	4.6	(1.6)	(0.2)

Note: Figures include insurance costs

Table 4 shows that operating expenditures have been greater than the original provision made in 2000. In 2000 the SCA was still in its formative stages and the precise extent and scope of its activities were still largely unknown. By the time of the mid term review there was greater clarity about expenditure requirements. At the mid term review, IPART accepted that the SCA's forecast operating expenditure projections of $78 million in 2003-4 and $79.4 million in 2004-05 were reasonable. However, IPART considered it appropriate to place a ceiling on future increases in the SCA's operating expenditure.

In 2002-03 the SCA incurred one-off expenditure of $3.9 million for the implementation of an Integrated Management System and drought related pumping costs of $1.7 million for transferring water from the Shoalhaven River. In 2003-04 the SCA absorbed pumping costs of $6.3 million.

4.2.2 Capital

IPART allowed for $163.8 million of capital expenditure over 5 years in the 2000 pricing determination. A large component of this capital expenditure related to the Warragamba Spillway, which is intended to ensure the integrity of the dam wall in the event of a probable maximum flood. Capital expenditure outcomes against forecast are shown in Table 5.

Table 5 – Capital Expenditure

($M)	2000-01	2001-02	2002-03	2003-04	2004-05	Total
IPART 2000 Determination	45.8	52.6	35.9	14.8	14.7	163.8
IPART 2003 Mid Term Review	33.3	16.3	23.6	35.3	37.0	145.5
Actual	33.3	16.3	12.4	18.9	49 (Forecast)	129.9

Compared to the capital expenditure allowance in IPART's original determination, the SCA will spend approximately $34 million less over the five years to 30 June 2005. The majority of this underspend is attributable to contract savings from the Warragamba Spillway project although there are still significant amounts that are the subject of unresolved disputes with the contractor. Expenditure on major landscaping, a visitor's centre and modifications to spillway gates at Warragamba is yet to be incurred.

The SCA has a strong focus on asset management, with extensive documentation, systems and processes to ensure appropriate management of its critical water supply assets. It has completed a Failure Modes Effects Criticality Analysis (FMECA) of its water supply, electrical and mechanical assets and is completing a similar assessment of its civil assets and is currently assessing remaining assets. The FMECA is an internationally accepted process to identify potential failure modes for a product or process, to assess the risk associated with those failure modes, to rank the issues in terms of importance and to identify and carry out corrective actions to address the most serious concerns. Asset management has been developed and documented in line with the Government's Total Asset Management (TAM) requirements, and was confirmed as consistent with the principles of TAM in a review conducted by the then Department of Public Works and Services during 2003.

In addition, the SCA participated in an Asset Management Benchmarking exercise in early 2004, conducted by the Water Services Association of Australia.

The SCA has recently initiated a major internal project to review the Asset Management Framework and establish more transparent and comprehensive processes that extend across all assets under its control. This review will incorporate findings from the Water Supply Association of Australia (WSAA) benchmarking process and other opportunities for improvement. It will be timed to incorporate the outcomes of the Government's Metropolitan Water Plan, which has major implications for the scale and scope of the SCA's asset management strategies in both the short and long terms.

In the light of the processes outlined above, it may be necessary for the SCA to brief IPART further regarding the SCA's current approach to asset management and detail the review process discussed above.

4.3 Major Achievements during Current Price Path

The SCA has delivered services against the backdrop of continued drought and extreme bushfire seasons, both of which have had implications for the day-to-day work of the SCA. The SCA has managed to deliver on a wide range of programs as well as manage these critical issues. Some of the major achievements of the SCA over the term of the price path in relation to meeting its various objectives are listed below:

4.3.1 Bulk Water Supply

- Met or exceeded water quality compliance targets and provided an uninterrupted supply to customers over each of the four years
- Successfully completed $10 million upgrade of the Upper Canal

- Commenced upgrades to Warragamba Dam and electrical components, lifts, valves and crest crane. Periodic maintenance of Warragamba Dam radial gates has been carried out
- Refurbished 42 kilometres (of 52 kilometres) of the Warragamba Pipelines and cleaned and/or painted 18 kilometres of the Warragamba Pipelines. Security fencing has been upgraded and Warragamba pipeline security has been improved
- Developed a Drought Response Plan to assist in managing through the current drought
- Undertook major studies into the condition of some key assets and implemented an asset improvement and reliability program
- Developed a new water quality monitoring program and installed eight new thermistor chains to provide real-time water quality data
- The Warragamba Spillway project has reached practical completion, and a tender has been let to upgrade the Warragamba dam outlet valves and associated infrastructure
- Environmental flow releases commenced as provided for under the Water Management Licence. Compliance assessed at 99.8 per cent in 2003-04
- Developed an adaptive long-term demand and supply strategy for consideration by the Minister for the Environment

4.3.2 Catchment Management

- Negotiated and progressed a five-year, $20 million, Accelerated Sewerage Scheme to fast-track upgrades to sewage treatment plants in the catchment
- Developed the Healthy Catchments Program as the SCA's umbrella program for catchment protection, catchment enhancement and community involvement programs. The $65 million five year program was endorsed in 2004
- Established the SCA's regulatory role by training SCA staff in the use of powers under relevant legislation, implementing a littering enforcement program, and issuing penalty infringement notices
- During 2003-04 the SCA provided a contribution of $498,000 to DEC to assist with the purchase of private lands within the Warragamba Special Area. These lands were added to the National Parks estate and their protection will aid in the protection of water quality and ecological integrity within the special areas

4.3.3 Land Use Planning

- Considered and assessed over 4,000 development applications for concurrence under SEPP 58, providing advice to local government and the community in relation to the design and assessment of development that addresses SEPP 58 matters. Built GIS tools to support land use management
- Participated in the development of the Regional Environment Plan (REP) (a process led by the Department of Infrastructure, Planning and Natural Resources), including leading recent community consultation. The SCA is also leading the development of associated policy and assessment tools to support the implementation of the REP

4.3.4 Education

- An education strategy has been established to deliver best practice environmental education across the catchment, in line with Government's Environmental Education Strategy and the SCA's business plan. The strategy focuses on behaviour change, integration, partnerships and eduction for sustainability
- Delivered a school eduction program to more than 7,000 school children each year through the Warragamba Dam Education Service. This program has an increasing focus

on professional and curriculum development for teachers, adding a self-sustaining component to the program

- Established SCA Streamwatch in the drinking water catchments encompassing 40 community groups and schools
- Developed remote learning opportunities for the general community and students through the SCA website and the Student Resource Service

4.3.5 Science and Research

- Developed a five year Research Program
- Established a Collaborative Research Program involving 14 water quality research projects with a range of universities, Commonwealth Scientific and Industrial Research Organisation (CSIRO), and Australian Nuclear Science and Technology Organisation (ANSTO)
- Collaborated with the Cooperative Research Centre (CRC) for Water Quality and Treatment in several pathogen related projects funded by the American Water Works Research Foundation
- Participated as a member of the CRC for Water Quality and Treatment and the CRC for Freshwater Ecology and helped shape the research agendas of these organisations

4.3.6 Corporate Initiatives

- Completed a major management reform to re-design the SCA's finance and finance related processes and systems, and to integrate them into a single electronic Financial Information Management System
- Developed a corporate governance framework, aligning governance obligations and accountabilities to the SCA's business plan, operating licence and other organisational requirements
- Progressively improved operating licence compliance outcomes over the period of the price path resulting in the achievement of full to high compliance in 90 per cent of requirements in 2002-03
- Finalised water supply agreements with Sydney Water and all minor customers

4.3.7 Financial Performance

- Achieved financial targets contained within the SCA's annual Statements of Financial Framework
- Improved credit rating from 'A–' in 2000-01 to 'A' in all subsequent years to date

5 Expenditure Management

The SCA's operating and capital expenditure requirements are driven by its business plan and are aimed at achieving its key result area outcomes. The SCA has processes in place to ensure that this is achieved efficiently.

Catchment operations and bulk water related expenditure leading to water quality and productivity improvements are supported by the SCA's risk management framework and are made after investigation of risks and trade-offs. For instance, in bulk water planning, Failure Modes Effects Criticality Analysis studies enable the SCA to take a targeted approach to managing its assets by prioritising extreme or major risks.

All expenditure is governed by submissions and business case approvals. For projects with a value of more than $100,000 a financial evaluation is undertaken, comparing the value of the outcomes of the proposed expenditure against realistic alternatives, including not proceeding with the project at all. For higher project expenditures, more comprehensive methodologies and more intensive review are undertaken, including oversight by NSW Treasury for large capital projects. SCA will conduct future procurement under the Agency Accreditation Scheme of NSW Government Procurement Policy. NSW Treasury has accredited SCA for planning and delivery of construction procurement greater than $1 million under this system.

These processes combine to offer a rigorous system for avoiding potential inefficiencies such as duplicating operating expenditure rightfully undertaken by the Catchment Management Authorities or the 'gold plating' of the SCA's essential capital works.

5.1 Service Standards

The operating licence sets out requirements to be met by the SCA in relation to quality standards for bulk water, catchment management, and water supply. To date the SCA has achieved excellent performances in successive operating licence audits confirming its consistent maintenance of high service quality against the wide range of requirements. The audit for the year ending June 2004 is currently underway.

In addition, the Bulk Water Supply Agreement between the SCA and Sydney Water, its primary customer, specifies water quality and other standards. The SCA targets greater than 95 per cent overall compliance with the Bulk Water Supply Agreement.

Since its creation the SCA has had no interruption to bulk water supply, and has complied 100 per cent with Dams Safety Committee requirements and ANCOLD guidelines.

5.2 Projected Capital Expenditure

The SCA's capital program contains works required to maintain and improve the service potential of the SCA's infrastructure and to comply with contemporary standards.

The capital works program of the SCA is primarily aimed at the construction or renewal of assets that are used to collect, store and deliver bulk water to its customers. One of the core objectives of the SCA is to provide customers with a reliable water supply. The SCA undertakes its capital program to ensure its ability to supply customers with bulk water.

The Metropolitan Water Plan has had a major impact on the SCA's capital program. The SCA anticipates that the works foreshadowed in the Metropolitan Water Plan are in the order of $442 million.

5.2.1 Existing Capital Projects

The SCA's current capital expenditure program is set out in Table 6. Note that this table excludes the possible expenditure on mini-hydro systems – this expenditure is outside the IPART price determination and will be funded through generated revenue.

Table 6 – Current Capital Program

Project ($M of the year)	2004-05	2005-06	2006-07	2007-08	2008-09
Warragamba Dam Auxiliary Spillway project	3.4	8.3	5.2	2.0	
Warragamba Dam upgrade major outlet valves	3.5	2.5	1.5	1.2	
Warragamba Dam electrical upgrade	4.1	5.0	1.2		
Warragamba Pipeline spare pipes & fittings	2.9	1.0			
Bulk Water access road upgrades	4.3	3.0	5.0	5.0	
SCA Dams, modifications for environmental flows	0.2	1.4	1.4	1.4	0.7
Tallowa Dam fishway/ offtake	0.7	2.5	3.1	0.2	0.1
Fish River water supply, upgrade transfer system	0.5	3.9	0.5		
Prospect Reservoir raw water pumping station	12.0	27.7	6.0		
Penrith Head Office relocation	3.8	4.2			
General facility projects	9.4	5.8	3.4	1.4	
Land	1.0	0.9	0.1	0.0	0.0
Buildings	1.7	1.4	0.8	0.4	0.4
Plant and equipment	1.4	1.1	1.1	1.1	0.9
TOTALS	**48.7**	**68.7**	**29.2**	**12.7**	**2.0**

The above expenditure is for existing projects and excludes expenditure on unplanned renewals. Details of these projects are outlined below.

Warragamba Dam Auxiliary Spillway Project

This project was commenced in 1998 and the major work on the spillway was completed in June 2002. The spillway was officially ‘opened’ by the Minister for the Environment on 20 July 2003. The remaining expenditure relates to spillway gate upgrades, major site restoration plus the construction of a new visitor’s centre and operational building.

Warragamba Dam Upgrade Major Outlet Valves

This project will provide a critical emergency safeguard against runaway conditions in the event of a burst in the Warragamba Pipelines immediately downstream of the dam by replacing the four existing outlet valves with new butterfly valves. A contract has been let for this project with one outlet (of four) being scheduled for completion each winter period.

Warragamba Dam Electrical Upgrade

This project will modernise the 1950s wiring and electrical equipment to meet contemporary standards and will provide greater reliability and safety for both normal operation and during flood events. This project is underway.

Warragamba Pipeline Spare Pipes & Fittings

This process aligns with the Prospect Raw Water Pumping Station in that it ensures that sufficient spare parts for the Warragamba Pipelines are available to ensure that, if a pipeline

is damaged, it can be repaired before the pumping station exhausts its water supply.

Bulk Water Access Road Upgrades

This project covers the upgrade of deteriorated critical access roads at Bulk Water facilities for both OHS&R and operational requirements. The Roads and Traffic Authority is nearing the completion of a comprehensive road condition audit that will allow development of the capital works and maintenance programs for SCA roads into the foreseeable future.

Tallowa Dam Fishway/ Offtake

This project is a response to the requirement from the Department of Fisheries to provide a by-pass around Tallowa Dam to allow fish to migrate to the upper reaches of the Shoalhaven River and hence improve the quality of the river. The new offtake will allow water of optimum temperature to be used in the fishway.

Fish River Water Supply, Upgrade Transfer System

The Fish River Water Supply Scheme (FRWS) pipeline from Narrow Neck pumping station to Upper Cascades Dam is nearing the end of its useful life. FRWS is looking into allocating additional supplies to the SCA to meet Blue Mountains demands. This project is for the investigation, design and construction of a new water main, with increased capacity.

Prospect Reservoir Raw Water Pumping Station

This project covers the construction of a new pumping station that will provide increased pumping capacity and access greater storage depths of water from Prospect Reservoir to feed the Prospect Water Filtration Plant in times of emergency and shortage. If the Upper Canal and/or Warragamba Pipeline supply is interrupted, this will provide backup supply for a limited time.

Penrith Head Office Relocation

This project covers the relocation of the SCA head office function from the various buildings presently leased in Penrith to a new single location in Penrith.

5.2.2 Future Capital Projects (including Metropolitan Water Plan activities)

Likely expenditure on future works and capital works required to meet the requirements of the NSW Government's Metropolitan Water Plan proposals are included in Table 7 which details new capital requirements. Note that this work will continue past 2009-10.

Table 7 - Future Capital Requirements

Project ($M of the year)	2004-05	2005-06	2006-07	2007-08	2008-09	2009-10	To complete
Future Works							
Prospect Dam remedial works	3	8	2				
Upper Canal strategic upgrade						23	100
New facility projects						12	On-going
Metropolitan Water Plan							
Accessing deep storages	19	89					
Groundwater investigation	2	2					
Shoalhaven transfers			95	129	77		430 (Stage 2)
Environmental flows					14	15	

Details of these projects are outlined below.

Prospect Dam Remedial Works

An estimated amount of $13 million has been allowed for in the period from 2004-05 to 2006-07 for dam safety related work on Prospect Reservoir to ensure that reservoir drawdowns by the Prospect Reservoir Raw Water Pumping Station do not endanger the dam.

Upper Canal Strategic Upgrade

A contract to examine the long-term strategy for the Upper Canal was let to the Snowy Mountains Engineering Corporation in June 2002 as part of a structured evaluation process. For financial modelling purposes an indicative amount of $100 million (in 2004-05 dollars) has been flagged from 2009-10 to 2012-13. The amount may increase dramatically depending on the assessed condition of the asset, and the system flexibility that is deemed to be appropriate. This project may also be impacted by the outcomes of the Government's Metropolitan Water Plan.

New Facility Projects

From 2009-10 onward approximately $10 million per annum has been allowed for to cover future renewals.

Accessing Deep Storages

An estimated 242 gigalitres or 10 per cent of the water stored in SCA dams cannot be currently utilised as it is below the offtake levels for water supply. This is sufficient to supply Sydney for six months, and as the drought progresses it is becoming critical that this water can be made available for water supply. Preliminary estimates to build infrastructure to access this deep storage is $106 million, but further analysis is needed prior to construction.

Investigation of Groundwater Resources in the Sydney Basin

While groundwater in the Sydney region has limited potential for permanent water supply as in other cities, it may be a possible drought relief option. To enable this potential to be determined the SCA with the support of DIPNR is proposing to undertake a groundwater study including test drilling of aquifers. This is estimated at approximately $4 million over 2004-05 and 2005-06.

The groundwater project also includes an assessment of the potential for water contained within abandoned underground coalmines to be recovered.

Shoalhaven Transfers

The SCA transfers water from the Shoalhaven River to top up the Sydney dams. This however means that water is transferred from the Shoalhaven River when it is under drought stress, and the transfer system relies on run-of-river transfers that degrade river health. The SCA is considering options to increase the transfers from the Shoalhaven River by raising the system storage level at which transfers could be made, allowing more environmental flow releases during low flow conditions, and moving transfers from rivers to pipelines and tunnels.

Preliminary costs have been prepared for one option for increasing Shoalhaven transfers, but the SCA is committed to fully examining and consulting with the community on options for changing the operating rules and building pipelines and tunnels, and then in 2007 commencing construction.

Environmental Flows

The Hawkesbury Nepean River Management Forum was tasked by Government to consider and make recommendations on appropriate environmental flow regimes from the SCA's water storages.

At the present time the SCA dams have single off-takes for extracting water. For drinking water quality reasons it is generally preferable to extract water from deep within storage rather than from the surface layers. This water as extracted is generally cold and releasing it for environmental flow purposes can have a deleterious effect on fish breeding and the

ecosystem more generally. The SCA may be required to install additional off-takes to enable the differing water needs of consumptive users and the environment to be met simultaneously without detrimental effects to either.

In addition the SCA own a number of weirs downstream of its Nepean storages. These weirs were built to provide weir pools to compensate irrigators and other users for the reduced flows that occurred subsequent to the construction of the storages.

The capital cost of modifications to the SCA dams to allow for additional environmental flows has been estimated at $23 million. The cost of modifying the SCA weirs on the river is estimated to be $7.5 million.

5.3 Projected Operating Expenditure

The direct and indirect operating expenditures over the next five years are shown in Table 8.

Table 8 - Operating Expenditure

($M)	2004-05	2005-06	2006-07	2007-08	2008-09	2009-10
Core operating	79.2	81.0	83.1	85.4	86.3	88.7
Deep storages			0.8	0.8	0.8	0.8
Environmental flow monitoring		0.7	1.4	1.4	1.4	1.5
Shoalhaven transfers						3.2
Shoalhaven pumping						6.8
TOTAL ($M)	**79.2**	**81.7**	**85.3**	**87.6**	**88.6**	**100.9**

The SCA proposes to cap its core operating expenditure (including insurance) in real terms over the price path. The budgeting module in the financial component of the SCA's newly implemented Information Management System has greatly enhanced the SCA's budgeting processes. The ability to closely track costs in comparison to budget will support the implementation of the efficiencies required to maintain this cap.

However, in addition to its core expenditure the following significant operating expenditure items are also expected over the regulatory period.

5.3.1 Deep Storages

Routine operations and maintenance costs in relation to the equipment necessary to access the deep storages (under drought conditions) are expected to be about $0.8 million per annum. Pumping costs will only be incurred if the storage levels fall below 10 per cent in severe drought conditions. As this is an unlikely event no costs have been included in the modelling.

5.3.2 Environmental flow monitoring program

The SCA is progressively implementing increased environmental flows from the metropolitan dams. The SCA will be monitoring the environmental improvement from the increased flows and using this to determine the optimal environmental flow regime at other dams. The baseline cost of such a program is estimated at about $1.3 million (in 2004-05 dollars).

5.3.3 Shoalhaven Transfers

The SCA pumps water from the Shoalhaven system (Tallowa Dam) during drought. Because it is not possible to predict when such pumping is likely to be required the SCA does not include this expenditure in submissions.

Increased transfers from the Shoalhaven are expected to cost about $10 million per annum on average once the infrastructure and operating rule changes to the Shoalhaven scheme are approved and implemented. Transfers from the Shoalhaven will remain a drought relief

option, but the frequency of pumping will increase from the current one year in eight to an estimated one year in three under changes being considered. Average pumping costs have been included in the modelling.

5.4 SCA's Braidwood Landholdings

In its Metropolitan Water Plan the government has outlined its vision for the future for long term water supply. This vision does not include construction of the Welcome Reef Dam. Prior to this, from 1971 onwards, the SCA and its predecessors had progressively acquired land in the Braidwood district (known as the Braidwood lands) to facilitate the possible construction of a dam known as the Welcome Reef dam. In October 2002, 5,595 hectares of the SCA's Braidwood lands values at $902,000 were gazetted as nature reserve and transferred to the Department of Environment and Conservation (then the National Parks and Wildlife Service). The SCA's remaining holdings amount to 21,500 hectares, and are currently valued at about $16 million.

The SCA has developed a plan for managing the land. Financial analysis undertaken to assess the cost of implementing the plan suggests that an average cost of $900,000 per year would be required to manage the lands in a manner which would meet local community expectations of the SCA as a public agency, and to maintain the market value of the lands. Maintenance of heritage buildings will require $285,000 and to maintain other houses at a tenantable or stable standard will cost $560,000.

The SCA funds the management of its Braidwood property from operational and capital expenditure. Given the changed potential use of this land to the SCA, the question of whether the SCA's approach remains an appropriate strategy over the longer term needs to be addressed. The future funding arrangements need further consideration. IPART might wish to consider this matter in the context of the current price review.

6 Regulatory Framework and Pricing

6.1 Form of Regulation

The SCA sees no reason to move away from the current 'price cap' form of regulation that IPART has applied to the SCA and other metropolitan water agencies in previous determinations. Under the 'price cap' form of regulation IPART sets maximum prices for the agencies' regulated services. This is in contrast to a revenue cap whereby IPART directly determines maximum allowable revenues. However, NSW Treasury in discussion with the metropolitan water agencies has proposed two refinements in relation to future regulation. These relate to a 'cost pass through mechanism' and 'adjustment for revenue volatility'. The SCA supports both these proposals as detailed below.

6.1.1 Cost 'Pass Through' Mechanism

A key element of incentive-based regulation is that regulated prices are established for a predetermined period. Once prices are set, the regulator does not subsequently adjust prices within the regulatory period to reflect differences between actual and forecast costs of service provision.

Under this framework, regulated businesses can retain additional profits that arise from better than expected performance in reducing costs. Similarly, the business is not compensated for failing to achieve the predicted cost targets established by the regulator. The scope to earn higher or lower returns from superior or below standard performance, underpins the efficiency incentives inherent under the CPI-X form of regulation.

However, a problem arises if events that may be substantially or totally outside the control of the regulated business leads to significant and unexpected costs being imposed on the business. Such events may include important policy changes in relation to the management of water resources or government decisions on urban growth that may impact on future service costs.

There are a number of significant uncertainties that surround the current price determination, such as the possibility of new obligations for environmental flows and proposals for managing water scarcity, which may have significant unforseen impacts on costs.

Unless there is an ability to respond to these events as they transpire it is possible that an agency might have insufficient revenue to meet its service obligations. Accordingly it is proposed that a cost 'pass-through' mechanism be introduced to manage these risks.

There are a number of principles relating to such a mechanism, including:

- Non-controllable risks: Events that trigger a review should be outside the control of the business;
- Materiality: The event should lead to a material impact on the regulated business;
- Review costs: The regulatory arrangements should minimise the costs associated with approving adjustments. This suggests that some rules and processes should be predetermined to establish how these adjustments will be considered;
- Predictability: The scope of any review should be confined to determining the cost changes triggered by the event.

In order to provide greater regulatory certainty and ensure that risks are appropriately managed, a well-defined and systematic process should be put in place for responding to unforeseen events, that enables prices to be adjusted within the period in response to certain trigger events. Trigger events should be outside the control of the regulated business and identified in advance. A potential list of specific trigger events includes:

- costs associated with meeting new and unforeseen demand management or growth related directives relating to Government policy;
- amendments to environmental standards or legislative obligations;

- changes in regulatory obligations (for example, changes to laws that influence the costs of laying/repairing underground assets);
- changes in licence obligations;
- changes to tax treatment of certain expenditures; and
- cost associated with catastrophic events such as acts of terrorism, natural disasters (such as drought, floods, fires) and earthquakes.

It is proposed that IPART agree to a pass through if the trigger event leads to a material change in costs. A possible materiality threshold may be an event that leads to a 2 per cent change in the level of average costs.

It is noted that IPART has recently endorsed the introduction of a process for passing through certain costs for electricity distribution businesses and that ICRC, the ACT regulator, has also introduced a similar arrangement.

6.1.2 Revenue Volatility Adjustment Mechanism

IPART's *Issues Paper* identifies the potential revenue volatility associated with consumption forecasting and medium term price setting in the current environment of continued drought and water restrictions. Future demand management initiatives and potential changes in environmental requirements will only further increase revenue volatility over the next regulatory period. In particular, the mooted changes in price structures (i.e. increasing volumetric component) will significantly increase the impact of forecast uncertainty. Given that underlying costs are largely fixed, this translates to significant earnings risk for NSW water businesses.

It is proposed that IPART introduce a mechanism to address forecast risk and resultant revenue volatility. IPART's *Issues Paper* states that the need for such a mechanism is dependent on who is best placed to manage the risk. As the volume of water sales is largely outside the control of both the business and individual customers, neither is best placed to bear the risk. As such, the proposal is that risks should be shared.

The option, outlined in IPART's *Issues Paper*, that incorporates a mechanism to adjust revenue in the subsequent price path period for a component of any excess / shortfall revenue arising due to differences between forecast and actual consumption is supported in principle. It is proposed that consumption variations be measured cumulatively over the regulatory period and be subject to a tolerance band (of say 2 per cent to 3 per cent) before any adjustment mechanism is triggered.

Further, to ensure that agencies are not 'penalised twice' in terms of revenue smoothing, any additional revenue arising from higher than forecast consumption should be measured against the 'unsmoothed' (rather than 'smoothed') revenue requirement[1]. This means that any additional revenue arising from excess consumption will be first offset against any shortfall associated with revenue smoothing (in net present value terms), before being passed on to customers.

This approach shares the risk of forecasting errors between businesses and customers, and reduces the inherent incentive under a price cap to understate forecast volumes. It also reduces incentives for businesses to maximise profit by selling more water (to the limited extent that businesses can impact on sales volumes).

The SCA is happy to work with IPART to further develop the form of revenue adjustment mechanism and the extent to which the risk should be shared between water businesses and customers.

[1] This assumes that IPART will adopt an end point smoothing methodology.

6.2 Regulatory Period

The SCA's current determination covers a regulatory period of just under five years (from October 2000 to June 2005). However a number of issues regarding the management of Sydney's demand and supply balance, with significant operating and capital expenditure implications, will be addressed over the next year or two. Therefore the SCA considers that it would be too risky to lock in prices for longer than a four-year period (i.e. to 30 June 2009). The revenue and pricing information in this submission covers this period.

6.3 Regulatory Asset Base

When the SCA was established in July 1999, the asset base it inherited from Sydney Water was written down from $1,653 million (in Sydney Water's books) to $647 million. The latter figure was independently estimated by PricewaterhouseCoopers on an economic value basis. IPART, in turn, based its 2000 determination for the SCA on an underlying 'regulatory asset base' that was derived from this.

For the mid term review of the SCA's prices in 2003, IPART used the RAB it established in its 2000 review and 'rolled this forward' into the 2003-2005 regulatory period by adding an allowance for prudent capital expenditure, and accounting for inflation and depreciation.

The SCA's has followed the same methodology in estimating the RAB for the next price path.

6.4 Return on Assets

The return on assets is determined by multiplying the agency's regulatory asset base (RAB) by an appropriate rate of return.

At the time of IPART's September 2000 determination for the SCA, IPART estimated the water agencies' Weighted Average Cost of Capital (WACC) to be in the range of 4.8 per cent to 7.8 per cent on a real pre-tax basis. IPART estimated that the price path it had determined for the SCA would enable the SCA to earn a rate of return of 7.1 per cent and 6.4 per cent real pre-tax in 2000-01 and 2001-02, and 5.8 per cent to 5.1 per cent from 2002-03 to 2004-05.

In its mid-term review report in 2003 IPART expected the SCA's rate of return on the regulated asset base to be around 5.3 per cent in 2003-04 and 4.9 per cent in 2004-05. IPART stated that although this return is relatively low compared with some competitive industries it believed that it was "reasonable given that the Catchment Authority operates in a low risk environment".

The appropriate return on the asset base is a matter for IPART to determine as it does for other monopoly services. In June 2004, IPART determined a WACC range of 6.1 to 7.5 per cent for the NSW electricity distributors. For modelling purposes the SCA has used a WACC of 6.5 per cent real pre-tax to be achieved by 2008-09. The WACC range is detailed in Appendix C.

7 Revenue Requirements

The SCA must meet the requirements of its Act and provide raw bulk water to its customers. The current program to allow it to meet these obligations is summarised in Table 9.

Table 9 – Current Program

($M of year)	2004-05	2005-06	2006-07	2007-08	2008-09
Capital expenditure	51.7	76.7	31.2	12.7	2.0
Operating expenditure	79.2	81.0	83.1	85.4	86.4

In addition to the current program, the SCA now has commitments to the NSW Government's Metropolitan Water Plan, as detailed in Table 10.

Table 10 – Metropolitan Water Plan

($M of year)	2004-05	2005-06	2006-07	2007-08	2008-09
Capital expenditure	21	91	95	129	91
Operating expenditure	0.0	0.7	2.2	2.2	2.2

The SCA will require sufficient revenue to enable the above expenditures to be incurred. The capital expenditure will lead to a substantial increase in the level of the SCA's borrowings, and financing charges, thereby placing considerable pressure on the SCA's credit worthiness.

The prices determined by IPART will need to generate sufficient revenue to cover the above operating expenditure, depreciation, plus a commercial return on assets, thereby enabling the SCA to meet its increased financing charges as well as to maintain its borrowing capacity.

8 Recommended Prices

The following sections discuss the SCA's pricing proposals in order to generate the revenues required over the proposed price path from 2005-06 to 2008-09.

The SCA proposes that in order to fund the expenditures under its current program it will require average price increases of CPI +2.0% per annum. In addition to this, in order to fund expenditures under the Metropolitan Water Plan, the SCA will require additional price increases of CPI + 4.1% per annum.

The price increases determined by IPART will also need to allow for an appropriate rate of return on the SCA's assets. This is required to cover increased financing charges as well as to enable the SCA to remain a viable commercial entity.

8.1 Pricing Structure

The water supplies available for the Sydney, Blue Mountains and Illawarra regions have been consumed at a level above the current sustainable yield of the existing infrastructure. Through the Metropolitan Water Plan the Government is working to address this supply/demand imbalance by a range of measures including enhanced demand management, increased urban water harvesting via rainwater tanks, reuse and recycling, improved urban and housing design.

In September 2003 the Premier requested IPART to investigate alternative price structures for retail and wholesale water prices, to assess their potential to reduce demand for water in the Sydney Basin as a prelude to the next pricing review for metropolitan water agencies. IPART released its report on the outcome of its investigation in July 2004.

IPART concluded that in relation to the wholesale price structure charged by the SCA to Sydney Water, IPART is not convinced that introducing a step price structure for the usage charge is the most appropriate way to remove the financial incentive on Sydney Water to sell more water, enforce a cap on water extractions, or assist with the development of a secondary market in alternative water resources.

IPART states that if the Government decides to limit the amount of water that Sydney Water can take from the SCA, IPART could consider whether a penalty should be introduced for breaching the cap as part of its current licensing review for Sydney Water. The use of any revenue generated by the penalty would be for the Government to decide.

8.2 Proposed Prices

IPART considers that the appropriate next step towards wholesale water price reform is to review the balance between the SCA's access charge and the usage charge and, if possible, set the usage charge with reference to the SCA's long run marginal cost.

8.2.1 Sydney Water

In response to IPART's findings, the SCA proposes that the real price increases needed to generate the required revenue from sales to Sydney Water be applied through the volumetric component of the charges to Sydney Water. It is proposed to adjust the fixed component by the CPI only. This will result in the volumetric component of the SCA's revenue from Sydney Water progressively increasing, as a proportion of the SCA's total revenue.

8.2.2 Wingecarribee Shire Council

Wingecarribee Shire Council currently purchases between 3,000 and 4,000 megalitres of water per year from the SCA for treatment and resale to its customers. This water is drawn from the nearby Wingecarribee Reservoir. In 2003-04 the total charge to Wingecarribee Council was $323,328 for 3,442 megalitres.

The current price determination calls for Wingecarribee Council's usage price to increase by approximately $10 per megalitre above CPI to allow the prices to increase to a level

comparable to Sydney Water's usage charge. However unlike Sydney Water, Wingecarribee Council does not pay a fixed charge.

In keeping with IPART's intention to review the balance between the SCA's fixed access charge and usage charge to Sydney Water, rather than introducing a fixed access charge, the SCA proposes that Wingecarribee Council continue to pay a usage charge only. In 2004-05 the Wingecarribee Council usage charge is approaching parity with that of Sydney Water. Accordingly the SCA recommends that this nexus be maintained over the next price path.

8.2.3 Shoalhaven City Council

As with Wingecarribee Shire Council, the price charged to Shoalhaven City Council (for its regular supply to Kangaroo Valley) also currently increases by approximately $10 per megalitre above CPI. Shoalhaven Council also does not pay a fixed access charge. In 2003-04 the total charge to Shoalhaven Council was $7,968 for 85 megalitres. As in the case of Wingecarribee Council, the SCA recommends that the nexus with Sydney Water's usage charge be maintained over the next price path.

The SCA proposes that the same prices should also apply to Shoalhaven Council for bulk water supplied via releases from Tallowa Dam during extreme drought periods.

8.2.4 Smaller Customers

Although the SCA is a bulk water supplier, with 99.3 per cent of sales to one customer, Sydney Water, it also supplies water to Shoalhaven and Wingecarribee councils and sixty smaller 'retail' customers. The two councils together account for 0.6 per cent of sales, with the remaining 0.1 per cent going to the retail customers. The retail customers have direct off-takes from pipelines, canals and storages.

In its original price determination for the SCA, IPART recognised the need to align prices between Sydney Water's customers and the SCA's retail customers. In making its price determination for the SCA's retail customers, IPART:

- took into account the fact that when normal reticulated water supplies are available from Sydney Water, customers are required to disconnect from the major transportation conduits of the SCA and reconnect to Sydney Water's 'normal' distribution mains
- sought to avoid any price shocks that this might generate to the SCA's customers
- maintained the signal in relation to demand management and efficient resource use, to the SCA's retail customers, similar to that for Sydney Water's customers.

The water supplied to retail customers is classified into two categories, raw water and unfiltered water[2]. Under the current price path raw water customers pay only a volumetric charge, based on usage. Unfiltered water customers pay a volumetric charge as well as a fixed service availability charge.

SCA and Sydney Water pricing for unfiltered water have diverged marginally in recent years years, since IPART determined a different CPI-X value for Sydney Water's volumetric charge in its last determination for Sydney Water in 2003. However, it would be consistent with IPART's previous approach if SCA prices were realigned with Sydney Water's in this determination, and the SCA recommends as such.

In lieu of the recommended realignment of prices with Sydney Water, the SCA proposes that the volumetric prices for these classes of customers be at least maintained in real terms. It is also proposed that the fixed availability charge for unfiltered water customers be fixed (in nominal terms). This continues the previous IPART determination and is consistent with IPART's current view[3] that there needs to be a rebalancing between the fixed and usage

[2] Unfiltered water differs from raw water in that it has been managed for quality, whether by chemical treatment or otherwise (but not treated at a filtration plant).

[3] Ibid. Pg. 1-2

charge(s) at both the wholesale (and retail) level.

Table 11 shows the usage distribution of the SCA's smaller customers.

Table 11 - Number of SCA Customers by Consumption Class

(kL per annum)	Customers
0	13
100	2
150	2
200	1
250	4
300	6
400	2
500	8
> 1000	23
Total	61

Over a third of SCA's customers consume more than 1,000 kilolitres a year (i.e. typically mine or industrial customers), and hence cannot be compared to Sydney Water's residential sector. If Sydney Water introduces retail inclined block pricing, there will be a divergence between the SCA (and Sydney Water's) unfiltered water tariffs and Sydney Water's filtered water tariff.

Appendix A – SCA Water Quality Management Framework

Figure 1

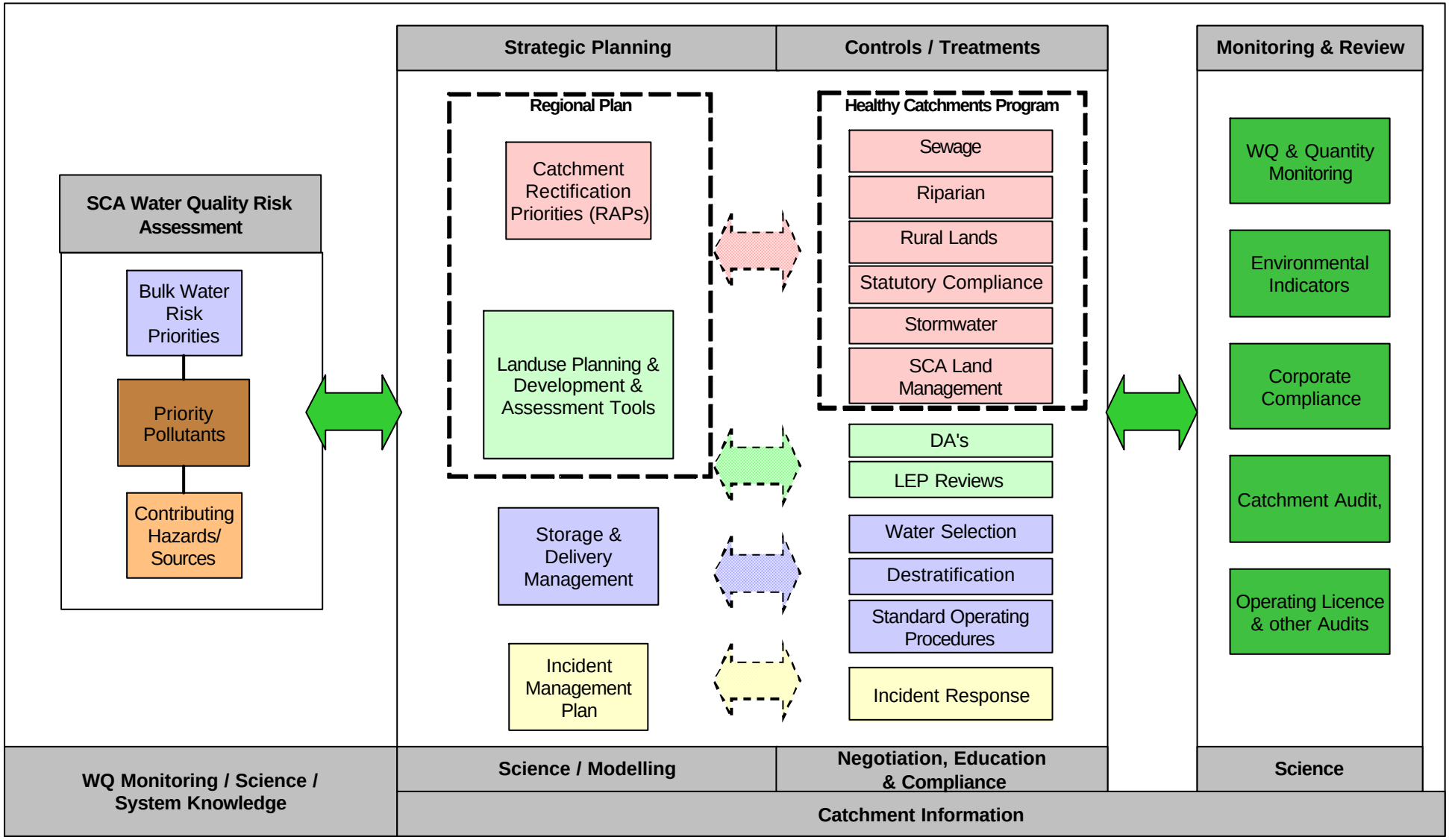

Figure 2 Examples of the Catchment Management Framework by Process

Identify the priority pollutants for mitigation/control	Identify the key pollutant sources or hazard events	Locate the high priority sources of the pollution or hazard	Identify the likely mitigations, rectifications or development controls	Select and detail design rectification actions and/or development controls and deliver improvement actions	Monitor & Evaluate
Future Land Uses & Activities (Preventing pollution)					
Suspended sediment is a high priority in Sooley Dam catchment (LWSRP)	Map of landscape hazard: slope & sediment delivery potential of soils (SLWCA)	Map of landscape hazard ratings across catchment (SLWCA)	Land zoning modified to reduce erosion potential (SLWCA/LEP)	Recommended practices for sediment control in rural residential subdivisions (CRP) Assessment tests on DA's for sediment export potential.(NorBE)	Compliance Assessment
Existing Land Use & Activities (Responding to existing pollution)					
Identification of cryptosporidium is a priority pollutant in Warragamba catchment (WQRMF)	Livestock defecation in streams (WQRMF)	Drainage units rated & mapped according to livestock intensity near streams (RAP)	Revised stock management near streams (RAP)	Implement recommended practices (CRP) for stock management in riparian lands Grant for 1km of fencing and alternate stock watering along Kelly's Creek	Catchment Audit
E. coli spike in water storage dam (Predicting future pollution)					
After a long dry period SCA's water quality monitoring network shows a repeated spike in E. coli entering a water storage dam after heavy rain	E. coli entering a water storage dam after heavy rain	An exception report is produced from the monitoring network Analysis of the data identifies the stream or river carrying the contamination CIS identifies all upstream tributaries, current land uses, vegetation, coverage and slope	The most probable sources of contamination are identified along with current SCA, CMA or Council improvements programs operating in the subcatchments	Implement priority actions and appropriate responses to reducing the 'spike' in E. coli re-occurring after future rainfall events.	Water quality monitoring network
Bushfire management (Predicting, preventing and responding)					
Bushfires can impact on water quality through sediment loss	In 2002-03 7300 hectares of catchment lands were affected by fire	Recovery plans implemented including an asset replacement program and a fire maintenance program with some 70 kms of fire trails being repaired	Research into the impacts of nutrients on post-fire water quality	The SCA responds to fire outbreaks as they occur, provides seasonal fire crews and funds the staffing of fire towers.	Investigate catastrophic events occurring over the very long term to increase understanding of the chances and likely impacts of future catastrophic events.

Appendix B – Business Plan – Vision, Values and Key Result Areas

Vision

Healthy catchments, quality water - always

Our Role

To capture, store and supply quality bulk raw water through responsible management and partnerships with stakeholders

Our Key Values

- Being accountable
- Caring for the environment
- Behaving ethically
- Working together
- Acting professionally
- Being respectful
- Ensuring safety

Major activities within each KRA include the following:

KRA 1 – Threats to water quality minimised

- Sustaining the Catchments Regional Plan
- Water Quality Risk Management Framework
- Healthy Catchments Program

KRA 2 – Sustainable, reliable water supply

- Demand and supply management strategy
- Drought management
- Risk, Incident, Security management
- Water quality and quantity monitoring
- Compliance management

KRA 3 – Commercial Success

- Financial Information Management System
- Financial management – IPART Pricing Reviews, Statement of Financial Framework
- Internal audit
- Risk, Incident, Security management

KRA 4 – Building and Sharing Knowledge

- SCA Research Program – Collaborative Research
- Education Strategy 2003-2006

- Grants Framework

KRA 5 – Results through Relationships

- Customer supply agreements
- Community consultation framework
- Strategic inter-agency forum representation

KRA 6 – Dynamic, Supportive Workplace

- New SCA award and award variation
- Performance Management System
- Job evaluation system
- OHS&R management and health monitoring programs

KRA 7 – Quality Systems and Processes

- Corporate Governance framework
- Review of the Sydney Water Catchment Management Act 1998
- Business Management system – certification of Dam Safety Branch to international standard, AS/NZS ISO 9001; 2000
- Process improvement – office management, IT management
- Compliance management

Appendix C - Weighted Average Cost of Capital

The weighted average cost of capital (WACC) provided by regulators is a critical parameter in terms of providing incentives for efficient investment in water infrastructure. As noted in IPART's *Issues Paper*[4], managing the supply/ demand imbalance and potential changes to improve environmental flows may require significant capital expenditure to modify existing supply infrastructure. Incentives to incur required capital expenditure will be weakened if a commercial rate of return is not provided.

In its 2002 Review of the National Access Regime, the Productivity Commission noted:

> *Third party access and the resulting benefits to service users are only possible over the longer term if there is continuing investment in the essential infrastructure services themselves. On the other hand, while denial or monopoly pricing of access imposes costs on the community, such behaviour cannot threaten the continued availability of the services concerned. This asymmetry in potential outcomes highlights the priority that access regulation must give to ensuring that there are appropriate incentives for efficient investment'* [5]

IPART's *Issues Paper* does not specifically address issues relating to WACC. Rather, it refers to IPART's recent *Electricity Distribution Pricing Determination*[6] for information on the Tribunal's preferred approach for calculating the rate of return on capital. In June 2004, IPART determined a 7.0 per cent real pre-tax WACC for NSW electricity distributors.

It is considered that there should not be a material difference in the underlying WACC provided for electricity versus water infrastructure assets. This view is supported in recent decisions by the Independent Competition and Regulatory Commission (ICRC)[7], which applied a common WACC (7.0 per cent real pre-tax) to both ActewAGL's electricity and water businesses.

The building block regulatory approach dictates that WACC should be an input to the revenue determination process, not an output. In previous water determinations the final WACC adopted was at the low end of IPART's recommended range. In the upcoming determination, it is strongly recommended that WACC be used as an input to determine revenue requirements and resultant water prices, and not an output.

Importantly, IPART should have regard to the Productivity Commission's observation that regulators should 'err' on the side of promoting long-term investment in new and existing infrastructure assets:

> *The possible disincentives for investment in essential infrastructure services are the main concern. In essence, third party access over the longer term is only possible if there is investment to make these services available on a continuing basis. Such investment may be threatened if inappropriate provision of access, or regulated terms and conditions of access, lead to insufficient returns for facility owners.* [8]

The real pre-tax WACC determined by IPART in its previous determination for the SCA is inadequate and does not reflect the commercial return required by investors to invest in water infrastructure. Accordingly a real pre-tax WACC range of 6.1 per cent to 7.5 per cent is proposed based on the following parameters.

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[4] IPART, Review of Metropolitan Water Agency Prices, Issues Paper, July 2004

[5] Productivity Commission, Review of the National Access Regime, Inquiry Report

[6] IPART, NSW Electricity Distribution Pricing 2004/-5 to 2008/09 – Final Report, June 2004, Appendix 7

[7] ICRC, Final Report and Price Direction: Investigation into Prices for Water and Wastewater Services in the ACT, March 2004

[8] Productivity Commission, Review of the National Access Regime, Position Paper

Parameters

Risk Free Rate

The current yield on Treasury Capital Indexed bonds with a maturity of August 2015 is around 2.9 per cent. The equivalent yield on 10-year nominal bonds is around 5.5 per cent. The implied inflation forecast, using the Fisher Equation, is 2.5 per cent. These parameters are market based, and are likely to change prior to IPART's final determination.

Recommended Nominal Risk Free Rate	***5.5%***
Recommended Real Risk Free Rate	***2.9%***
Recommended Inflation Assumption	***2.5%***

Market Risk Premium (MRP)

Previously, IPART has concluded that there is no consensus on what the appropriate value of the MRP should be. Other Australian regulators universally adopt a MRP value of 6.0%.

In its recent *Electricity Distribution Pricing Determination*, IPART determined a MRP estimate of 5.0% to 6.0%, based on historical studies (rather than forward looking research). IPART undertook its own review of a range of historical studies of the MRP (see below) and concluded that an MRP derived from historical studies would be between 4.8% and 8.1%, implying a midpoint of 6.5%.

Therefore, consistent with historical estimates of the MRP and regulatory precedence in other jurisdictions, a minimum MRP value of 6% should be adopted by IPART.

Recommended Market Risk Premium	***6.0%***

Debt Margin

An approach that benchmarks the debt margin against capital markets based on an investment grade credit rating, 10-year debt maturity and 50 per cent gearing assumptions is supported. This is consistent with Treasury's Capital Structure policy that requires Government businesses to maintain a commercial capital structure and investment grade 'stand alone' credit rating. Standard & Poors defines 'investment grade' as BBB minus and above.[9] A debt margin range of 0.9 per cent to 1.1 per cent is considered to be appropriate, plus an additional 0.125 per cent for debt issuance costs. This range is consistent with that adopted by IPART in its recent *Electricity Distribution Pricing Determination*.

Recommended Debt Margin	***0.90% to 1.10% plus 0.125% for debt raising costs***

Debt Gearing

Debt gearing should be estimated with reference to efficiently financed commercial benchmarks, rather than the actual level of debt for the individual regulated utility. In past determinations, IPART has adopted a gearing ratio of 60 per cent for regulated water utilities, despite actual gearing levels of NSW water utilities being substantially lower.

Comparable listed water utilities in the U.K. and U.S. also generally have lower gearing levels than 60 per cent. Debt gearing levels of comparable water utilities demonstrate average gearing levels of around 45 per cent to 50 per cent. Accordingly it is recommended that a debt gearing level of 50 per cent be adopted by IPART for the purposes of calculating the regulatory WACC.

This is also consistent with debt gearing level adopted by the Queensland Competition Authority (QCA) in recent determinations. It should be noted that adoption of a 50 per cent versus 60 per cent gearing assumption has very little impact on the final WACC calculation.

Recommended Debt Gearing	***50%***

[9] Standard & Poors, Corporate Rating Criteria, 2002

Gamma

In previous water determinations, IPART has adopted a range of 0.3 to 0.5 for gamma (0.4 midpoint) noting the inconclusive nature of available research. In IPART's *Draft Electricity Distribution Pricing Determination*, IPART referred to market evidence suggesting that gamma should be zero. This view is supported by the Journal of Financial Economics, which has published a paper that suggests that for large Australian companies with significant foreign ownership, franking credits are effectively worthless to the marginal price-setting investor, at least since the introduction of the 45-day holding period rule made it more difficult to transfer these credits.

Given the inconclusive nature of available research, there does not appear to be any reason for IPART to increase gamma from the 0.3 to 0.5 range (0.4 mid-point) adopted in previous water determinations.

Recommended Gamma ***0.3 to 0.5***

Asset Beta

The appropriate asset beta for Australian water utilities has been reviewed in various Australian regulatory decisions over the past few years. In this regard, the asset beta range previously adopted by IPART is at the low end of ranges used by Australian regulators.

Regulator	Year	Asset Beta	Mid-Point
IPART	2000	0.30-0.45	0.375
QCA	2002-03	0.35-0.45	0.40
IPRC	2004	0.40	0.40
GPOC	2001	0.30-0.55	0.425

There are numerous areas of risk that may impact on the commercial viability of water utilities, including:

- drought, which adversely impacts cash flow both on the demand and supply side, for example:- restrictions and water conservation measures reduce revenues while the need to supplement supply infrastructure increases costs;
- changes in environmental conditions, for example:- possible changes to environmental flows or new standards for wastewater transport and handling, may impact both on revenues and costs;

IPART's *Issues Paper* identifies the potential revenue volatility associated with consumption forecasting and medium term price setting in the current environment of continued drought and water restrictions. Future demand management initiatives (including changes in price structures) and potential changes in environmental requirements will only further increase revenue volatility over the next regulatory period. Given that underlying costs are largely fixed, this translates to significant earnings risk for water utilities.

These risks were identified by the ICRC in its recent draft water determination for ACTEW. Based on this evidence, ICRC adopted a common asset beta of 0.40 and real pre-tax WACC of 7.0 per cent for both ActewAGL's electricity and water businesses.

Submissions made by both ACTEW (water) and ActewAGL (electricity), proposed an identical asset beta for the electricity and water/wastewater functions.

Therefore an asset beta range of 0.35 to 0.45 is proposed , consistent with both the asset beta range adopted for water utilities by interstate regulators and with the range adopted by IPART for electricity networks.

Recommended Asset Beta ***0.35 to 0.45***

Debt Beta

A debt beta range of zero to 0.6 is proposed consistent with that adopted in IPART's recent *Electricity Distribution Pricing Determination*. If the debt beta is used consistently in the de-levering and re-levering process, debt beta assumptions should not impact on the final equity beta adopted.

Recommended Debt Beta ***0.0 to 0.06***

Equity Beta

The equity beta is computed by levering the asset beta while controlling for the debt beta.

The continued use of the Monkhouse formula to calculate the equity beta is supported. Based the proposed gearing, asset beta and debt beta assumptions, the resultant equity beta is 0.63 to 0.89.

Recommended Equity Beta: 0.63 to 0.89

Proposed WACC Range

The proposed WACC parameters are tabled below. The resultant real pre-tax range is 6.1 per cent to 7.5 per cent. It is proposed that IPART adopt a WACC close to the mid-point of this range in order to determine the 'return on asset' building block revenue requirement. This is to enable an adequate cost of funds to be recovered and provide the appropriate incentive to invest in essential water infrastructure services.

	Lower Range	Upper Range
Nominal Risk Free Rate	5.5%	5.5%
Real Risk Free Rate	2.9%	2.9%
Inflation	2.5%	2.5%
Market Risk Premium	6.0%	6.0%
Debt Margin	1.025%	1.225%
Debt to Total Assets	50%	50%
Gamma	50%	30%
Tax Rate	30%	30%
Asset Beta	0.35	0.45
Debt Beta	0.06	0.00
Equity Beta	0.63	0.89
Cost of Equity	9.3%	10.8%
Cost of Debt	6.5%	6.7%
WACC (nominal post-tax)	6.1%	7.2%
WACC (real pre-tax)	**6.1%**	**7.5%**

Recommended Real Pre-tax WACC: 6.1% to 7.5%