Melbourne Water

2009 Water Plan

Victoria
The Place To Be

Melbourne Water

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All figures contained in the 2009 Water Plan are in real 2008/09 dollars, unless specified otherwise.

Overview

Melbourne Water is a water resource manager, providing water, sewerage and recycled water services to Melbourne's retail water businesses and waterways and regional drainage services to the greater Melbourne community. In doing so, we are committed to managing our business efficiently to achieve a vision of '*Working together to ensure a sustainable water future'*.

The 2009 Water Plan is submitted to the Essential Services Commission (the Commission) to meet Melbourne Water's requirements under its revised Statement of Obligations.[1] It summarises the outcomes, actions and expenditures that Melbourne Water will undertake, and the prices it proposes to charge over the 2009 regulatory period (2009/10 to 2012/13), for its water, sewerage and recycled water services.[2] Performance, and factors impacting performance, over the 2005 regulatory period (2005/06 to 2007/08) are also discussed.

The 2009 Water Plan has been prepared in a changing environment, characterised by climate uncertainty and drought. Average inflows to Melbourne's four major harvesting storages over the last 11 years (1997/98 to 2007/08) have been approximately 35% lower than the long term (1913/14 to 2007/08) average. Inflows for the 2007/08 financial year were 340 GL[3], 11% less than the average over the last 11 years and 42% less than the long term average.

The community has responded by reducing water consumption significantly and the Melbourne metropolitan water industry, in conjunction with the State Government, has implemented a range of contingency measures, including Stage 3a restrictions, to help save water. Notwithstanding this, water levels in storages have fallen significantly. At the end of October 2008, Melbourne Water's reservoirs were at 33.8% of capacity with Melbourne's largest water storage, the Thomson Reservoir, at 20.1% of capacity.

Within this context, responding to the immediate water supply needs and ensuring the long term security of Melbourne's water supply are key issues addressed by the 2009 Water Plan. As a result, in addition to other ongoing requirements such as infrastructure maintenance, renewal and population growth, Melbourne Water proposes to:

- Invest in additional sources of water to boost and diversify Melbourne's water supplies consistent with the State Government's *Our Water Our Future: the Next Stage of the Government's Water Plan* (the State Government's Water Plan) and the *Central Region Sustainable Water Strategy* (CRSWS). These projects include:
  - The Victorian Desalination Project, which will provide up to an additional 150 GL per year by the end of 2011. This project is being delivered by the Department of Sustainability and Environment as a Public Private Partnership (PPP) and is presently in the bidding phase[4]

[1] Melbourne Water's Statement of Obligations was revised on 30 October 2008.

[2] Waterways services were the subject of a separate process, with the 2008 Waterways Water Plan submitted to the Commission in December 2007.

[3] A gigalitre (GL) is equivalent to a billion litres.

[4] The 2009 Water Plan assumes the Victorian Desalination Project under the PPP arrangements will be operating expenditure for Melbourne Water. The Department of Sustainability and Environment tender process for the PPP is expected to be finalised by late 2009. The assumed annual payment obligations for the purposes of the 2009 Water Plan are working assumptions consistent with the 2007 Feasibility Study for the project.

  - Constructing the Sugarloaf Pipeline linking the Melbourne supply system to the Goulburn River, and contributing to the State Government's Food Bowl Modernisation project, to secure up to 75 GL per year for Melbourne by mid 2010
  - Constructing a water treatment plant at the Tarago Reservoir by mid 2009 which will add around 15 GL to annual supply
  - Upgrading the Eastern Treatment Plant to tertiary standard in 2012 to facilitate improved environmental outcomes and increase water recycling opportunities in the future.
- Maximise the yield of the existing water supply system to assist in maintaining storage levels until other major supply sources come on line.

In addition to securing future water supplies for Melbourne, Melbourne Water will:

- Achieve improved environmental outcomes for sewerage services through investment in higher levels of sewage treatment, particularly at the Eastern Treatment Plant with renewal of pre-treatment infrastructure and works to reduce odour, and reducing the potential for sewage spills, meeting EPA Victoria's requirements and the expectations of the community
- Maintain Melbourne Water's existing supply systems to continue to provide reliable, high quality and efficient wholesale water, sewerage and recycled water services to the retail water businesses
- Meet community, State Government and EPA Victoria expectations and requirements in relation to more sustainable service provision, including increasing use of renewable energy to reduce greenhouse gas emissions.

Delivery of the outcomes set out in the 2009 Water Plan will require a substantial increase in capital and operating expenditures. This reflects a significant change in Melbourne's water supply system, from one based on a few water sources which are highly capital intensive but have low operating costs (due to their natural advantages and water quality), to one based on a wider range of water sources that are both highly capital intensive, but also involve substantial operating costs. In essence, this reflects the fact that Melbourne can no longer rely to the same degree on the natural water system advantages it has always benefited from, and that the industry is moving onto a different cost structure.

A Capital Delivery Strategy has been developed to enable efficient delivery of the proposed capital program. Efficiency is driven by the competitive pressures of commercial negotiations, including through establishing alliances to deliver bundled groups of capital projects, and through the market testing, auditing and subcontracting mechanisms once the alliances are in operation. Economies of scale and scope are also derived from alliances, as is innovation through a collaborative environment and work processes.

In regard to Melbourne Water's operating expenditure, just under 80% is contracted out and therefore subject to competitive market processes and forces.

Increasing expenditures will lead to an increase in prices, both for Melbourne Water's customers – the retail water businesses – and the water consumer. Melbourne Water's wholesale prices to the retail water businesses are proposed to increase by inflation plus an average of 21.9% per year over the 2009 regulatory period. While the impact on individual customers will vary depending on their retail water business, and their own water use, Melbourne Water's proposed price increase translates to an approximate inflation plus 11% increase per year for households and businesses.

Overview

The proposed price increase is consistent with written advice from the Minister for Water relating to the working assumptions Melbourne Water should use in preparing its 2009 Water Plan. That is, in order to meet the State Government's pricing expectations (that the water consumer's average bill will approximately double, in real terms, by 2012), Melbourne Water should:

- Defer $135 million of regulatory depreciation to the next regulatory period starting 1 July 2013
- Transfer $300 million from Melbourne Water's Regulatory Asset Value to South East Water and City West Water
- Not carry forward losses or adjustments from prior years to the 2009 regulatory period, with the exception of efficient capital expenditure that can be rolled forward into the Regulatory Asset Value
- Adopt a real post-tax Weighted Average Cost of Capital of 5.8%.

The proposed price structures have been developed to ensure that they:

- Provide appropriate signals to customers about the costs of providing particular services and choices regarding alternative supplies for different purposes
- Create incentives for more sustainable and efficient resource use
- Take into account the interests of customers
- Are understandable to customers
- Are consistent with providing a sustainable revenue stream for regulated businesses.

In preparing the 2009 Water Plan, Melbourne Water has worked with its stakeholders to clarify future service and regulatory requirements, and consulted on the associated expenditures and proposed prices.

Chapter 1

Executive summary

1.1 Background and industry context

1.1.1 Melbourne Water

Melbourne Water is a statutory corporation, fully owned by the Victorian State Government.

Melbourne Water is a water resource manager, providing water, sewerage and recycled water services to Melbourne's retail water businesses and waterways, and regional drainage services to the greater Melbourne community.

Melbourne Water is Victoria's largest urban water business, providing around 60% of the State's urban potable water, and 16% of total water supplied in Victoria for urban and rural purposes. Melbourne Water currently provides wholesale water services to five retail water businesses. It also currently treats around 270 GL of sewage collected by the three metropolitan retail water businesses, of which approximately 23% is recycled.

1.1.2 Regulatory framework

As economic regulator for the Victorian water industry, the Commission is responsible for determining prices and overseeing the service standards to be achieved by each of the State's urban and rural water businesses. The Commission makes its determination taking account of proposals put forward by water businesses as well as the input of the community and State Government, who are consulted throughout the water planning process.

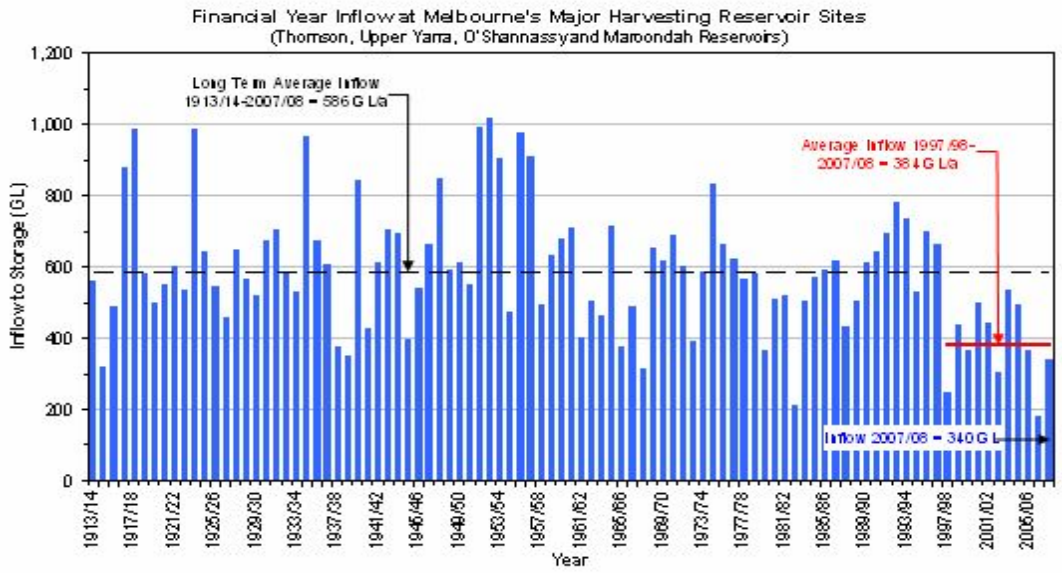
The Water Industry Regulatory Order sets out which services are to be regulated and provides guidance to the Commission on how economic regulation should be applied. Each water business's Statement of Obligations defines the content and timing of the price and service proposals put forward by water businesses. The 2009 Water Plan meets the procedural requirements specified in Melbourne Water's revised Statement of Obligations.

The proposals summarised in this document have been developed in consultation with Melbourne Water's customers, stakeholders and regulators including the retail water businesses, the Department of Sustainability and Environment, EPA Victoria, the Department of Human Services and the Minister for Water.

1.1.3 Operating environment

Melbourne Water's 2009 Water Plan has been prepared in a changing and uncertain environment. Lower rainfall has resulted in a significant reduction in inflows to Melbourne Water's reservoirs. Inflow to Melbourne's four major harvesting storages for 2006/07 was the lowest on record and for 2007/08 was 340 GL, 11% less than the average over the last 11 years (1997/98 to 2007/08), and 42% less than the long term average. The current conditions are without precedent in the history of water supply to Melbourne. This is illustrated in Figure 1.1.

Figure 1.1: Melbourne Water inflow to storages – 1913/14 to 2007/08



Storage inflows have dropped significantly

The community has responded well, changing water use behaviour significantly and reducing per capita consumption by almost 35% on 1990's consumption levels. However, this behavioural change, along with increased water restrictions since September 2006, and a range of contingency measures implemented by the water businesses, has not fully offset the significant reduction of inflows and Melbourne Water's storages continue to fall.

In addition to its impact on the broader community, recent climatic conditions have also impacted on Melbourne Water's financial performance. Lower demands mean Melbourne Water's combined water and sewerage revenue for the 2005 regulatory period was approximately 8.5% lower than allowed for in the Commission's 2005 Price Determination. Additional expenditures have also been required to maximise the yield of the water supply system (e.g. installation of additional pumps at Yering Gorge Pump Station).

Implications for the future

Climate change has also influenced future resource planning. The *Central Region Sustainable Water Strategy* (CRSWS), released in October 2006, set the agenda for future water resource management, taking into account expected climate change impacts and water reserves at that time, as well as the potential impacts of ongoing lower streamflow conditions.

In June 2007, in response to continuing drought and further reductions in water reserves, *Our Water Our Future: the Next Stage of the Government's Water Plan* (the State Government's Water Plan) was released. It considered the implications of a repeat of average storage inflows over the last 100, 10 and 3 years and concluded that, while a repeat of the last three years (2004 to 2006) was a relatively unlikely event "*Our planning must enable us to deal with very low inflows. When it comes to water, being risk averse and prudent makes good sense.*"[5]

[5] *Our Water Our Future, the Next Stage of the Government's Water Plan,* Victorian Government, June 2007, p 22.

The State Government's Water Plan identifies a range of system augmentations that will increase water security by diversifying and boosting water supplies and networking the State's water resources in a Victorian Water Grid. Melbourne Water will make a major contribution to implementing the State Government's Water Plan through:

- Payment obligations in relation to the Victorian Desalination Project, which will provide up to an additional 150 GL per year by the end of 2011. This project is being delivered by the Department of Sustainability and Environment as a PPP and is presently in the bidding phase
- Constructing the Sugarloaf Pipeline linking the Melbourne supply system to the Goulburn River, and contributing to the State Government's Food Bowl Modernisation project, to secure up to 75 GL per year for Melbourne by mid 2010
- Constructing a water treatment plant at the Tarago Reservoir by mid 2009 which will add around 15 GL to annual supply
- Upgrading the Eastern Treatment Plant to tertiary standard in 2012 to facilitate improved environmental outcomes relating to marine discharge impacts[6] and increased water recycling opportunities in the future.

The expenditures associated with these augmentation projects are large. About $816 million will be invested by Melbourne Water in constructing the Sugarloaf Pipeline and upgrading the Eastern Treatment Plant to tertiary standard over the 2009 regulatory period.[7] In addition, a significant increase in operating expenditure will be incurred to fund and operate the four new augmentations, detailed above, over the 2009 regulatory period. This includes payment obligations for the Victorian Desalination Project, under the assumed PPP arrangements.[8]

1.2 Progress over 2005 regulatory period

Melbourne Water has achieved a high level of compliance with the targets included in the Commission's 2005 Price Determination. These standards were based on the best available information at that time. Significant and unexpected changes in circumstances, as described above, have presented a challenging environment in which to meet these benchmarks. Despite this, Melbourne Water has continued to provide high quality services. Its capital and operating costs also continue to be efficient, reflecting new information about asset condition, the operating environment and the impact of changing market conditions.

1.2.1 Service outcomes

Melbourne Water achieved its required service outcomes over the 2005 regulatory period, with a few exceptions, most significantly in relation to biosolids reuse. No progress was made towards the biosolids reuse targets at the Eastern or Western Treatment Plants over the 2005 regulatory period. The loss of soil blending opportunities at the Eastern Treatment Plant, and additional information on the composition of biosolids at both plants, has necessitated a revision of Melbourne Water's 2002 biosolids strategy.

The revised strategy positions Melbourne Water to progressively achieve EPA Victoria expectations in relation to the sustainable management of biosolids. It identifies

[6] Specifically, marine discharge impacts at Boags Rocks (as required by the EPA Victoria discharge licence and current EPA Victoria Works Approval).

[7] The capital expenditure does not include the Tarago water treatment plant, which will be delivered before the 2009 regulatory period, or the Victorian Desalination Project which it is assumed will be delivered as a PPP and therefore service payments under the PPP arrangements will be operating expenditure for Melbourne Water.

[8] Final contractual arrangements for the PPP are not expected to be known until late 2009.

construction fill as the preferred use of the clay rich biosolids from the Eastern Treatment Plant and a waste to energy recovery project as the preferred use of biosolds from the Western Treatment Plant. However, the additional research undertaken as part of the revised strategy also established that available reuse opportunities are often infrequent, large and have high costs, resulting in periodic changes in performance rather than annual increments.

1.2.2 Demand outcomes

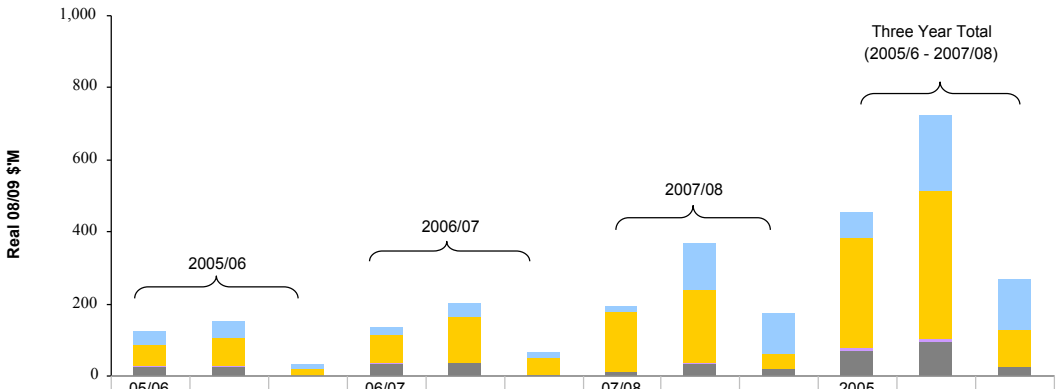
Higher than anticipated water supply restrictions, as well as the community's significant efforts to conserve water meant actual water demand over the 2005 regulatory period was 211 GL or 14.5% lower than that reflected in the Commission's 2005 Price Determination. Sewage volumes received at Melbourne Water's treatment plants were 164 GL or 16.3% lower than that reflected in the Commission's 2005 Price Determination. This was largely a result of lower indoor water use, increased grey water recycling and lower inflow and infiltration into Melbourne Water's and the retail water businesses' sewerage systems.

In contrast to water and sewage demand, drought and low availability of water from other sources has contributed to a significant increase in the demand for recycled water. For example, recycled water used by Melbourne Water on-site at Western Treatment Plant and Eastern Treatment Plant, and supplied by Melbourne Water to the retail water businesses for off-site projects, increased from 43.8 GL in 2005/06 to 62.0 GL in 2007/08 (excluding environmental flows).

1.2.3 Capital expenditure outcomes

Overall, capital expenditure in the 2005 regulatory period was $269.1 million higher than that allowed by the Commission in its 2005 Price determination. This is illustrated in Figure 1.2.

Figure 1.2: Total capital expenditure – 2005/06 to 2007/08



	05/06 Water Plan	05/06 Actual	05/06 Variance	06/07 Water Plan	06/07 Actual	06/07 Variance	07/08 Water Plan	07/08 Actual	07/08 Variance	2005 Water Plan	Actual Total	Variance Total
Water	35.3	48.3	13.0	21.4	38.0	16.6	16.5	127.1	110.6	73.2	213.3	140.1
Sewerage	58.5	77.0	18.4	81.0	125.0	44.0	165.8	206.0	40.2	305.3	408.0	102.7
Recycled Water	3.1	4.8	1.7	4.0	2.0	-2.0	0.0	0.4	0.4	7.1	7.2	0.1
Corporate allocation	25.1	24.2	-0.9	31.2	36.9	5.7	13.6	34.9	21.3	69.9	96.0	26.1
Total	**122.0**	**154.3**	**32.3**	**137.6**	**201.9**	**64.2**	**195.8**	**368.3**	**172.5**	**455.4**	**724.5**	**269.1**

Capital expenditure is higher than provided for in the Commission's 2005 Price Determination

New obligations which have come into effect since 1 July 2005, and which were not part of the 2005 Water Plan, include:

- The design and construction of the Sugarloaf Pipeline connecting the Melbourne supply system to the Goulburn River, consistent with the State Government's Water Plan
- Bringing forward the reconnection of Tarago Reservoir, and construction of a water treatment plant, consistent with the CRSWS.

Major contributors to the increase in business as usual expenditure over the 2005 regulatory period include increases in the Western and Eastern Treatment Plant capital expenditure, as well as increases in planned expenditure on the Northern Sewerage Project. These increases have also been partly offset through project reprioritisation and deferral.

Melbourne Water has systems in place to monitor actual capital expenditures and ensure that project priorities and timing reflect updated information. It has drawn on its experience over the 2005 regulatory period, as well as the results of benchmarking and independent reviews, to improve its capital planning and delivery processes to deliver future requirements on time and on cost.

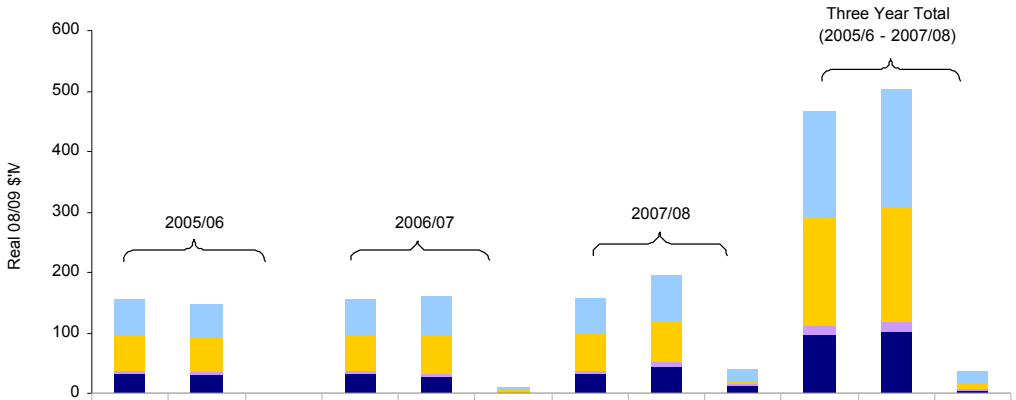
1.2.4 Operating expenditure outcomes

Overall, operating expenditure in the 2005 regulatory period was $36.5 million higher than that allowed in the Commission's 2005 Price Determination. This is illustrated in Figure 1.3.

Additional operating expenditure was incurred due to new obligations. This includes investigations to examine large scale alternative sources of water supply options, identified in the CRSWS, and design studies for the Victorian Desalination Project and Sugarloaf Pipeline, in accordance with the State Government's Water Plan.

Major contributors to the increase in business as usual expenditure over the 2005 regulatory period include increased labour costs and increased expenditure on maintenance. These increases in operating expenditure have been partially offset by savings, including as a result of favourable market conditions e.g. reduced insurance costs.

Figure 1.3: Total operating expenditure – 2005/06 to 2007/08



	05/06 Water Plan	05/06 Actual	05/06 Variance	06/07 Water Plan	06/07 Actual	06/07 Variance	07/08 Water Plan	07/08 Actual	07/08 Variance	2005 Water Plan	Actual Total	Total Variance
Water	58.2	53.8	-4.4	58.9	62.8	3.9	58.2	78.0	19.8	175.3	194.6	19.3
Sewerage	59.3	59.5	0.2	59.8	65.2	5.4	61.8	66.2	4.4	180.9	190.9	10.0
Recycled Water	5.9	5.8	-0.1	4.5	4.8	0.3	4.5	6.1	1.6	14.9	16.7	1.8
Corporate	31.9	29.1	-2.8	31.8	27.3	-4.4	32.8	45.4	12.6	96.5	101.9	5.4
Total	155.2	148.2	-7.1	155.0	160.1	5.2	157.4	195.8	38.4	467.6	504.1	36.5

Operating expenditure is higher than provided for in the Commission's 2005 Price Determination

1.2.5 New obligations

As outlined above, new legislative and regulatory obligations have come into effect since 1 July 2005 which were not in Melbourne Water's 2005 Water Plan. As a result, operating costs increased by $12.9 million over the 2005 regulatory period, while the additional capital expenditure resulted in unfunded financing costs of $2.1 million.

The current regulatory framework provides for the recovery of this additional expenditure where it passes a materiality threshold set at the greater of 2.5% of revenue or $1 million. For Melbourne Water, this threshold is approximately $42 million over the 2005 regulatory period. Melbourne Water notes that despite delivering the outcomes required by these new obligations, it will not be able to recover these additional costs incurred within the 2005 regulatory period.

1.3 Proposals for the 2009 regulatory period

1.3.1 Regulatory framework

The Minister for Water has advised Melbourne Water of the working assumptions it should use in preparing the 2009 Water Plan. In particular, that Melbourne Water should:

- Defer $135 million of regulatory depreciation to the next regulatory period starting 1 July 2013
- Transfer $300 million from Melbourne Water's Regulatory Asset Value to South East Water and City West Water
- Not carry forward losses or adjustments from prior years to the 2009 regulatory period, with the exception of efficient capital expenditure that can be rolled forward into the Regulatory Asset Value
- Adopt a real post-tax Weighted Average Cost of Capital of 5.8%.

Melbourne Water notes that, following the Commission's review of the 2009 Water Plan, as well as those of the retail water businesses, and any further information presented to the Commission, the working assumptions included in the 2009 Water Plan may be revised.

Melbourne Water supports prices being set via independent economic regulation. This provides a transparent approach to price setting. A four year regulatory period ensures the costs associated with economic regulation are minimised and the incentives for improved performance are strengthened. However, it will be important that the framework for economic regulation provides sufficient mechanisms to enable water businesses to deal with the uncertainties that may arise over the period. It is likely that the uncertainties faced in the 2005 regulatory period will also exist in the 2009 regulatory period.

In order to adequately manage uncertainty and ensure optimal risk allocation, Melbourne Water considers the regulatory framework needs to incorporate the following features:

- For certain, specified major projects, a within-period review and pass through process to examine the costs of those projects for inclusion in relevant prices
- A cumulative, end-of-period, pass through mechanism for additional and new legislative or regulatory obligations that are unforeseen, and which arise once the 2009 regulatory period has commenced
- An annual assessment of actual water demands and sewage volumes and loads to establish whether there are material variations with the estimates used by the Commission in its final decision, along with necessary adjustments to prices.

1.3.2 Service outcomes

The outcomes to be delivered over the 2009 regulatory period arise through a combination of regulatory obligations, customer service requirements and State Government policy requirements. They are also driven by changes in water demand, sewage volumes and pollution loads, population growth and uptake of recycled water.

Melbourne Water has engaged in ongoing consultation with its customers and stakeholders in relation to the obligations and activities detailed below.

Table 1.1 provides a summary of the key Government, regulatory and customer service requirements and associated outcomes driving increases in Melbourne Water's proposed expenditures and prices over the 2009 regulatory period.

Table 1.1 – Key requirements and outcomes over the 2009 regulatory period

Area	Regulatory instrument	Nature	Requirement	Outcome to be delivered
Water management	Statement of Obligations	New	Manage the water supply and demand balance to ensure demand can be met for a minimum of 7 years and develop a program of works or initiatives that is consistent with the CRSWS (and the State Government's Water Plan) to secure water supplies beyond 7 years	Secure additional water by the end of 2011 via the Victorian Desalination Project[9] Secure additional water by mid 2010 via construction of the Sugarloaf Pipeline and contributions to the Food Bowl Modernisation Project Bring Tarago Reservoir back on line by mid 2009
Water quality	Safe Drinking Water Act Bulk Water Supply Agreements	Business as usual	Supply water that complies with the requirements in the Safe Drinking Water Act and the Bulk Water Supply Agreements	Implement open catchment area works involving drinking water quality investigations Undertake Yarra Glen and Healesville disinfection by-product works
Sewage spills	State Environment Protection Policy (Waters of Victoria)	Business as usual	Hydraulic capacity of new sewers to contain flows associated with up to a one-in-five year rainfall event and existing sewers to be progressively upgraded to this standard	Progressively achieve 0 spills due to storm events of a severity of up to one-in-five years by completing stage 2 of Melbourne Water's Spills Abatement Program which includes the Northern Sewerage Project
	State Environment Protection Policy (Waters of Victoria)	Business as usual	Sewerage system be managed so that spills due to system failure do not occur	0 spills due to pump station failure or sewer failure through Melbourne Water's ongoing renewal and maintenance program which includes replacement of the Melbourne Main Sewer
Sewerage treatment and disposal	EPA Victoria discharge licence State Environment Protection Policy (Waters of Victoria) EPA Victoria Works Approval Environment Protection Act 1970 Statement of Obligations	Business as usual	Ensure the program of works meets the requirements of the EPA Victoria licence, and the current Works Approval, for the Eastern Treatment Plant, to improve effluent quality and address marine discharge impacts at Boags Rocks and is consistent with the CRSWS (and State Government's Water Plan) to upgrade the treatment process at the Eastern Treatment Plant to achieve Class A recycled water standards to facilitate increased water recycling opportunities	Upgrade the Eastern Treatment Plant to tertiary standard by 2012

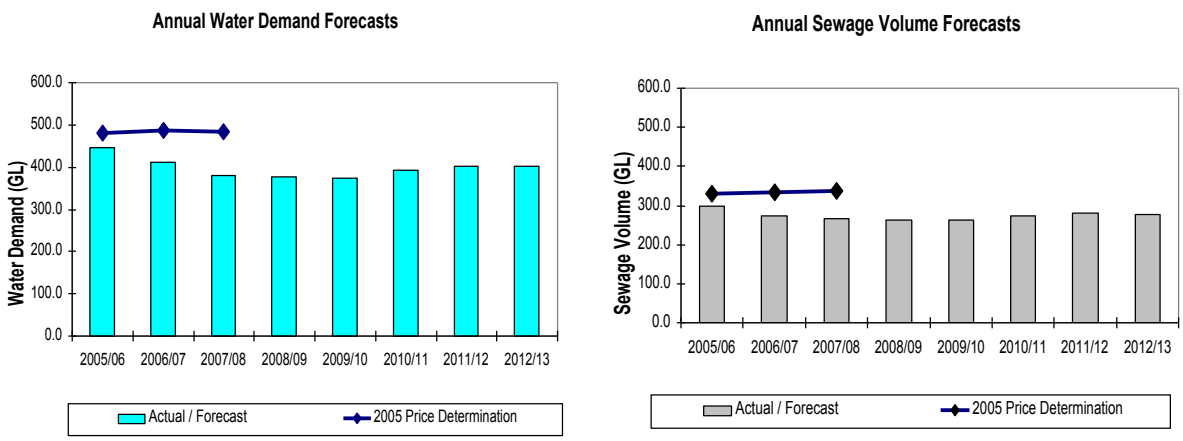
[9] As previously noted, it has been assumed the Victorian Desalination Project will be delivered as a PPP and that service payments under the PPP arrangements will be operating expenditure for Melbourne Water.

Area	Regulatory instrument	Nature	Requirement	Outcome to be delivered
	EPA Victoria discharge licence	Business as usual	Comply with discharge licence performance limits for the Eastern Treatment Plant	Meet discharge licence requirements for the Eastern Treatment Plant including pre-treatment infrastructure renewal and odour reduction works
	EPA Victoria discharge licence	Business as usual	Comply with discharge licence performance limits for the Western Treatment Plant	Meet discharge licence requirements for the Western Treatment Plant including sludge processing and handling works, wet weather capacity upgrades and odour reduction works
Biosolids	EPA Victoria discharge licence	Business as usual	Maximise the reuse of biosolids	Biosolids reuse of 90,000 cubic metres at the Eastern Treatment Plant for construction fill by 2013 along with pursuing reuse opportunities for biosolids at the Western Treatment Plant
Recycled water	Statement of Obligations	New obligation	Potable substitution targets for greater Melbourne of a minimum of 6.2 GL per year by 2015	Contribute 964 ML per year of recycled water to the 6.2 GL potable substitution target by 2013
Sustainable management	Statement of Obligations	New obligation	Apply Sustainable Management Principles in performing its functions and develop and implement programs for assessing, monitoring and continuously improving its performance	Reduce greenhouse gas emissions by 40% of Melbourne Water's 2000/01 emissions by 2013 61% of total energy used or exported is from renewable sources by 2013

1.3.3 Forecast demands

The proposed demand forecasts have been developed in consultation with the retail water businesses. The proposed demands are lower than the levels included in the Commission's 2005 Price Determination but reflect a continuation of trends observed over recent years (see Figure 1.4). The proposed forecasts are consistent with the expected impact of water restrictions, higher prices, as well as measures to achieve targets set out in the CRSWS.

Figure 1.4: Total forecast water demand and sewage volumes – 2005/06 to 20012/13



At an aggregate level, volumes are expected to continue recent trends

City West Water, South East Water and Yarra Valley Water have all forecast increases in water volumes over the 2009 regulatory period, reflecting an assumed gradual lifting of restrictions. South East Water's water demand increases at a faster rate than the other two retail water businesses due to different approaches in the modelling of savings under restrictions, as well as assumed rates of household and population growth. South East Water has also forecast an increase in sewage received, while Yarra Valley Water and City West Water are predicting stable sewage volumes. In establishing their demand forecasts the retail water businesses have used census data, Department of Planning and Community Development projections and regression analysis to forecast household and population growth.[10]

Annual recycled water demands are forecast to remain relatively stable over the 2009 regulatory period. Demand for recycled water from the Eastern Treatment Plant is expected to remain constant at 6.6 GL per year. At the Western Treatment Plant, recycled water demands are forecast to decrease slightly from 12.7 GL in 2009/10 to 12.1 GL in 2012/13. This reflects assumed reductions in Southern Rural Water's demands, as it returns to its contracted levels of supply,[11] as well as slight increases in demand from City West Water for its West Werribee dual pipe project.

1.3.4 Planning processes

Melbourne Water's planning processes are integrated, robust and take explicit account of customer and stakeholder interests.

Melbourne Water's proposed outcomes and expenditure for the 2009 regulatory period have been developed through Melbourne Water's Planning Framework. This ensures alignment with Government policy priorities, customer needs, regulator requirements and prudent risk management. It also ensures alignment between long term planning and day to day operational considerations and factors in broader economic, social and environmental considerations as well as achieving continuous improvement.

Melbourne Water's vision, sustainability principles, values and goals are outlined in *Sustainable Water* - A *Strategic Framework*. This framework ensures Melbourne Water's long-term objectives are aligned to State Government policy platforms including *Our Water Our Future,* the CRSWS*, Our Environment Our Future* and *Melbourne 2030.*

Detailed capital and operating expenditure plans support delivery of short and medium term targets set out in annual Corporate Plans and periodic Water Plans.

Melbourne Water has a comprehensive Asset Management System that involves appropriate planning throughout the asset lifecycle. The Asset Management System links to the Corporate Plan and Strategic Framework and achieves business performance targets for built assets using sustainable management principles.

[10] Updated *Victoria in the Future* population growth projections are yet to be released.

[11] Recycled water above contracted levels of supply is assumed in 2009/10 due to the ongoing drought.

Regular review and continuous improvement are an integral part of Melbourne Water's Planning Framework. Since 2005, Melbourne Water has undertaken reviews and benchmarking studies with a view to strengthening its capital planning and delivery processes and systems. The results of these reviews are progressively being implemented and include strengthened governance arrangements through the establishment of a Board committee on capital planning and delivery. In addition, planning improvements include:

- A more rigorous program and project proposals review/challenge process
- An enhanced approvals process based on business case gates supported by a workflow system
- A streamlined planning and delivery process for low risk high volume works
- Improved cost estimation methodologies for high value/high risk projects
- Improved renewals planning and modelling to forecast future expenditures
- Introduction of Triple Bottom Line guidelines for evaluating expenditure proposals
- Progressive development of an improved project prioritisation process
- Increased emphasis on improved stakeholder engagement and relationship management.

1.3.5 Capital expenditure

The capital investment profile for the water industry can be highly variable. This is particularly the case for Melbourne Water, where the capital program often includes very large 'one off' projects. This is primarily related to factors such as compliance with changing regulatory obligations, peaks caused by ageing assets and significant irregular investments.

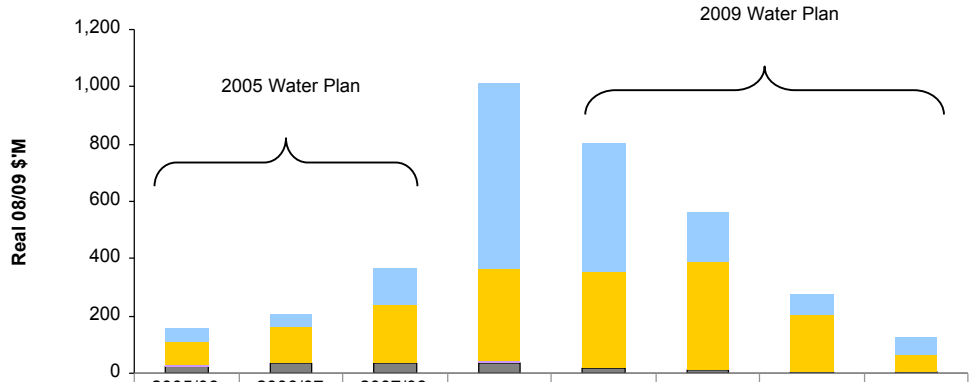
Planned investment over the 2009 regulatory period totals approximately $1.8 billion (Figure 1.5). Four major capital project totalling approximately $1.1 billion account for around 65% of total planned expenditure. The expenditures for two of these projects have been profiled to implement the State Government's Water Plan and the CRSWS. In particular, the Sugarloaf Pipeline, which is a new obligation, and the upgrade of Eastern Treatment Plant to tertiary treatment.[12] In addition, the Northern Sewerage Project is required to ensure compliance with EPA Victoria's sewer spills and licence discharge requirements and the Melbourne Main Sewer ensures the replacement of critical, ageing infrastructure. Completion dates for these projects are essentially fixed by policy commitments or regulatory obligations.

Asset renewals are increasing and significant over the 2009 regulatory period, totalling $551.3 million.[13] These are planned following risk-based condition assessments and predictive modelling of future asset replacements beyond 2008/09. They also reflect a small number of infrequent projects.

[12] As noted previously, it is assumed the Victorian Desalination Project will be delivered through a PPP and the Tarago water treatment plant will be completed in 2008/09. Also, the tertiary treatment upgrade is classed as sewerage expenditure, but will facilitate future water recycling opportunities.

[13] This includes the Melbourne Main Sewer Augmentation, which is also a renewal project.

Figure 1.5: Actual and forecast capital expenditure – 2005/06 to 2012/13



	2005/06 Actual	2006/07 Actual	2007/08 Actual	2008/09	2009/10	2010/11	2011/12	2012/13
Water	48.3	38.0	127.1	652.3	453.2	176.9	74.1	58.2
Sewerage	77.0	125.0	206.0	324.5	334.6	377.9	195.8	60.7
Recycled Water	4.8	2.0	0.4	0.6	0.2	0.3	0.2	0.3
Corp Allocated Overhead	24.3	36.9	34.9	38.6	17.5	9.3	7.3	8.0
Total	154.4	201.9	368.4	1,016.0	805.5	564.4	277.4	127.2

Capital expenditure is forecast to increase significantly. Four projects account for 65% of Melbourne Water's forecast capital expenditure

Melbourne Water recognises the challenge of delivering a much larger investment program in a highly competitive contracting market. In early 2007, it consulted water and construction industry participants on its proposed capital expenditure. The feedback was that the proposals were ambitious, but achievable. In response, Melbourne Water engaged consultants to help develop and validate a Capital Delivery Strategy and improve its planning processes (as outlined above) to ensure that resources are available, and systems in place, to deliver the proposed capital expenditure program efficiently. Over the past 12 months, the Contract Delivery Strategy has been implemented and involves:

- Choosing contract and delivery strategies appropriate to the size, complexity and risk of individual projects and which represent a sustainable business proposition to the market that ensures resources are retained to enable delivery
- Adopting a more collaborative approach to project delivery through the use of alliances, which enable co-location and resource certainty – five alliances have been mobilised and have commenced delivery
- Developing close working relationships with key stakeholders to negotiate optimum solutions and timely approvals
- Establishing an internal project control function to improve project scoping, scheduling and approvals for efficient and timely transition of projects from planning to construction
- Increasing the number and skills of internal Project Managers
- Enhancing the processes and information technology systems that support the capital planning and delivery process e.g. the Capital Management System.

The Capital Delivery Strategy will enable delivery of the proposed capital expenditure program and also ensure outcomes are achieved in an efficient manner. Efficiency is driven by the competitive pressures of commercial negotiations, including through establishing alliances and through the market testing, auditing and subcontracting mechanisms once the alliances are in operation. Economies of scale and scope are also derived from the alliances, as is innovation through a collaborative environment and work processes.

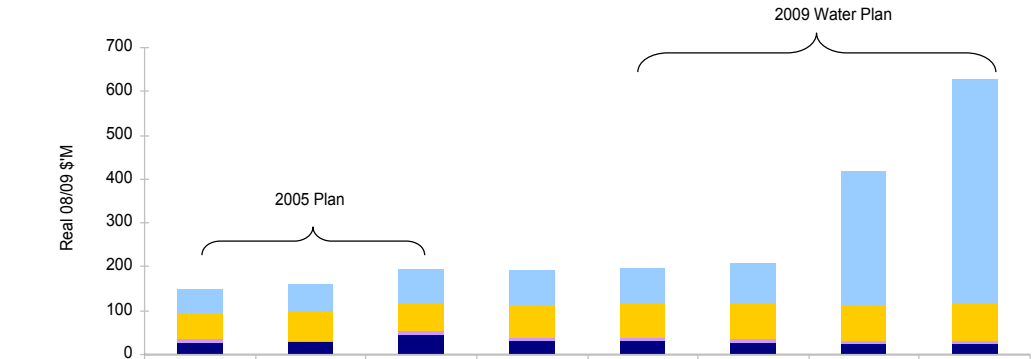
Melbourne Water is also confident that the successful delivery of the capital program can be achieved based on:

- Melbourne Water's successful track record in delivering its capital expenditure program over the past five years during which time capital expenditure has nearly doubled
- The fact that three of the major capital projects (Sugarloaf Pipeline, Northern Sewerage Project and Melbourne Main Sewer), which make up approximately 50% of planned expenditure over the 2009 regulatory period, have now progressed to construction
- The proven ability of the market to increase supply of engineering construction services. This is demonstrated by the mobilisation and co-location of resources to deliver the major projects that have now progressed to construction.

1.3.6 Operating expenditure

Forecast operating expenditure over the 2009 regulatory period totals around $1.4 billion. The proposed operating expenditure is illustrated in Figure 1.6.

Figure 1.6: Actual and forecast operating expenditure – 2005/06 to 2012/13



	2005/06 Actual	2006/07 Actual	2007/08 Actual	2008/09	2009/10	2010/11	2011/12	2012/13
Water	53.8	62.8	78.1	76.9	81.3	91.3	301.4	510.4
Sewerage	59.5	65.1	66.2	73.0	77.9	80.9	82.5	85.9
Recycled Water	5.8	4.8	6.1	8.1	8.0	7.6	7.3	7.3
Corporate	29.1	27.3	45.4	32.2	30.3	29.4	24.4	24.2
Total	148.2	160.1	195.8	190.2	197.6	209.2	415.6	627.7

Operating expenditure is forecast to increase significantly, largely due to operating the new water supply augmentations

Business as usual operating expenditure is forecast to remain relatively stable over the 2009 regulatory period, while expenditure associated with new obligations is expected to grow, largely as a result of the new water supply augmentation projects. In particular, significant operating expenditure is planned to meet the new obligations relating to managing the water supply and demand balance:

- Payment obligations in relation to the Victorian Desalination Project
- Operating the Sugarloaf Pipeline
- Operating the Tarago water treatment plant.

Over the 2009 regulatory period, market-determined price increases will impact on Melbourne Water's operating expenditure estimates for both new obligations and business as usual activities. In particular, it is anticipated that there will be industry wide increases in contract electricity prices which have been independently forecast to increase, relative to 2007/08, by more than 15% (over 2008/09 and the 2009 regulatory period).

Significant contributors to business as usual operating expenditure include maintaining an asset base that is expanding in size and complexity and achieving improved compliance with respect to the sustainable management and reuse of biosolids. Land tax costs are also increasing due to projected increases in the unimproved value of land. The increases in business as usual activities have been partially offset by expected decreases in expenditures associated with:

- The use of renewable energy from the mini-hydros to replace higher cost retail electricity supplies from the grid and the proposed treatment of mini-hydros as 'regulated business'
- Estimated cost savings from shared service and coordinated procurement arrangements with the retail water businesses.[14]

Approximately 78% of Melbourne Water's operating expenditure is contracted out and therefore subject to competitive market forces. Melbourne Water has strong contract management processes in place to ensure expenditures are efficient and delivery is timely.

Growth adjusted business as usual operating expenditure reflects the Commission's expectation of at least a real 1% per annum productivity saving and takes account of planned initiatives to streamline business processes and resource use, apply research, and technological developments and savings through contract renegotiations.

1.3.7 Regulatory asset value and depreciation

Melbourne Water's rolled forward Regulatory Asset Value as at 1 July 2009 is approximately $4.1 billion. This figure reflects the working assumptions provided by the Minister for Water in preparing the 2009 Water Plan, including reducing the Regulatory Asset Value by $300 million and deferring depreciation of $135 million, as well as Melbourne Water's actual capital expenditure in 2007/08 and proposed capital expenditure in 2008/09.

1.3.8 Cost of capital

The Commission includes a fair commercial return in the prices as measured by its assessment of the Weighted Average Cost of Capital. Melbourne Water has used a real post-tax Weighted Average Cost of Capital of 5.8%, as advised by the Minister for Water in the working assumptions provided for preparing the 2009 Water Plan.

[14] These estimates are preliminary and will be refined as the Melbourne water industry works together to determine the optimal way in which to meet the State Government's requirement of pursuing savings.

1.3.9 Required revenue

Melbourne Water's proposed revenue requirement over the 2009 regulatory period is approximately $2.9 billion. This reflects the working assumptions Melbourne Water has included in the 2009 Water Plan, as well as the effects on demand of drought, water restrictions and State Government water conservation targets. It also reflects the proposed increases in capital and operating expenditure required to comply with existing and new obligations. This proposed revenue requirement corresponds to a smoothed price path of CPI+ 21.9% per annum for wholesale water and sewerage services.

1.3.10 Prices

Melbourne Water's proposed water and sewerage prices continue the price reforms commenced over the 2005 regulatory period. The proposed prices have been developed in consultation with the State Government, the Commission and retail water businesses. They support State Government policy objectives and are consistent with Water Industry Regulatory Order. They also adopt the cost allocation approach consistent with the State Government's response to the Victorian Competition and Efficiency Commission's final recommendations in relation to the reform of the metropolitan retail water sector. The proposed prices for 2009/10 are detailed in Appendix 5.

Water services

Melbourne Water proposes to retain the existing structure of bulk water prices where separate usage and service prices are levied for headworks and transfer services. Prices have been revised in light of Melbourne Water's forward expenditures and the Commission's approach to calculating long run marginal cost.

Melbourne Water proposes that individual price caps be applied to regulate water prices over the 2009 regulatory period. This means that prices will be escalated annually by applying the 'CPI+/-X' formula. It is also proposed that there would be an annual assessment of demands, and potential for prices to be adjusted at the time of the annual price review, where there are material differences between actual and forecast demands.

Sewerage services

Melbourne Water proposes to refine pollution load prices for sewerage services to provide better signals on the costs and risks of managing waste, which will assist more efficient and sustainable sewerage system use by customers, as well as improved investment decisions by Melbourne Water and its customers.

Extensive analysis and consultation with the retail water businesses has led to two proposed changes. In particular, that the existing Total Nitrogen price will be changed to a price for Total Kjeldahl Nitrogen and the existing Total Dissolved Solids price will be changed to an Inorganic Total Dissolved Solids price. For Inorganic Total Dissolved Solids the change in specification of the price to Inorganic Total Dissolved Solids is consistent with customer feedback.

Usage prices for the load parameters are based on estimates of long run marginal costs, with separate prices for the Eastern and Western systems reflecting their different costs. Melbourne Water also proposes to increase its current salt price to better signal the future cost of growth in salt loads and increase the rewards associated with salt load reductions. Mindful of customer impacts, it is proposed to transition to this cost reflective price over the 2009 and 2013 regulatory periods.

Melbourne Water proposes that individual price caps be applied to regulate sewage volume and pollution load prices over the regulatory period. This means that prices will be escalated annually by applying the 'CPI+/-X' formula[15].

Water and sewerage customer impacts

Tables 1.2 and 1.3 outline the customer impacts in 2009/10 as a result of moving to the prices proposed for water and sewerage services.

Table 1.2: Customer impacts in 2009/10 – City West Water, South East Water and Yarra Valley Water

	City West Water		South East Water		Yarra Valley Water	
Revenue from prices	Current ($M/yr)	Proposed ($M/yr)	Current ($M/yr)	Proposed ($M/yr)	Current ($M/yr)	Proposed ($M/yr)
Total – water and sewerage	114.8	135.7	160.6	203.4	185.0	219.2
Change ($M)		20.9		42.8		34.2
Change (%)		18.2%		26.6%		18.5%

Table 1.3: Customer impacts in 2009/10 of proposed prices – Western Water and Gippsland Water

	Western Water		Gippsland Water	
Revenue from prices	Current ($M/yr)	Proposed ($M/yr)	Current ($M/yr)	Proposed ($M/yr)
Total – water	7.1	8.9	0.028	0.029
Change ($M)		1.8		0.001
Change (%)		24.5%		4.4%

Beyond 2009/10, Melbourne Water is proposing a CPI+/-X price path for the metropolitan retail water businesses which will see prices increasing each year by 21.9%. Western Water's and Gippsland Water's proposed path paths are 24.5% and 16.4% respectively, reflecting their average, water only, price increase.

Recycled water services

Melbourne Water supports the continued use of pricing principles in setting wholesale prices for recycled water. Specifically, principles that are consistent with those used by the Commission in its *2008 Water Price Review* for the regional and rural water businesses. In particular, it proposes that:

- Prices should be set so as to have regard to the price of any substitutes and customers' willingness to pay
- Prices should cover the full cost of providing the service (with the exception of services related to specified obligations or maintaining balance of supply and demand)
- Prices must include a usage component in order to provide appropriate signals to recycled water customers to manage resources
- Any revenue shortfall arising from recycled water schemes required to meet specified obligations, e.g. mandated targets, or to maintain balance of supply and demand, will be recovered through bulk charges to the metropolitan retail water businesses.

In relation to the fourth principle, it is proposed that over the 2009 regulatory period, the anticipated revenue shortfall be recovered from sewerage prices. This is consistent with the principle of polluter pays and the fact that sewage salinity is constraining recycled water opportunities.

[15] As for water, it is also proposed that there would be an annual assessment of demands.

Chapter 2

Purpose

The Water Plan process is a legislated requirement for Melbourne Water.

It is about ensuring efficient service provision and prices which support that outcome.

This chapter outlines the purpose of the 2009 Water Plan and the relevant procedural requirements that Melbourne Water has considered and met. It also outlines the structure of the 2009 Water Plan.

2.1 Purpose and procedural requirements of the Water Plan

The Commission is responsible for the economic regulation of the Victorian water industry. This responsibility includes setting prices and service standards for regulated services provided by the State's water businesses.

The Water Industry Regulatory Order[16] sets out which services are to be regulated and the framework for economic regulation by the Commission.

Melbourne Water's Statement of Obligations, in relation to water, sewerage and recycled water services was revised on 30 October 2008 and requires the submission of a Water Plan to the Commission on 5 November 2008.[17]

The 2009 Water Plan is designed to meet this requirement and enable the Commission to determine prices for water, sewerage and recycled water services provided by Melbourne Water for the period 1 July 2009 to 30 June 2013 (the 2009 regulatory period).

It is noted that the Statement of Obligations was also revised in June 2008 to specify the process for determining water, sewerage and recycled water prices for the one year regulatory period 1 July 2008 to 30 June 2009.

[16] Water Industry Regulatory Order 2003 made under the *Water Industry Act 1994*.

[17] Section 7.2 and 7.3 of Melbourne Water's revised Statement of Obligations. Waterways services were the subject of a separate process with the 2008 Waterways Water Plan submitted to the Commission in December 2007.

The Statement of Obligations includes provisions relating to the content of the 2009 Water Plan.[18] In particular, the Water Plan must include:

- Outcomes to be delivered over the regulatory period with respect to standards and conditions of supply and meeting future demands. Outcomes must comply with any obligations specified in the Statement of Obligations and any other obligations imposed by or under legislation
- How Melbourne Water proposes to deliver those outcomes
- The proposed revenue requirement and prices or pricing principles for each of Melbourne Water's prescribed services.

Section 8 of the Statement of Obligations sets out the procedural requirements for the preparation of the 2009 Water Plan. These requirements, and Melbourne Water's response, are detailed in Table 2.1.

Table 2.1: Summary of compliance with procedural requirements

Requirement	Melbourne Water's response
Melbourne Water must consult: (a) each regulatory agency on outcomes to be included in the Water Plan that relate to a regulatory obligation (b) the Commission on standards and conditions of service and supply to be included in the Water Plan.	Melbourne Water consulted EPA Victoria in relation to environmental obligations and the Department of Human Services regarding drinking water quality requirements. In both cases Melbourne Water set out its understanding of required outcomes over the period as well as strategies and expenditures to deliver these outcomes. Service standards have also been discussed with the Commission.
In developing the Water Plan, Melbourne Water must consult the Department of Sustainability and Environment on matters that relate to the performance of Melbourne Water's functions and the obligations specified in Statement of Obligations.	Melbourne Water consulted with the Department of Sustainability and Environment in relation to obligations set out in the Statement of Obligations including those relating to long term supply augmentations and responding to drought, water conservation and recycling, sustainability initiatives, waterways services and dam safety.

The Minister for Water also wrote to Melbourne Water and noted that the State Government's response to the Victorian Competition and Efficiency Commission report on reform of the metropolitan retail water sector included a requirement to further amend the Statement of Obligations. Specifically, in relation to quantifying outcomes and pursuing savings through shared services and coordinated procurement arrangements. The 2009 Water Plan has been prepared incorporating these likely future requirements.

[18] Section 7.4 of Melbourne Water's revised Statement of Obligations.

2.2 Structure of the Water Plan

The structure of Melbourne Water's 2009 Water Plan is set out in Table 2.2.
It has been prepared consistent with the requirements of Melbourne Water's Statement of Obligations and guidance issued by the Commission. Relevant background and contextual information has also been provided to assist understanding and provide for meaningful consultation on the proposed outcomes, expenditures and prices.

Table 2.2: Structure of the 2009 Water Plan

Content	Chapter	Description
Background		
	Chapter 3 Background	An overview of Melbourne Water and the metropolitan water industry, including its structure, regulation and services provided.
	Chapter 4 Industry context	A description of the water industry's current operating environment, including the challenges associated with ongoing drought and climate uncertainty.
	Chapter 5 Outcomes over the 2005 regulatory period	An overview of Melbourne Water's performance against key performance indicators over the 2005 regulatory period. Planned and actual expenditures and demands are also discussed.
Regulatory framework		
	Chapter 6 Framework for economic regulation	A description of the recommended regulatory framework to ensure meaningful incentives for improved performance, appropriate allocation of risks and reasonable measures to manage the uncertainties associated with a longer regulatory period.
Required content[19]		
(a) outcomes to be delivered in the regulatory period with respect to meeting future demands on the Authority's (Melbourne Water's) services and complying with any obligations specified in this Statement, a regulatory obligation and those imposed by or under legislation	Chapter 7 Outcomes over the 2009 regulatory period	Sets out customer service, government and regulatory obligations and outcomes to be delivered over the 2009 regulatory period as well as strategies that have been developed to deliver these outcomes.
	Chapter 8 Demand	Provides demand forecasts for water and sewage volumes, pollution loads and recycled water volumes.
(b) the Authority's proposed delivery of those outcomes (c) the Authority's revenue requirements in the regulatory period	Chapters 9 – 13	These chapters set out future estimates of the "building blocks" for the revenue required for the efficient delivery of water, sewerage and recycled water services over the 2009 regulatory period, consistent with the Commission's approach to regulating prices.
	Chapter 9 Planning	Sets out the various planning frameworks that guide capital and operating expenditure decisions.
	Chapter 10 Capital expenditure	Provides forecasts of capital expenditure over the 2009 regulatory period and demonstrates that the proposed capital expenditure is efficient and consistent with the demand for Melbourne Water's services and regulatory obligations.

[19] Section 7.4 of Melbourne Water's Statement of Obligations.

Content	Chapter	Description
	Chapter 11 Operating expenditure	Provides forecasts of operating expenditure over the 2009 regulatory period and demonstrates that the proposed operating expenditure is efficient and consistent with the demand for Melbourne Water's services and regulatory obligations.
	Chapter 12 Financing capital investments and taxation	Provides Melbourne Water's proposed approach to the return of, and return on, capital.
	Chapter 13 Revenue requirement	Outlines the total revenue requirement.
(d) The proposed prices to be charged for each of the Authority's prescribed services.	Chapter 14 Prices	Outlines proposed prices and demonstrates consistency with Water Industry Regulatory Order principles and guidance provided by the Commission, describing how tariffs have been developed in consultation with customers.
	Chapter 15 Non-prescribed services	Details which services have been treated as non-prescribed and provides an overview of the expenditure and revenue forecasts associated with those services.
Appendices		
	Appendix 1	Summary of obligations: EPA Victoria environmental obligations Department of Human Services obligations Department of Sustainability and Environment obligations Customer service obligations
	Appendix 2	Construction cost inflation report
	Appendix 3	Major capital projects
	Appendix 4	Weighted average cost of capital report
	Appendix 5	Price schedule
	Appendix 6	Principles for bulk water and sewerage cost allocation
	Appendix 7	Basis for proposed bulk water and sewerage prices

Chapter 3

Background

Melbourne Water provides wholesale water, sewerage, waterways and recycled water services to the greater Melbourne area.

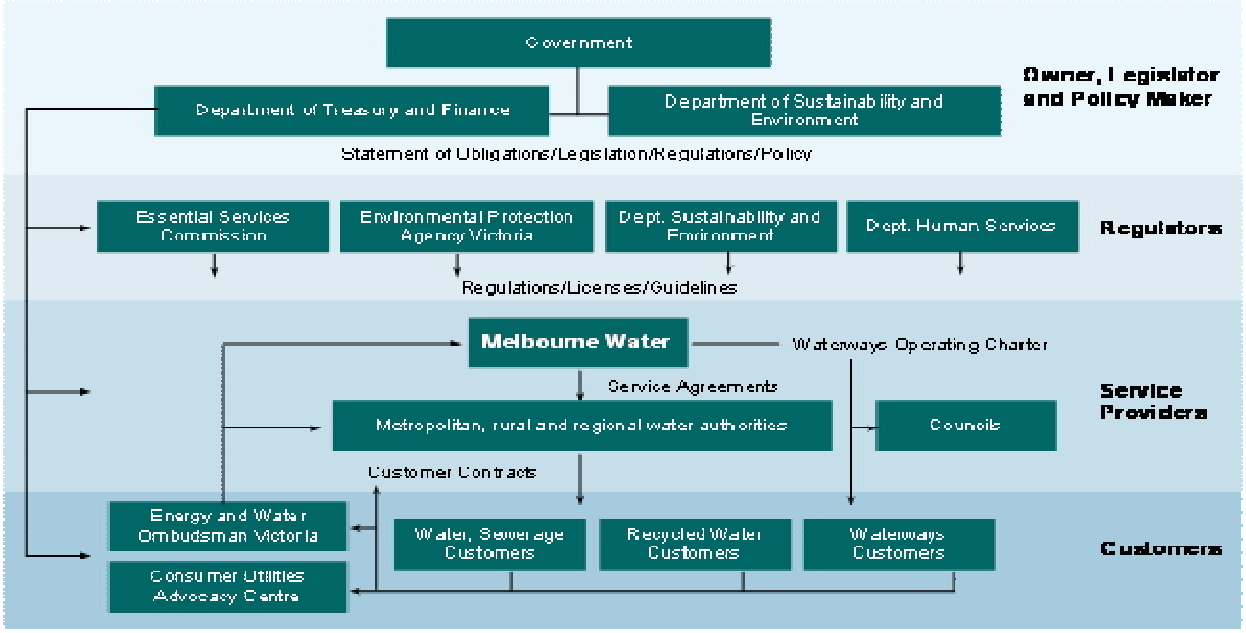
The size and nature of Melbourne Water's activities mean that it has a unique position within the Victorian water industry.

This chapter outlines the current structure of the metropolitan water industry as well as the nature and scale of activities provided by Melbourne Water. The industry's current operating environment, as well as future challenges, are discussed in Chapter 4.

3.1 Industry structure and regulation

The structure of the Melbourne metropolitan water industry is illustrated in Figure 3.1. The roles and accountabilities of the principal participants are outlined below.

Figure 3.1 – Industry structure and regulatory framework



The State Government sets the policy and legal framework, specifies water business obligations and monitors water business performance. Legislation (e.g. *Water Act 1989*), regulations (e.g. drinking water quality regulations), legal instruments (e.g. bulk water entitlements) and policy documents (e.g. the Central Region Sustainable Water Strategy) are issued by the State Government and guide business and regulatory decisions.

The Minister for Water is responsible for allocating water resources and, with the support of the Department of Sustainability and Environment, sets out specific requirements for each business through their individual Statements of Obligations.

In the metropolitan sector, the Treasurer, in consultation with the Minister for Water, monitors financial performance and represents the State Government's shareholder interests, including returns to government and borrowing requirements.

The Commission regulates prices and customer service standards for prescribed water, sewerage, waterways

[20] and recycled water services across Victoria consistent with its legislative requirements[21] and the Water Industry Regulatory Order.

EPA Victoria sets and enforces environment standards consistent with key principles set out in the *Environment Protection Act 1970*. The Department of Human Services sets and enforces water quality standards to ensure water provided by the water businesses complies with relevant State Government legislation and regulations and national and international water quality guidelines.

The Energy and Water Ombudsman Victoria provides retail customer dispute functions while the Consumer Utilities Advocacy Centre provides retail customer advocacy functions.

A distinguishing feature of the metropolitan Melbourne water industry is the separation of wholesale and retail functions. Melbourne Water provides wholesale water, sewerage and recycled water services consistent with State Government, regulatory and customer requirements. Service standards for wholesale water, sewerage and recycled water services are set out in supply agreements that are commercially negotiated between Melbourne Water and the retail water businesses.

Waterways service standards are set out in Melbourne Water's Waterways and Drainage Operating Charter, developed in consultation with its Waterways Advisory Committee representing key stakeholder interests and the Department of Sustainability and Environment.

The retail water businesses supply and levy charges for water, sewerage and recycled water services provided to the people and businesses of Melbourne, consistent with State Government, regulatory and customer requirements.

Councils manage the local drainage network (the top 60 hectares of a catchment) and work with Melbourne Water to provide flood protection and manage stormwater quality.

[20] Waterways services are not a part of this 2009 Water Plan, but are referred to for completeness. Waterways services were the subject of a separate process, with the 2008 Waterways Water Plan submitted to the Commission in December 2007.

[21] Legislative provisions relevant to the Commission's regulation of the water industry include those of the *Essential Services Commission Act 2001* and the *Water Industry Act 1994.*

3.2 Melbourne Water

Melbourne Water is a water resource manager, providing water, sewerage and recycled water services to Melbourne's retail water businesses, and waterways and regional drainage services to the greater Melbourne community. In doing so, we are committed to managing our business efficiently to achieve a vision of '*Working together to ensure a sustainable water future'*.

3.2.1 Governance

Melbourne Water is a statutory corporation, fully owned by the State Government.

An independent Board of Directors, responsible to the Minister for Water, undertakes the governance of Melbourne Water. The Board previously operated under the provisions of the *Melbourne Water Corporation Act 1992.* However, the passage of the *Water (Governance) Act* in 2007 has seen the *Melbourne Water Corporation Act 1992* repealed and the establishment of a more consistent governance framework for Victorian water authorities.

3.2.2 Service responsibilities

Melbourne Water's service responsibilities span the urban water cycle ensuring the integration of planning and operating decisions, including the provision of:

- Water to the three metropolitan retail water businesses and two non-metropolitan water authorities (Western Water and Gippsland Water).[22] In 2006/07, Melbourne Water supplied approximately 412 GL, representing approximately 60% [23] of the State's potable water
  and around 16% of total water supplied (see Figures 3.2)
- Sewerage services to the three metropolitan retail water businesses. In 2006/07, this involved transferring and treating 273 GL of sewage of which approximately 23%[24] was recycled
- Waterways services, including drainage management, waterway management and water quality protection to the greater Melbourne metropolitan area and also administering diversion licenses for the Yarra and Maribyrnong catchments
- Recycled water services to metropolitan retail water businesses, Southern Rural Water and a private sector recycled water supplier.

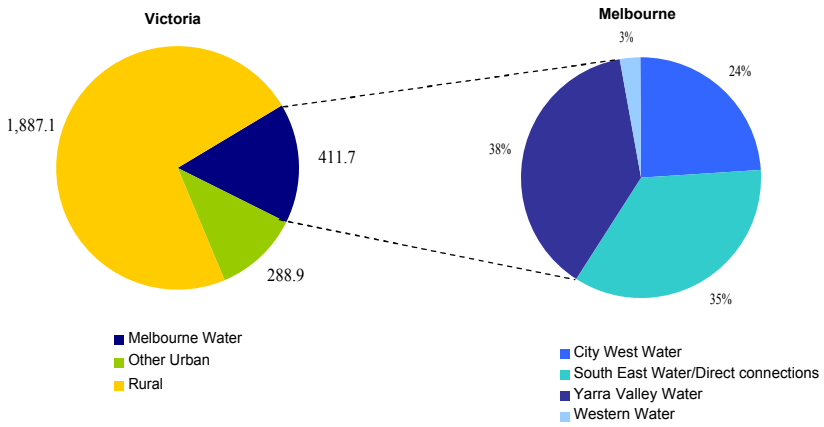
It should be noted that comparisons between Melbourne Water and other Victorian Water businesses are based on 2006/07 due to the availability of comparative data. Industry performance reports for 2007/08 will only be published in 2009.

[22] The Government's *Our Water Our Future: the Next Stage of the Government's Water Plan*, notes that supply will be extended to Geelong (Barwon Water) and towns in the Westernport (Westernport Water) and the South Gippsland region (South Gippsland Water) by late 2011.

[23] *Victorian Water Review 2006/07*.

[24] Result excludes recycled water used as environment flows.

Figure 3.2: Water supplied (GL) – 2006/07 [25]



Melbourne Water also engages in a limited number of activities related to the provision of its core services that add value to the business without impacting on the cost or quality of its core services. Significant activities in this regard include Werribee Agriculture, which undertakes agricultural operations at the Western Treatment Plant (see Chapter 15 for further details).

3.2.3 Strategic framework

Melbourne Water's strategic framework, *Sustainable Water*, reflects relevant legislation and State Government policy, and provides the context for Melbourne Water's planning and service delivery, ensuring that social, environmental and economic issues are considered.

Key elements of the strategic framework are outlined below:

Our Vision

Working together to ensure a sustainable water future.

Our sustainability principles

Melbourne Water's commitment to sustainability will be demonstrated by:

- Protecting and conserving Melbourne's water resources
- Protecting and improving the environment, including biodiversity
- Our leadership, scientific research, creativity and innovation
- Ensuring responsible risk management
- Sharing information and fostering collaborative working relationships
- Maintaining long-term financial viability
- Contributing to the health of the community
- Demonstrating corporate social responsibility
- Ensuring intergenerational equity by considering short term and long term implications in all decision making

[25] *Victorian Water Review 2006/07*. Figures do not include water supplied by Melbourne Water to Gippsland Water, which is less than 1% of total water supplied.

- Providing an environment where employees are encouraged to achieve their full potential.

Our values

- We recognise that we achieve more by working collaboratively
- We behave with integrity
- We attain excellence through creativity and innovation
- We celebrate our achievements and learn from our experiences
- We work with openness, transparency and accountability.

Our goals

Water resources

- Protect and conserve Melbourne's existing water resources
- Protect our water supply catchments from bushfire
- Develop alternative water resource, including recycled water, that meet our customers' current and future needs
- Increase water resource efficiency.

Public health

- Supply high quality and reliable drinking water
- Deliver safe sewage transfer, treatment and disposal
- Manage flood risk.

Natural environment

- Improve environmental outcomes from all aspects of our business
- Improve river health and the marine environment
- Improve biodiversity
- Preserve and promote our cultural heritage.

Financial viability

- Increase business value through innovation and efficiency
- Balance investments and levels of risk and service
- Maximise resource efficiency
- Maintain sound governance
- Ensure investment decisions are sustainable
- Deliver planned shareholder returns.

Infrastructure

- Ensure stringent regulatory obligations are met
- Provide efficient and effective capital planning processes and maintenance programs
- Develop and implement efficient capital investment and operations programs
- Minimise waste disposal and maximise resource recovery.

Our people

- Provide a safe and enjoyable work environment which brings out the best in people
- Attract and retain a diverse, motivated, skilled and experienced workforce
- Encourage our people to develop and share knowledge gained from each other and stakeholders
- Implement a framework which rewards employees' performance against the delivery of our business objectives
- Ensure sustainable work practices.

Relationships

- Identify and meet customer service expectations
- Develop enduring partnerships with retail water businesses, developers and other customers through open and transparent communication
- Build cooperation with all levels of State Government and regulators
- Further develop programs to support corporate social responsibility
- Foster the exchange of knowledge with the community
- Develop collaborative relationships with suppliers to gain support for our sustainability principles.

3.2.4 Scale of activities

Table 3.1 illustrates the relative scale of the services provided by Melbourne Water.

Table 3.1: Services provided – 2006/07

	Melbourne Water	Victorian Urban[a]	Australian Major Urban[b]
Water			
Total potable water supplied (GL)	412	591	1,088
Sewerage			
Total sewage treated (GL)	273	409	854
Waterways and drainage			
Population receiving services (000s)	3,762	N/A	N/A
Recycled water			
Water recycled (GL)	61	97	63
Percentage of water recycled	22.7%	23.7%	

Source: *Melbourne Water and National Performance Report 2006/07* urban water utilities. The report for 2007/08 will be published in 2009.

Notes a Victoria Urban includes all metropolitan and regional urban authorities
b Australian Major Urban is the total for Sydney, Newcastle, Brisbane, Perth and Adelaide
Sewerage treated estimated for some Victorian retail water businesses
'Water recycled' results for Melbourne Water excludes recycled water supplied as environmental flows

Table 3.2 sets out Melbourne Water's revenues for 2006/07 and 2007/08.

Table 3.2: Melbourne Water revenue

Services	Revenue 20006/07 ($M)	Revenue 2007/08 ($M)
Water	187.3	182.9
Sewerage	193.7	195.8
Waterways and drainage	149.6	153.7
Drainage developer	49.5	54.8
River diversion licences	0.5	0.6
Recycled water	2.0	2.2
Other services	45.6	35.7
Total	**628.2**	**625.7**

By the end of the 2005 regulatory period, Melbourne Water managed water, sewerage, waterways and drainage, recycled water and corporate assets worth more than $5.0 billion.[26] The opening 2009 regulatory asset value, including waterways, is $6.0 billion, which reflects expenditure during 2008/09.[27]

Melbourne Water supplies water from nine major reservoirs, with a total capacity of 1,773 GL; 65 service reservoirs; 1,018 kilometres of water distribution mains; more than 200 kilometres of aqueducts and tunnels; 78 water treatment plants and operates 48 drainage, sewage and water pumping stations.

Melbourne Water's sewerage system comprises 399 kilometres of sewers and includes Melbourne's two main sewage treatment plants – the Western Treatment Plant and the Eastern Treatment Plant. It operates three major sewage pumping stations located at Kew, Hoppers Crossing and Brooklyn, as well as several minor pumping stations.

Its waterways boundary was extended in November 2005, by more than 500,000 hectares, to approximately 1,300,000 hectares. With the extended boundary, Melbourne Water now has responsibility for around 8,400 kilometres of waterways and manages 258 water quality treatment systems, comprising 123 wetland systems; 75 sediment traps; 44 litter traps and 16 combined sediment and litter traps.

Melbourne Water's assets are characterised by long lives, ranging from ten years (pump station instrumentation) to up to 200 years (dams).

Melbourne Water also manages a large number of natural assets including rivers, creeks and 156,658 hectares of protected water supply catchments.

[26] This is based on Melbourne Water's Regulatory Asset Value at the end of the 2005 regulatory period. The Regulatory Asset Value for water, sewerage, recycled water and corporate assets is $4.1billion.

[27] The Regulatory Asset Value as at the start of the 2009 regulatory period for water, sewerage, recycled water and corporate assets is $5.1 billion. This includes the working assumptions provided by the Minister for Water for preparing the 2009 Water Plan (see Chapter 6 for further detail about these working assumptions).

3.2.5 Service provision – private sector involvement

While Melbourne Water is owned by the State Government, it makes extensive use of the private sector to access specialist expertise and improve service efficiency. For example, in 2007/08, some 78% of direct operating expenditure and 99% of capital expenditure was outsourced to the private sector.

3.2.6 Service provision – supply systems

Water

Melbourne Water's water supply system comprises assets which harvest, store, treat and transfer water to the retail water businesses for delivery to end users. The physical extent of the system and key assets are shown in Figure 3.3.

The principal features of Melbourne Water's existing water supply system are:

- Approximately 80% of water supply is sourced from surface water resources harvested from the Yarra and Thomson River catchments with the remainder being extracted directly from the Yarra River at Yering Gorge or diverted from the creeks in the Goulburn River Basin through the Yan Yean Reservoir
- Water sourced from protected catchments only requires limited treatment (e.g. disinfection and pH correction) to meet physical and biological water quality requirements. Wherever possible, this water is used in preference to water either directly harvested from the Yarra River or sourced from Yan Yean Reservoir, both of which require full filtration
- Water is transferred from east to west and southwest, largely under gravity, through seasonal transfer and regional distribution systems.

In June 2007, in response to continuing drought and the challenge of climate change, the State Government released *Our Water Our Future: the Next Stage of the Government's Water Plan*. It will increase water security by diversifying and boosting water supplies in Melbourne, networking the State's water resources in the Victorian Water Grid and enabling a rapid and flexible response to changing future water needs. Melbourne Water will play a significant role in implementing the key projects identified in the State Government's Water Plan, including construction of the Sugarloaf Pipeline.

Sewerage

Melbourne Water's sewerage system comprises assets that transfer, treat and dispose of sewage and trade waste collected from the metropolitan retail water businesses. The physical extent of the sewerage system and key assets are illustrated in Figure 3.4.

The key features of Melbourne Water's sewerage system are:

- The network of main sewers transfers sewage from the retail interface points by gravity and pumping to the two treatment plants: at Bangholme (Eastern Treatment Plant) and at Werribee (Western Treatment Plant). Around 10% of flows are divertible between the two treatment plants and this capability is used to optimise system performance and costs

- The two treatment plants use different technologies. The Western Treatment Plant uses a lagoon based treatment process enhanced with the inclusion of activated sludge plants. The Eastern Treatment Plant uses a chemically-driven activated sludge process
- The Western Treatment Plant processes about half of Melbourne's sewage, including a large proportion of the city's industrial waste, while the Eastern Treatment Plant processes about 40% . Local treatment plants, operated by the retail water businesses, process the remainder
- Treated effluent that is not recycled from the Western Treatment Plant is discharged to Port Phillip Bay
- Treated effluent that is not recycled from the Eastern Treatment Plant is transferred for release into Bass Strait at Boags Rocks. In 2007/08, approximately 66%[28] of the effluent was recycled at the Western Treatment Plant and 34% of effluent at Eastern Treatment Plant.[29]

Recycled water

Melbourne Water currently transfers recycled water off-site from its Eastern and Western Treatment Plants to the retail water businesses for delivery to end-users. Recycled water is also distributed for on-site use at the Western Treatment Plant and the Eastern Treatment Plant.

Class C water is currently available from the Eastern Treatment Plant and Class A water is available from the Western Treatment Plant.[30] The physical extent of the recycled water system and key assets are illustrated in Figure 3.5 below.

[28] This excludes recycled water supplied as environmental flows at the Western Treatment Plant.

[29] *Our Water Our Futur: the Next Stage of the Government's Water Plan* notes the Government's commitment to upgrading the Eastern Treatment Plant to tertiary standard to increase water recycling opportunities.

[30] *Our Water Our Future: the Next Stage of the Government's Water Plan* notes the Government's commitment to upgrading the Eastern Treatment Plant to tertiary standard to achieve Class A recycled water standards and to facilitate increased water recycling opportunities.

Figure 3.3: Water system

Figure 3.4: Sewerage system

Figure 3.5: Recycled water system

Chapter 4

Industry context

Melbourne Water has experienced a number of unanticipated changes in its operating environment since the Commission set prices in mid 2005:

- Climate variability, the worsening drought and the introduction of tighter water restrictions have reduced demand and revenues, increased operating costs and brought forward capital expenditure
- New legislative and regulatory obligations have seen material increases in expenditure
- There have been higher than planned increases in some input costs.

These considerations have had a significant impact on Melbourne Water's 2009 regulatory period expenditure forecasts.

This chapter discusses factors that have impacted on business performance over the 2005 regulatory period and that are important for the 2009 regulatory period. Further information on the implications of these issues on Melbourne Water's financial and non-financial performance over the 2005 regulatory period is provided in Chapter 5. Later chapters discuss their implications for the regulatory framework (Chapter 6), future business requirements (Chapter 7) and the associated capital and operating expenditures (Chapters 10 and 11).

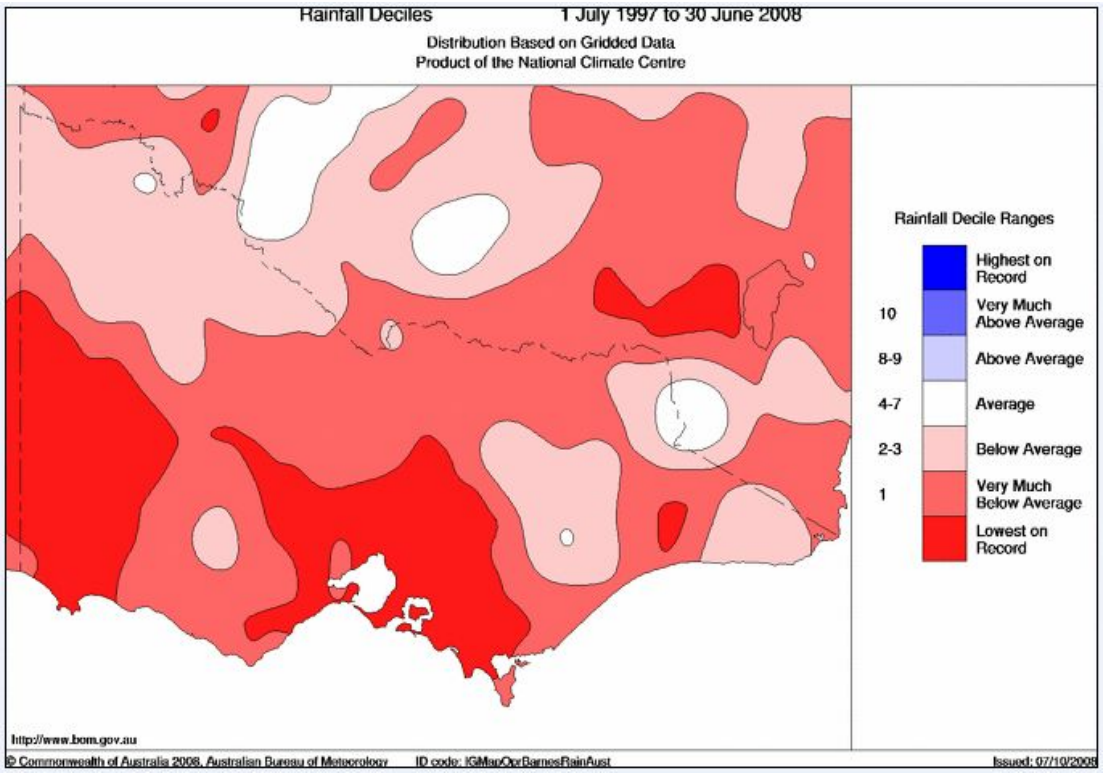
4.1 Climatic conditions

4.1.1 Water supply

Recent experience

Until the mid 1990s, Melbourne had relatively reliable rainfall. Since then, there has been some of the lowest rainfall on record across a large part of Victoria, including Melbourne Water's catchments (Figure 4.1). Rainfall recorded at Melbourne Water's reservoir sites for the 2007/08 financial year was 13% to 26% lower than the 30-year average (1978 to 2007).

Figure 4. 1: Rainfall deciles for Victoria – 1997 to 2008



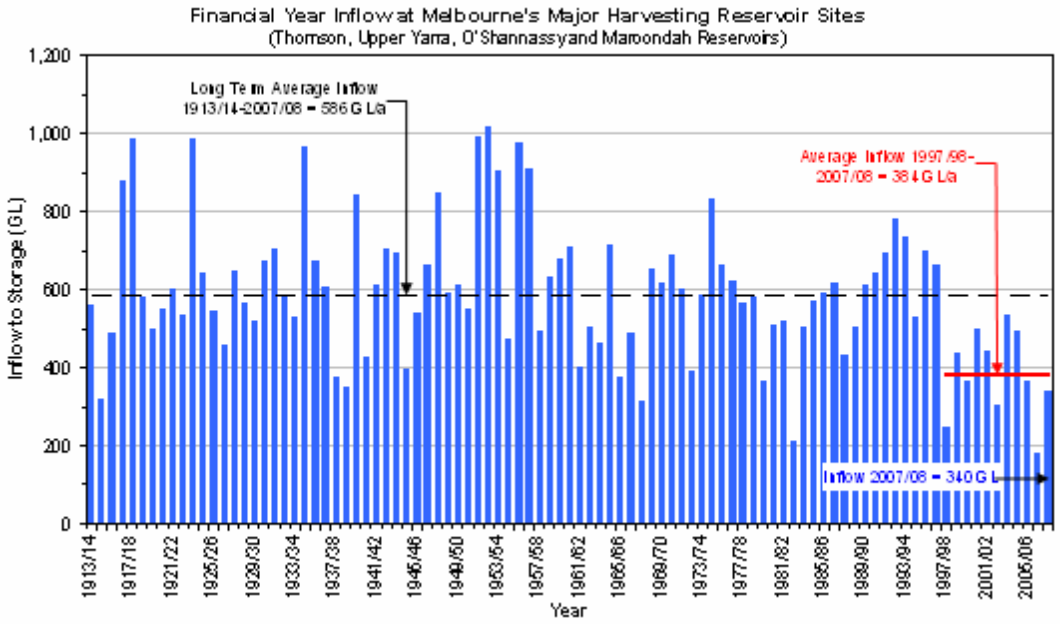
Below average rainfall, higher temperatures and reduced soil moisture have resulted in less surface water run-off into Melbourne Water's storages. For example, about 1,200 mm of rainfall was recorded at Thomson dam in 1995 and resulted in 279 GL of inflows. In 2007, a similar rainfall total resulted in only 179 GL of run-off. This reduction in run-off was due mainly to drier catchment conditions.

Average inflows over the last 11 years have been 35% lower than the long term (1913/14 to 2007/08) average inflow (refer Figure 4.2). Inflows to Melbourne's four major harvesting storages for 2007/08 were 340 GL, 11% less than the average over the last 11 years (1997/98 to 2007/08) and 42% less than the long term average.

These below average inflows have resulted in storage levels falling to a record low. By the end of June 2008, Melbourne Water's reservoirs were less than 30% full and Melbourne's largest water storage, the Thomson Reservoir, was approximately 18% full. Since the start of the 2008 winter/spring filling season, inflows into Melbourne's four

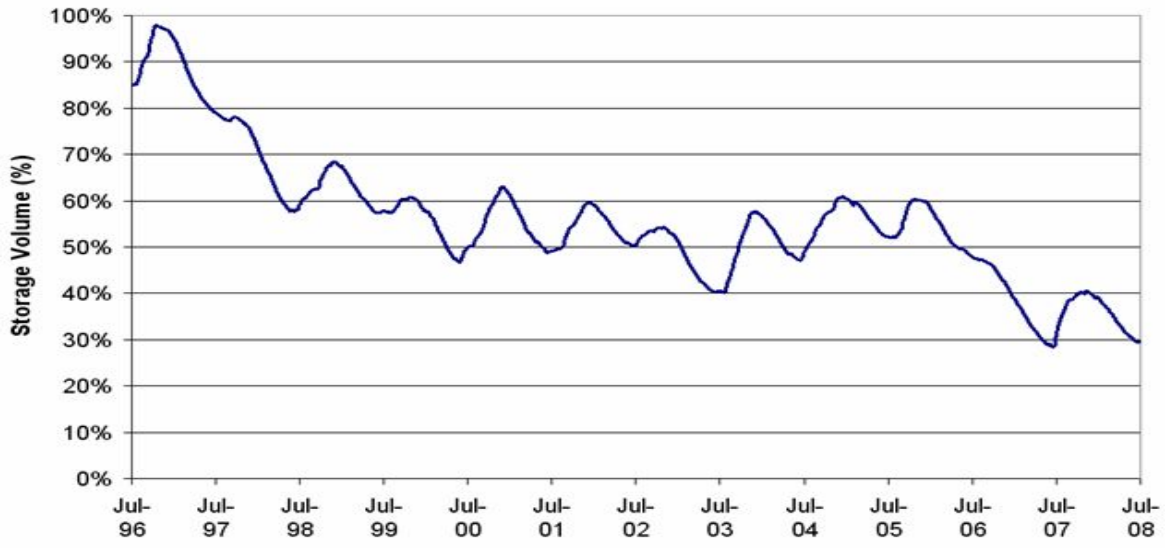
major harvesting reservoirs have been below the 1997-2006 ten-year average, resulting in only minor storage recovery. At the end of October 2008, Melbourne's water reservoirs were at 33.8% of capacity, around 100 GL lower than at the same time last year.

Figure 4.2: Melbourne Water inflow to storages – 1913/14 to 2007/08



The community has responded well to these conditions, changing water use behaviour significantly and reducing per capita consumption by almost 35% on 1990s consumption levels. However, this behavioural change, along with increased water restrictions since September 2006, and a range of contingency measures implemented by Melbourne Water and the retail water businesses, has not fully offset the significant reduction of inflows and Melbourne Water's storage levels continue to fall (Figure 4.3). Stage 3a water restrictions are currently in place and the State Government has confirmed that they will remain until at least 30 November 2008.

Figure 4.3: Melbourne Water storage levels – 1996/97 to 2007/08



In addition to the impact of recent climatic conditions on the broader community, Melbourne Water's financial and non-financial performance has also been affected. The continuation of drier conditions during 2007/08 highlighted the need to continue efforts to conserve water supplies and find new water resources.

The ongoing drought has had a negative impact on Melbourne Water's revenue with lower than forecast water demands and sewage volumes resulting in the combined water and sewerage revenue for 2005 regulatory period being approximately 8.5% lower than allowed for in the Commission's 2005 Price Determination. Additional expenditures were also required to maximise the yield of the water supply system, such as installation of additional pumps at Yering Gorge Pump Station to enable harvesting of smaller volumes, improved monitoring and control of Thomson Reservoir river releases, and increased pipe repairs to reduce leaks and the reintroduction of Swingler Weir. Recent warmer and drier weather patterns have also necessitated additional expenditure on managing the increased risk of bushfire in Melbourne's water supply catchments.[31]

See Chapter 5 for more information on performance over the current period.

Implications for the future

Climate change has the potential to impact on all of Melbourne Water's services and the uncertain nature of such change increases the challenges associated with forecasting future requirements and expenditures.

Melbourne Water has previously been able to rely on historical records as a basis for planning for the future. Recent experience and an increasing body of scientific information[32] suggest that Melbourne may have experienced a step change in the frequency, magnitude, location and duration of our weather events. While there is still some uncertainty as to the exact size of this change, it is clear that there is a need for:

- Ongoing research on climate change/variability and its implications for water businesses
- Effective planning and system operation that optimises the use of available water supplies and includes appropriate provision for contingency measures
- Major investment to restore supply security, diversify supply sources, reduce exposure to climate uncertainty and decrease reliance on water restrictions
- A regulatory framework that not only creates incentives for improved performance but ensures a reasonable allocation of risks in an uncertain operating environment.

In relation to resource planning, the *Central Region Sustainable Water Strategy* (CRSWS), released in October 2006, set the agenda for future water resource management, taking into account expected climate change impacts and water reserves at that time as well as the potential impacts of ongoing lower streamflow conditions. The CRSWS states that the consequences of managing Melbourne's water supplies assuming a return to long term average conditions that does not eventuate are unacceptable and adopted the assumption that low flows would continue.

[31] A major bushfire in Melbourne's water supply catchments would have a significant impact on water quality and availability in the short term and longer-term system yield.

[32] For example, The Intergovernmental Panel on Climate Change's Fourth Assessment Report 2007 concludes that the evidence supporting the warming of the earth's climate system is unequivocal. The Melbourne Climate Change Study was completed by the Commonwealth Scientific and Industrial Research Organisation (CSIRO) in March 2005 and identified the potential for higher average and summer temperatures, reduced rainfall and more extreme weather events.

Chapter 4
Industry context

In June 2007, in response to continuing drought and further reductions in water reserves, the State Government released *Our Water Our Future: the Next Stage of the Government's Water Plan* (the State Government's Water Plan). It considered the implications of a repeat of average storage inflows over the last 100, 10 and 3 years and concluded that, while a repeat of the last three years (2004 to 2006) was a relatively unlikely event, '*Our planning must enable us to deal with very low inflows. When it comes to water, being risk averse and prudent makes good sense'*.[33]

The State Government's Water Plan identifies a range of system augmentations that will increase water security by diversifying and boosting water supplies, networking the State's water resources in a Victorian Water Grid and enabling a rapid and flexible response to changing future water needs. Melbourne Water will make a major contribution to implementing the State Government's Water Plan through:

- Payment obligations in relation to the Victorian Desalination Project[34] which will provide up to an additional 150 GL per year by the end of 2011. This project is being delivered by the Department of Sustainability and Environment as a PPP and is presently in the bidding phase
- Constructing the Sugarloaf Pipeline linking the Melbourne supply system to the Goulburn River and contributing to the State Government's Food Bowl Modernisation project to secure up to 75 GL per year for Melbourne by mid 2010
- Constructing a water treatment plant at the Tarago Reservoir by mid 2009 which will add around 15 GL to annual supply
- Upgrading the Eastern Treatment Plant to tertiary standard by 2012 to facilitate improved environmental outcomes and increase future water recycling opportunities.

As with similar augmentations planned or underway in other Australian states (see Box 4.1), the expenditures associated with augmentation projects will be very large.[35] About $816 million in capital expenditure will be invested by Melbourne Water in constructing the Sugarloaf Pipeline and upgrading the Eastern Treatment Plant to tertiary standard over the 2009 regulatory period.[36]

[33] *Our Water, Our Future: the Next Stage of the Government's Water Plan*, Victorian Government, June 2007, p 22.

[34] The 2009 Water Plan assumes service payments for the Victorian Desalination Project under the PPP arrangements will be operating expenditure for Melbourne Water. The Department of Sustainability and Environment tender process for the PPP is expected to be finalised by late 2009.

[35] See Chapters 10 and 11 for more information.

[36] The capital expenditure does not include the water treatment plant at the Tarago reservoir, which will be delivered before the 2009 regulatory period, or the Victorian Desalination Project which it is assumed will be delivered as a PPP and therefore the service payments under the PPP arrangements will be operating expenditure for Melbourne Water.

Box 4.1: Augmentations occurring in other Australian states[37]

Many cities in Australia are facing some form of restrictions and a number of major new supply augmentations are being introduced. In 2007/08, major projects in Australia's capital cities accounted for more than $2 billion of expenditure. Major augmentations either underway, or proposed, include:

- South East Queensland – construction of a desalination plant with capacity of 45 GL per annum (scheduled for completion by early 2009), the Western Corridor Recycled Water Scheme which will deliver approximately 85 GL per annum (scheduled for completion in November 2008) and the South East Queensland Water Corridor pipeline (scheduled for completion by the end of 2008)
- Sydney – construction of a desalination plant with initial capacity of 90 GL per annum (scheduled for completion in 2009/10) and the Rosehill/Camelia Project to deliver 4.3 GL of recycled water to industrial and commercial customers (operational by 2011)
- Western Australia – construction of a desalination plant with capacity to produce around 50 GL per annum, with potential to produce 100 GL per annum (operational in 2011)
- Adelaide – A pilot plant has been constructed and expressions of interest have been called for a desalination plant at Port Stanvac with a capacity of 50 GL per annum (to be completed by 2011).

In terms of operating costs, Melbourne Water has previously enjoyed advantages relative to other major urban water supply businesses in Australia. This is because of its extensive use of protected water supply catchments (significantly reducing treatment costs) and widespread use of gravity in transporting water. Over the 2009 regulatory period, a significant increase in operating expenditure will be incurred to fund and operate the four new augmentations, detailed above. This includes payment obligations for the Victorian Desalination Project, under the assumed PPP arrangements.[38]

4.1.2 Other potential impacts of climate change

The apparent shift in climate conditions since the mid 1990s has impacted on Melbourne Water's sewerage, waterways and recycled water services over the 2005 regulatory period. Climate change could have significant implications for the management and operation of these services in the long term.

The current drought has impacted on sewage flows through lower inflow and infiltration, while restrictions and demand management have contributed to lower than planned water use, resulting in reduced revenue and increasing sewage concentrations.

In the future, sewerage system performance may be impacted by a change in the frequency, intensity and location of storm events. More intense or protracted storm events could create issues related to the hydraulic capacity of the sewerage system. Melbourne has experienced a number of major storms in recent times. Events in December 2003, January 2004 and February 2006 led to localised flooding, disruption and property damage (Figure 4.4).

[37] *WSAA Report Card 2007/08, Performance of the Australian Urban Water Industry and projections for the future*, p 5-8.

[38] Final contractual arrangements for the PPP are not expected to be known until late 2009.

Figure 4.4: Localised Flooding in 2005

Dandenong Creek, Dandenong, 2005

Kororoit Creek, Deer Park, 2005

Over the 2005 regulatory period, Melbourne Water has made emergency supplies of recycled water available from the Western Treatment Plant, including supplies to City West Water customers such as local councils, for the watering of parks and ovals. In the future, consistent with State Government policy, Melbourne Water will continue to strive to optimise recycled water use (particularly where this replaces the use of potable water). However, the potential for more extreme weather and higher temperatures is likely to increase the volatility of demand, making sizing future recycled water infrastructure challenging and increasing the risk of under-utilised assets or insufficient capacity to meet customer needs.

4.1.3 Implications for Melbourne Water

Melbourne Water continues to review and revise its forecasting methodologies to ensure planning and risk management initiatives are based on the best available information. Notwithstanding these efforts, there is significant uncertainty as to the length and severity of the current drought, the potential for greater climate variability and the potential impacts of climate change on Melbourne Water. This clearly increases the challenges associated with forecasting the level and timing of expenditure requirements for the 2009 regulatory period and highlights the need for the regulatory framework to take into account the challenges of a changing and uncertain environment while still creating incentives for improved performance.

4.2 Industry reform and policy development

There has been significant industry reform and policy development undertaken in recent years and this is anticipated to continue over the 2009 regulatory period.

Since the Commission set prices on 1 July 2005, the State Government has continued the process of industry reform including:

- Revision of the Statement of Obligations of each Victorian water business to support a range of initiatives identified in the State Government's White Paper, *Our Water Our Future*, including an explicit requirement to consider options for improving sustainability
- Release of the CRSWS and the State Government's Water Plan
- Finalisation and transfer to the metropolitan retail water businesses of Bulk Water Entitlements for the Thomson and Yarra Rivers and Silver and Wallaby Creeks.

The new obligations arising from these decisions have increased Melbourne Water's expenditures over the 2005 regulatory period (see Chapter 5). The cost implications for future years are outlined in Chapters 10 and 11.

Increasing expenditures from new and existing obligations mean that water prices will need to rise. The metropolitan retail water businesses proposed significant average annual real price increases over the regulatory period from 2008/09 to 2012/13. The price increases, driven largely by the $4.9 billion investment announced in the State Government's Water Plan, exceeded the Government's pricing expectation that the average Melbourne water bill will no more than double in real terms over the next five years. In this context, the Government directed the Victorian Competition and Efficiency Commission, in mid 2007, to inquire into, and report on, Melbourne's current retail structure.

The Victorian Competition and Efficiency Commission recommended that the current industry structure be maintained and that a range of changes to governance and regulatory arrangements be made to further enhance the efficiency and management of the water sector. The State Government was supportive of the vast majority of the Victorian Competition and Efficiency Commission's recommendations, many of which are likely to have implications for Melbourne Water over the 2009 regulatory period:

- To achieve the State Government's pricing objectives and greater pricing parity in the future, the Minister for Water has provided written advice relating to the working assumptions Melbourne Water should use in preparing its 2009 Water Plan (see Chapter 6)
- The State Government will amend the Statements of Obligations to require the metropolitan water sector (including Melbourne Water) to examine opportunities for shared services and co-ordinated procurement of common inputs, and to implement such arrangements where it is assessed they will yield material net savings in business costs. The State Government expects these arrangements to be incorporated into the businesses' Water and Corporate plans

- The State Government has proposed that quantifiable outcomes should be included in the metropolitan water businesses' 2009 Water Plans. The metropolitan water businesses' Statements of Obligations will be changed to specify these quantifiable outcomes and the businesses' will be required to report to the Commission on their performance in achieving the outcomes[39]
- For projects involving capital expenditure of greater than $5.0 million, Melbourne Water is required to submit a business case for approval to the Department of Sustainability and Environment and the Department of Treasury and Finance. The Department of Treasury and Finance is currently reviewing this threshold with a view to raising it for State Government Business Enterprises commensurate with the size of the business. Based on recent advice from the State Government, it is likely Melbourne Water's threshold for project approvals will be increased to $50 million
- The State Government will ask the Commission to undertake an inquiry into the development of a state based access regime for water and sewerage services. The aim is to provide a framework for third parties seeking involvement in the water sector
- The Department of Sustainability and Environment, in consultation with relevant stakeholders, will develop a report to State Government that clarifies the rights to alternative water sources; wastewater, recycled water and stormwater. The aim is to improve stakeholder understanding of how these sources fit within the existing water resource management framework and identify where the rights framework could be improved
- The State Government will require Melbourne's retail water businesses and Melbourne Water to work together with relevant stakeholders to develop consistent guidelines to apply to potential sewer mining projects. These guidelines will be developed within the State Government's policy and rights framework regarding sewerage, in association with the development of a third party access regime.

Melbourne Water has undertaken significant consultation with State Government, regulatory bodies and customers in its consideration of future requirements and likely areas of reform. Where future requirements are clear, they have been included. It is possible, however, that there will be other reforms within the 2009 regulatory period that are not clear at this time. Melbourne Water has not attempted to predict such reforms and, therefore, to the extent that unanticipated requirements arise, they have the potential to impact on Melbourne Water's financial and non-financial performance. Regulatory mechanisms for managing this issue are discussed in Chapter 6.

[39] The proposed quantifiable outcomes relevant to Melbourne Water are: greenhouse gas reductions/renewable energy, recycled water, biosolids reuse, knowledge and learning and savings from implementation of shared services and bulk procurement

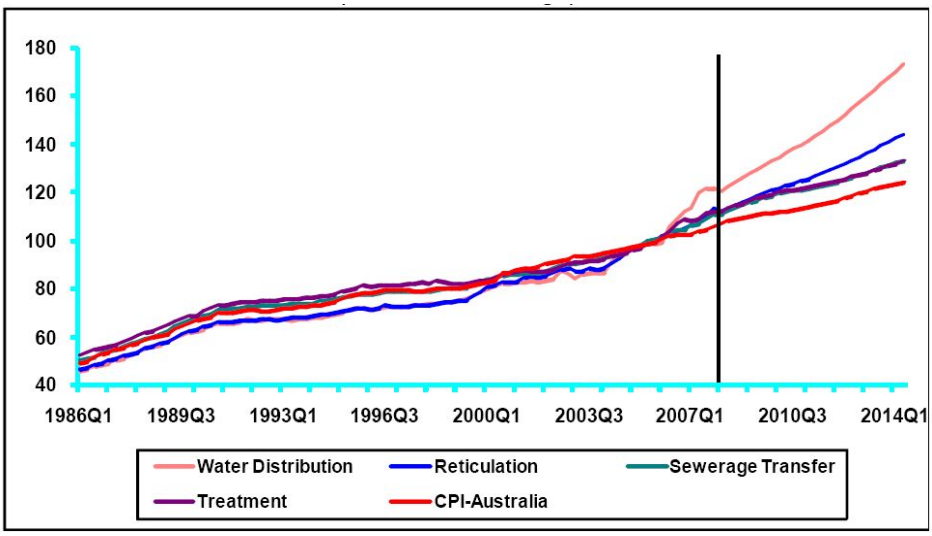
4.3 Increasing input costs

Over recent years, infrastructure providers in Australia, including water, electricity, gas and transport business, have experienced significant input cost pressures. Melbourne Water is no exception to this and has experienced a higher than anticipated increase in a number of key input costs, relative to those included in the Commission's 2005 Price Determination which, for the most part, reflected an assumption that input costs would increase in line with the Consumer Price Index (CPI).

Efficiency gains, market movements and project deferrals provide an avenue for offsetting cost increases. For example, the insurance market has eased since the Commission's 2005 Price Determination. Similarly, reprioritisation and additional information has seen some capital project deferrals. However, overall, there is limited discretionary expenditure in Melbourne Water's capital and operating budgets that can be deferred without putting customer service or regulatory compliance at risk. Further, the current drought, new obligations and the need to fast track some major projects creates tension between the need to ensure service continuity, and meet stakeholder project delivery expectations, while minimising costs.

In light of experiences over the 2005 regulatory period, Melbourne Water has attempted to ensure that its expenditure forecasts reflect a realistic expectation in regard to material movements of key input markets. This includes the development of risk-adjusted cost estimates for high value/high risk projects (see Chapter 10). Further, Melbourne Water and the metropolitan retail water businesses commissioned Econtech to undertake an independent study to forecast construction price indexes that are relevant to core aspects of their construction projects (see Appendix 2). The results of this study are illustrated in Figure 4.5 and show that the construction costs associated with water and sewerage treatment and transfer have been increasing in recent years, and are expected to continue to increase, by more than the CPI over the 2009 regulatory period. This is largely a result of increased input costs such as the prices for steel, oil (from which many input materials such as PVC are made), concrete, electrical materials and project management and design.

Figure 4.5: Capital project price indexes and CPI



Source: CWW, SEW, YVW and MW data and Econtech estimates

Expenditure estimates that better reflect material input market movements over the regulatory period will ensure that Melbourne Water's prices move with its input costs, providing improved signals for water use and investment. However, in an environment of significant price increases, this must be balanced against resultant customer impacts. This is discussed further in Chapter 10.

Chapter 5

Outcomes over the 2005 regulatory period

Melbourne Water has performed well over the 2005 regulatory period, despite facing an extremely challenging environment.

Melbourne Water has achieved a high level of compliance with targets set as part of the Commission's 2005 Price Determination.

In meeting these targets actual capital and operating expenditure was higher than forecast in the 2005 Price Determination due to emerging and unforeseen industry-wide challenges, including:

- The ongoing drought
- Changing industry policy and new obligations
- Positioning Melbourne Water to deliver a larger capital program, including water augmentation projects, over the 2009 regulatory period as driven by its new obligations
- Increased costs for existing projects and business as usual activities.

This chapter discusses Melbourne Water's performance and progress in delivering service standards and other outcomes set as part of the Commission's 2005 Price Determination. Actual capital and operating expenditures associated with delivery of these outcomes, and the reasons for variances from benchmarks provided in the Price Determination, are also examined, along with actual demand outcomes and progress in delivering key capital projects. The Chapter also discusses the impact of changes in legislative and regulatory obligations over the 2005 regulatory period and lessons that can be applied to the 2009 regulatory period.

The chapter highlights that Melbourne Water has performed well against the service standards and outcomes set as part of the Commission's 2005 Price Determination. These standards were based on the best available information at that time and significant and unexpected changes in circumstances have presented a challenging environment in which to meet these benchmarks. As outlined in the previous chapter, the operating environment for the water industry has shifted significantly since the Commission made its 2005 Price Determination. This includes:

- Ongoing drought conditions, with the 2006 calendar year inflows to Melbourne Water's reservoirs being the lowest on record and the introduction of Stage 3a restrictions
- Reduced demands reflecting ongoing water restrictions and demand management activities by the retail water businesses

- Policy development such as the release of *Our Water, Our Future: the Next Stage of the Government's Water Plan* (the State Government's Water Plan), and the *Central Region Sustainable Water Strategy* (CRSWS), requiring significant investment for new water supply augmentations
- Changes in regulatory and legislative requirements e.g. introduction of the *Water (Resource Management) Act 2005*
- An environment of increasing costs for particular inputs, including skilled resources and steel.

Despite these challenges, Melbourne Water has continued to provide high quality services that meet its service standards and health and environmental requirements. Capital and operating costs also continue to be efficient, reflecting new information about asset condition and the operating environment, as well as the impact of changing market conditions.

5.1 Service standards and other outcomes

The Commission's 2005 Price Determination detailed the approved service standards to be delivered over the 2005 regulatory period. This section sets out relevant key performance indicators and actual results achieved in the 2005 regulatory period.

Melbourne Water has achieved a high level of compliance against the targets set as part of the Commission's 2005 Price Determination. Some of the targets that were met or surpassed include those relating to water quality (E.coli and disinfection by-products), EPA Victoria licence requirements, odour complaints, recycled water and reducing greenhouse gas emissions.

The most significant performance issue for Melbourne Water over the 2005 regulatory period has been in relation to the biosolids reuse targets. No progress was made towards achieving the key performance indicators for biosolids reuse at either the Eastern or Western Treatment Plants. The reasons for this are detailed in section 5.1.2. Chapter 7 also notes the actions that will be undertaken in order to make progress towards achieving biosolids reuse targets in the future.

Over the 2005 regulatory period, there were some minor performance issues for targets relating to water quality (turbidity and aluminium), leakage, sewage spills and the number of complaints to the Energy and Water Ombudsman of Victoria. External factors contributed to actual performance for many of these indicators (e.g. the target for turbidity was not met in 2007/08 following a 1-in-150 year storm event and continued drought). Section 5.1.1, 5.1.2 and 5.1.4 provide further details on the performance of these targets and remedial actions undertaken by Melbourne Water.

Many of the obligations and outcomes detailed below are also discussed in Chapter 7 setting out the obligations and proposed outcomes for the 2009 regulatory period. In most cases, these are reflected as business as usual obligations.

Chapter 7 also sets out instances where there are new obligations and where these obligations and outcomes are proposed to change from the 2005 regulatory period.

5.1.1 Water

Table 5.1 sets out the key performance indicators and actual results achieved over the 2005 regulatory period for water services.

Table 5.1 – Key performance indicators for water

Key Performance Indicator	2005/06		2006/07		2007/08	
	2005 WP target	Actual	2005 WP target	Actual	2005 WP target	Actual
Aggregated water pressure compliance with bulk service arrangements at interface points	99.60%	100%	99.60%	99.9%	99.60%	100%
Aggregated water quality compliance with bulk service arrangements at interface points:						
– microbiological standards (*E.coli*)	99.99%	100%	99.99%	100%	99.99%	100%
– disinfection by-products	100%	100%	100%	100%	100%	100%
– aesthetic standards for turbidity	86.78%	98.5%	86.78%	91.7%	86.78%	79.4%
– aesthetic standards for aluminium	99.88%	98.8%	99.88%	99.2%	99.88%	99.7%
Level of leakage (% of water supplied)	0.94%	0.90%	0.76%	1%	0.76%	0.98%

Water pressure

Over the 2005 regulatory period, Melbourne Water complied with requirements for water pressure as specified in the Bulk Water Supply Agreements with the retail water businesses.

Water quality

Melbourne Water uses a series of risk management systems to provide multiple barriers to contamination and to ensure its supply of drinking water is reliable and safe to drink. This is consistent with the Hazard Analysis and Critical Control Point system to identify, evaluate and control hazards.

The water quality targets for E. coli and disinfection were met over the 2005 regulatory period.

Whilst the target for turbidity was met in 2005/06 and 2006/07, it was not met in 2007/08. This was due to increased turbidity arising from a storm event in the Upper Yarra Reservoir and the impact of continued drought conditions.

A 1-in-150 year storm event in July 2007 increased turbidity in the Upper Yarra Reservoir as a result of a sudden inflow of highly turbid water from the Swingler Weir and Yarra River. Fine colloidal clay particles remained in suspension in the water before slowly settling in the Upper Yarra Reservoir which supplies townships within the Yarra Valley. Melbourne Water monitored the Upper Yarra reservoir weekly following the storm event and implemented measures to reduce turbidity.

Continued drought and weather conditions have also contributed to increased turbidity due to:

- Water being supplied from low storage levels. For a large part of the 2005 regulatory period, Melbourne's storage levels were 30% to 40% full. At these reduced levels, there is less dilution of sediment washed into the reservoir from the exposed dry banks due to wind action and rainfall events. This makes it difficult for the sediment to settle effectively which increases the level of turbidity in the storage
- Supply of unfiltered water into zones previously supplied from a filtered source.

Actual performance did not meet the aesthetic water quality target for aluminium over the 2005 regulatory period. The target was set conservatively below the Australian Drinking Water Guidelines to help ensure potable water supplied to the end customers is within the limit set by the Guidelines. As the target is an aesthetic water quality standard, public health is not compromised by not meeting the target. Melbourne Water is not aware of any discernable customer impacts and actual performance was within limits set out in the Bulk Water Supply Agreements with the retail water businesses.

Aluminium can be present in filtered water supplies through the use of aluminium salts as coagulants in water treatment. Unfiltered water supplies require only minor water treatment and aluminium naturally occurs through leaching from soil and rock within the protected catchments.

To improve performance against the water quality target for aluminium, Melbourne Water has undertaken work to optimise its treatment processes to reduce the level of aluminium remaining in the water supply from the water treatment process.

Leakage

Whilst the target for leakage was met in 2005/06, it was not met for the remaining two years of the 2005 regulatory period. Leakage for 2006/07 of 1% and for 2007/08 of 0.98% was higher than the target of 0.76% due to:

- The volume loss from draining pipes for maintenance and renewals purposes (0.7 GL), and leaks from fittings and off-takes, was not factored into the 2005 Water Plan target
- Given the actual volume of water delivered to customers was lower than that forecast in setting the 2005 Water Plan target, due to higher water restrictions and water conservation measures, the level of leakage appears higher because it is calculated as a percentage of water supplied.

5.1.2 Sewerage

Table 5.2 sets out the key performance indicators and actual results achieved over the 2005 regulatory period for sewerage services.

Table 5.2 – Key performance indicators for sewerage

Key Performance Indicator	2005/06		2006/07		2007/08	
	2005 WP target	Actual	2005 WP target	Actual	2005 WP target	Actual
Sewage spills (number)						
– hydraulic deficiency	4	3	4	1	4	5
– extreme wet weather	N/A	3	N/A	0	N/A	0
– system failure	0	0	0	0	0	1
Biosolids reuse (% reuse)						
– biosolids reused at ETP	100%	0%	100%	0%	100%	0%
– biosolids reused at WTP	33%	0%	33%	0%	33%	0%
Odour complaints (number) [40]						
– transfer system	18	18	16	11	11	8
– Eastern Treatment Plant	0	0	0	0	0	0
– Western Treatment Plant	0	0	0	0	0	0
EPA Victoria discharge licence requirements (% compliance)	100%	100%	100%	100%	100%	100%
Eastern Treatment Plant ammonia discharge limit (% compliance)	100%	100%	100%	100%	100%	100%
Western Treatment Plant nitrogen discharge limit (% compliance)	100%	100%	100%	100%	100%	100%

Sewage spills

Although all targets for sewage spills were met in 2005/06 and 2006/07, actual performance was slightly short of the targets for 2007/08.

The target for sewage spills due to hydraulic deficiency was not met for 2007/08, with actual spills exceeding the target by one spill. The spills occurred with heavy rainfall events overloading sewerage systems in December 2007. These spills are viewed as 'compliant' spills because the sewerage infrastructure where the spills occurred were built before the introduction of the current standard under the *State Environment Protection Policy (Waters of Victoria)* to contain flows resulting from up to a one-in-five year rainfall event. Melbourne Water is progressively implementing a program of works to eliminate spills in these areas over the 2009 and future regulatory periods.

As outlined in Chapter 7, the target for sewage spills due to hydraulic deficiency has been revised for the 2009 regulatory period to progressive achievement of zero annual spills, reflecting the new sewerage infrastructure being built and in particular the Northern Sewerage Project.

[40] An odour complaint is classified as an offensive odour complaint if it is confirmed by EPA Victoria as a licence breach.

The target for sewage spills due to system failure was not met for 2007/08, with actual spills exceeding the target by one spill. The spill occurred due to a leaking valve on a rising main out of a minor pumping station. Melbourne Water acted quickly to limit the spill to approximately 780 litres and implemented remedial action. A review of the maintenance schedule for all air valves on the rising main has been undertaken.

Spills occurring in extreme wet weather (due to storm events above a severity of up to one-in-five rainfall event) are outside the limits of the current sewerage system standard which contains flows resulting from up to a one-in-five rainfall event. Although there are no targets for these types of sewage spills, Melbourne Water monitors and reports spills of this nature.

Biosolids reuse

As noted above, Melbourne Water did not meet targets for biosolids reuse over the 2005 regulatory period.

The targets set in the 2005 Water Plan were based on Melbourne Water's 2002 biosolids beneficial use strategy to:

- Have annual production of biosolids at the Eastern Treatment Plant blended into soil products by 2005 and the stockpile reduced to sustainable levels by 2010
- Have the annual production of biosolids and a small proportion of the stockpile at the Western Treatment Plant used each year as a fuel source by 2005
- Remediate the biosolids stockpile at the Western Treatment Plant over the very long term as part of the Western Treatment Plant land use strategy.

The following issues were encountered in implementing the 2002 strategy:

- The non-typical properties of the biosolids (clay at the Eastern Treatment Plant and heavy metal contamination at the Western Treatment Plant) constrained the opportunities for sustainable reuse
- Previous soil-blending customers decided not to renew their biosolids supply agreements on expiry in 2005. During an Expression of Interest process in 2006, the soil blending businesses indicated that they did not wish to obtain more biosolids in the short term. Other opportunities are being pursued in place of soil blending. However, due to the nature of biosolids at the Eastern Treatment Plant, biosolids reuse opportunities are often large scale, infrequent and expensive, making setting and achieving annual targets difficult.

Since the 2005 Price Determination and the completion of a number of studies, new information identifying additional opportunities for beneficial use of biosolids has been obtained. The cost of doing so, however, was much higher than anticipated in the 2002 strategy. In light of these changed circumstances, Melbourne Water prepared a new biosolids strategy in 2005/06, which was assessed through the Department of Treasury and Finance's Gateway Process. The key activities of this new strategy include:

- Eastern Treatment Plant clay-rich biosolids stockpiles to be used as construction fill in road projects: Melbourne Water is currently awaiting the release[41] of EPA Victoria Guidelines for Environmental Management for the use of biosolids as a construction fill, which will enable the safe use of biosolids in road and other civil construction. Once these Guidelines are available, Melbourne Water will work with construction contractors and fill suppliers to progress this opportunity

[41] EPA Victoria has indicated that these guidelines will be released in late 2008.

- Western Treatment Plant stockpiles to be used for energy recovery: A feasibility study into the possible use of the older, more contaminated, stockpiles of biosolids stored at the Western Treatment Plant has been completed and Melbourne Water is assessing reuse options. Should technical trials and commercial negotiations be successful, the business case for the Western Treatment Plant biosolids waste to energy recovery project will be completed with a view to implementation within the 2009 regulatory period. A revised Biosolids Strategy is expected to be completed in 2009
- Increased research into other uses including land application and decontamination technologies: An Expression of Interest process identified a number of alternative decontamination and recycling concepts that are currently being assessed through Melbourne Water's applied biosolids research program. The assessment of alternative decontamination and recycling concepts will be an ongoing process with advances and continuous improvement in technology.

Melbourne Water will continue its efforts to progress opportunities to achieve sustainable use of ongoing biosolids production and reduction of biosolids stockpiles over the longer term.

Odour complaints

Targets for odour complaints from the transfer system and at the Eastern and Western treatment plants were met over 2005 regulatory period.

Melbourne Water's Odour Management Strategy is currently being implemented. The Strategy targets the most significant sources of odour emission in the transfer network and at the sewage treatment plants to ensure ongoing compliance in light of urban expansion, particularly near the Western Treatment Plant.

Specific strategy requirements for the Western Treatment Plant are currently being finalised following a recent, comprehensive 12 month odour risk assessment study. The outcomes of this study provide a robust framework for additional odour reduction works to be undertaken during the 2009 regulatory period, ensuring continuous improvement in line with regulatory requirements.

Compliance with EPA Victoria discharge licence requirements

Melbourne Water achieved 100% compliance with EPA Victoria discharge licence requirements over the 2005 regulatory period. However, for 2005/06, two penalty infringement notices were issued relating to a supernatant spill.[42] A detailed investigation was undertaken in relation to the spill and, as a result, equipment has been upgraded and processes improved to avoid similar incidents in the future.

Eastern Treatment Plant ammonia discharge limit

Melbourne Water has complied with EPA Victoria discharge licence requirements on ammonia limits at the Eastern Treatment Plant over the 2005 regulatory period. The upgrade of the existing aeration tanks was completed in late 2007 to meet the new licence requirement for 2007/08 of annual median ammonia concentration of 5mg/L.

[42] The licence requirements are in relation to discharges to the environment where as the penalty infringement notices were issued in relation to a spill at the Eastern Treatment Plant.

Western Treatment Plant nitrogen load to Port Phillip Bay

Melbourne Water has complied with EPA Victoria discharge licence requirements for nitrogen loads to Port Phillip Bay over the 2005 regulatory period. In 2004/05, lagoon systems upgrades at the Western Treatment Plant were completed as part of an Environment Improvement Project to increase the plant's capacity to reduce nitrogen loads to meet EPA Victoria requirements.

5.1.3 Recycled water

Table 5.3 sets out the key performance indicators and actual results achieved over the 2005 regulatory period for recycled water services.

Table 5.3 – Key performance indicators for recycled water

Key Performance Indicator	2005/06		2006/07		2007/08	
	2005 WP target	Actual	2005 WP target	Actual	2005 WP target	Actual
Percentage of recycled water achieved by Melbourne Water	N/A	14.6%	N/A	22.7% [43]	N/A	23.5% [44]
Contribute 19.6% to the Governments target to recycle 20% of Melbourne's wastewater by 2010	N/A	13.4%	N/A	20.9%	19.6%	21.5%

Melbourne Water has increased recycled water use as a percentage of inflows from the Eastern and Western Treatment Plants from 14.6% in 2005/06 to 23.5% in 2007/08. In addition, recycled water was supplied (15,930ML in 2007/08) for the conservation and management of biodiversity values of the Ramsar listed wetlands at the Western Treatment Plant.

Continued drought conditions, water conservation measures and water restrictions have resulted in higher recycled water usage over the 2005 regulatory period. Melbourne Water also commenced supplying recycled water to McKillop College and the Werribee Technology Precinct within this regulatory period.

The ongoing drought and water conservation measures have also reduced sewage inflows to the treatment plants, further increasing the percentage of water recycled.

[43] Result excludes recycled water supplied for environmental flows. If environmental flows were included, recycled water use would increase to 27.9% .

[44] 2007/08 result excludes recycled water supplied for environmental flows.

5.1.4 Corporate

Table 5.4 sets out the key performance indicators and actual results achieved over the 2005 regulatory period for corporate services.

Table 5.4 – Key performance indicators for corporate services

Key Performance Indicator	2005/06		2006/07		2007/08	
	2005 WP target	Actual	2005 WP target	Actual	2005 WP target	Actual
CO2 equivalent emissions	N/A	319,335[45] tonnes	N/A	265,770 tonnes	338,966[46] tonnes	284,464 tonnes
Complaints to EWOV[47]	3	17	3	13	3	27

CO_2 equivalent emissions

Melbourne Water's performance against the greenhouse gas emissions target for 2007/08 was 284,464 tonnes. This is equivalent to a 50% reduction on 2000/01 emissions which far exceeds the target of 40% reduction on 2000/01 emissions.[48]

Melbourne Water is one of the biggest Victorian electricity users and a major producer of greenhouse gases in Victoria. Significant reductions in greenhouse gas emissions have been achieved as a result of ceasing land and grass filtration at the Western Treatment Plant, generating biogas (stage 2) at the Western Treatment Plant, measuring energy efficiency and increasing sequestration through the management of stream frontages by planting trees. Calculated emissions are based on factors established by the Australian Greenhouse Office. These are varied as the types of electricity generation (e.g. hydroelectric, brown coal) are combined to determine the overall factor for providing electricity through the grid.

The Australian Greenhouse Office's December 2006 workbook varied some factors both for future emissions and for some past emissions. Melbourne Water adjusted its inventory accordingly using the new factors which resulted in the amounts emitted varying from plan.

[45] Revised result due to new Australian Greenhouse Office factors effected December 2006.

[46] 60% of 564,943 tonnes, with 40% reduction target.

[47] Total of complaints referred to provider, complaints referred to higher level contact and complaints for full investigation.

[48] The baseline emissions in 2000/01 were revised to 564,943 tonnes due to new Australian Greenhouse Office factors.

Complaints to the Energy and Water Ombudsman (EWOV)

The Commission's 2005 Price Determination set Melbourne Water a target of three EWOV complaints per year for the 2005 regulatory period. Melbourne Water received up to 27 complaints[49] (for the whole of business) per annum in the 2005 regulatory period.

Due to Melbourne Water's role as the bulk supplier of water and sewerage services in Melbourne, a smaller number of complaints are received in relation to these services compared to other water businesses. The majority of complaints it does receive relate to Melbourne Water's charges for the provision of waterways and drainage services in the Port Phillip and Westernport region.

Melbourne Water has systems, processes and personnel in place to investigate and resolve complaints and all of the complaints received were given due consideration.

5.1.5 Service standard outcomes for 2008/09

In the Commission's September 2008 *Supplementary Guidance on Water Plans*, water businesses have been directed to detail the outcomes that were delivered in the 2005 regulatory period and during 2008/09, including meeting service standard targets.

Melbourne Water's service standards for 2008/09 have been set to align with those being proposed for the 2009 regulatory period. As discussed in Chapter 7, this includes some changes to the standards set for 2007/08. Consistent with the approach adopted in Melbourne Water's 2008/09 Corporate Plan, service standards in relation to water quality, sewage spills and odour have been increased, with further refinements being made to biosolids reuse, greenhouse gas emissions and leakage, to reflect actual performance.

The 2009 Water Plan does not include information on progress against service standard targets for 2008/09. Performance data on service standards is generally collected on an annual basis. Melbourne Water considers that data for the first quarter of the period will be preliminary and may not reflect the actual annual results that will be provided to the Commission as part of the 2008/09 performance reporting process.

[49] EWOV segregates complaints into 'complaints received for investigation', 'complaints referred to higher level contact', 'complaints referred to company' and 'complaints referred elsewhere and other complaints'. This result for the number of complaints excluded 'complaints referred elsewhere and other complaints'.

5.2 Actual capital expenditure associated with delivery of outcomes

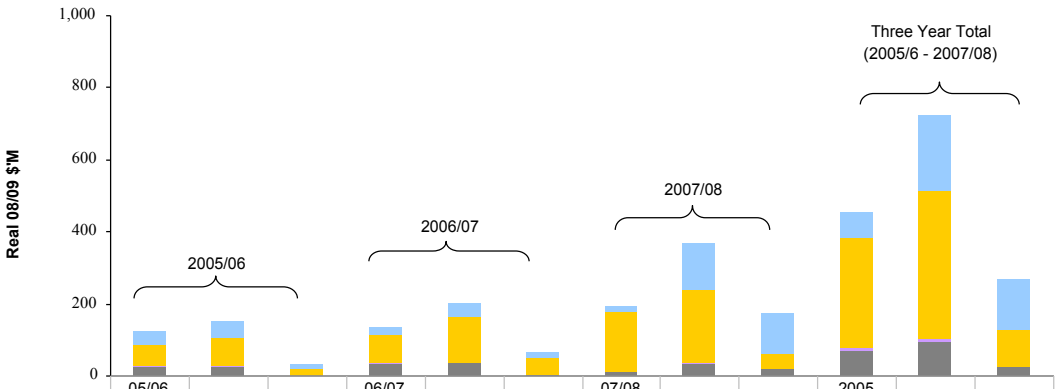
The Commission's 2005 Price Determination outlined its assessment of the capital expenditures associated with achieving the standards and outcomes detailed above. This section sets out the reasons for variations between the capital expenditure forecasts allowed by the Commission in the 2005 Price Determination and the actual expenditures over the 2005 regulatory period.

As outlined in section 5.1, Melbourne Water has achieved a high level of compliance against the targets set as part of the Commission's 2005 Price Determination. In delivering these targets and outcomes, and accommodating new obligations, Melbourne Water's capital expenditure was $269.1 million higher than forecast in the Commission's 2005 Price Determination. This is illustrated in Figure 5.1.

The higher than planned capital expenditure was largely driven by changing circumstances that were unforeseen at the time of the Commission's 2005 Price Determination:

- The ongoing drought and the need to improve security of supply
- New legislative and regulatory obligations not included in the 2005 Water Plan
- Changing costs associated with projects included in the 2005 Water Plan. There have been industry wide increases in construction costs over the 2005 regulatory period. Melbourne Water did not include provision for contingencies in the 2005 Water Plan for projects without formal project approval, as it considered that the compounding effects of these estimates would overstate the budget required. To improve the accuracy of project cost estimates in the 2009 regulatory period, for some projects Melbourne Water has explicitly taken account of project risk and uncertainty (see section 10.1.2)
- Additional asset condition and operational information, which in some instances has led to the building of projects not included in the 2005 Water Plan.

Figure 5.1: Total capital expenditure – 2005/06 to 2007/08



	05/06 Water Plan	05/06 Actual	05/06 Variance	06/07 Water Plan	06/07 Actual	06/07 Variance	07/08 Water Plan	07/08 Actual	07/08 Variance	2005 Water Plan	Actual Total	Variance Total
Water	35.3	48.3	13.0	21.4	38.0	16.6	16.5	127.1	110.6	73.2	213.3	140.1
Sewerage	58.5	77.0	18.4	81.0	125.0	44.0	165.8	206.0	40.2	305.3	408.0	102.7
Recycled Water	3.1	4.8	1.7	4.0	2.0	-2.0	0.0	0.4	0.4	7.1	7.2	0.1
Corporate allocation	25.1	24.2	-0.9	31.2	36.9	5.7	13.6	34.9	21.3	69.9	96.0	26.1
Total	**122.0**	**154.3**	**32.3**	**137.6**	**201.9**	**64.2**	**195.8**	**368.3**	**172.5**	**455.4**	**724.5**	**269.1**

Melbourne Water has processes in place to ensure that the additional capital expenditure incurred over the 2005 regulatory period is prudent and efficient. This includes its capital planning and delivery framework and asset management system. Melbourne Water has drawn on the lessons leaned over the 2005 regulatory period to make substantial changes to its capital planning and delivery processes to better position the business to deliver future requirements. These improvements are outlined in Chapters 9 and 10.

5.2.1 Water

In the 2005 Water Plan, Melbourne Water's capital expenditure for water services was forecast to decrease as no further investment in new water sources were planned and a high degree of compliance with water quality requirements was being achieved. Significant capital expenditures that were planned included the upgrade of the Winneke Treatment Plant to improve security of supply, the upgrade of the fluoridation plant at Silvan Reservoir and the replacement of major cast iron and wrought iron water mains (over 100 years old and at risk of failure).

As illustrated in Figure 5.2, actual water infrastructure capital expenditure over the 2005 regulatory period was $140.1 million higher than that reflected in the Commission's 2005 Price Determination.

Higher than planned capital expenditure in 2005/06 was largely due to the Winneke Treatment Plant capacity upgrade project (an additional $9.6 million).

Actual capital expenditure for 2006/07 and 2007/08 was higher than planned as a result of the need to improve security of supply with new water sources. This included costs associated with meeting the following new obligations:

- The design and construction of the Sugarloaf Pipeline connecting the Melbourne supply system to the Goulburn River, consistent with the State Government's Water Plan (an additional $41.8 million)
- Bringing forward the reconnection of Tarago Reservoir, and construction of a water treatment plant, consistent with the CRSWS (an additional $30.3 million).

In addition, the drought and higher risk of bushfires have also meant that:

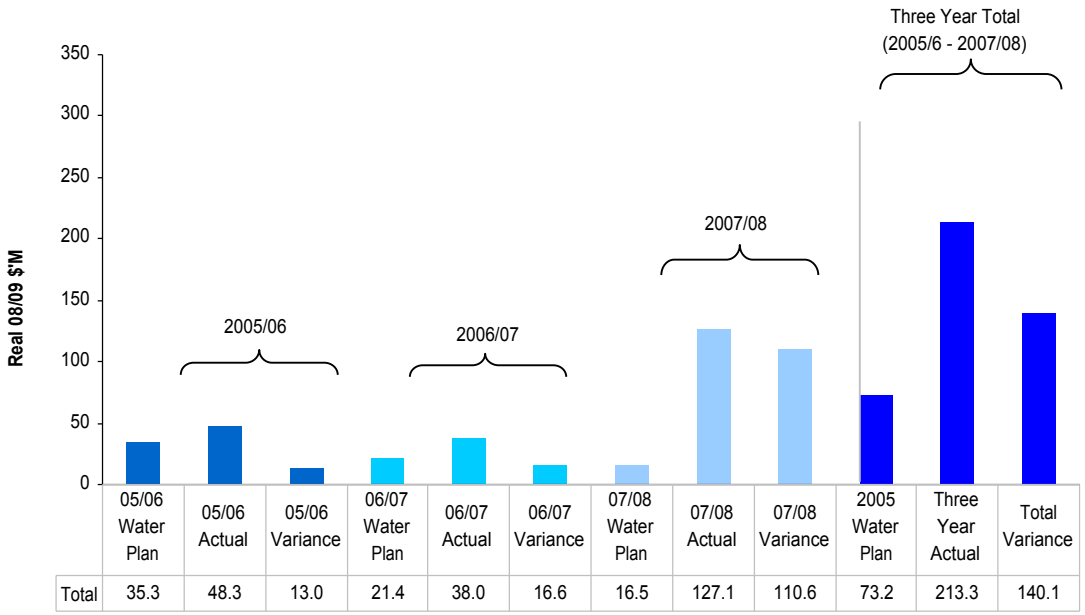
- More catchment bridge renewals were required resulting from the revised condition assessments which have regard to bushfire access (an additional $3.3 million)
- Installation of filtration plants in the Upper Yarra Townships for water supply during emergencies (an additional $7.5 million)
- Installation of an aerator in the Upper Yarra Reservoir to address higher levels of manganese in the water and water quality issues as a result of the ongoing drought (an additional $1.6 million).

Chapter 5
Outcomes over the 2005 regulatory period

Business as usual capital expenditure increased over the 2005 regulatory period as a result of further and more refined planning information becoming available:

- Stage 1 of the St Albans – Werribee Pipeline replaced the St Albans booster pump station augmentation; revised peak day forecasts from City West Water indicated that increased capacity will be required (an additional $4.1 million)
- Revised asset condition assessments required floor replacements and upgrades for the St Albans tank to address leakage issues (an additional $7.8 million).

Figure 5.2: Water capital expenditure – 2005/06 to 2007/08



	05/06 Water Plan	05/06 Actual	05/06 Variance	06/07 Water Plan	06/07 Actual	06/07 Variance	07/08 Water Plan	07/08 Actual	07/08 Variance	2005 Water Plan	Three Year Actual	Total Variance
Total	35.3	48.3	13.0	21.4	38.0	16.6	16.5	127.1	110.6	73.2	213.3	140.1

5.2.2 Sewerage

In the 2005 Water Plan, Melbourne Water's capital expenditure for sewerage services was forecast to increase. In particular, expenditures were required on works to meet EPA Victoria licence requirements at the Eastern Treatment Plant as well as sewer capacity augmentations to reduce the risk of sewage spills in the transfer system. Other significant expenditures included the odour reduction works at the Eastern Treatment Plant.

As illustrated in Figure 5.3, actual capital expenditure over the 2005 regulatory period was $102.7 million higher than that reflected in the Commission's 2005 Price Determination.

Capital expenditure at the Western Treatment Plant has increased due to the projects listed below. This includes projects that were a part of the Commission's 2005 Price Determination, as well as projects that at the time of the 2005 Price Determination, were unforeseen:

- Further requirements from EPA Victoria in relation to the approach to be adopted for sludge transfer and processing meant that a thicker clay liner was required to prevent groundwater contamination (an additional $29.5 million)
- Updated odour risk assessment information, and timing of proposed development surrounding the Western Treatment Plant (e.g. the Werribee River Park, Wyndham Cove Marina and Riverwalk), have resulted in the implementation of the Western Trunk Sewer odour control facility (an additional $9.8 million). The works ensure compliance with EPA Victoria licence requirements
- Additional works required for the 25 West lagoon system ($4.5 million). Specifically, an additional aeration blower was required to mitigate an operational risk only identified once the new aeration process was in place. Further, following a substantial tear to the lagoon cover, after a wind event, investigations, design and reconstruction works were required.

Capital expenditure at the Eastern Treatment Plant has also increased due to:

- The upgrade of six existing aeration tanks has been completed and construction of additional tanks is likely to be completed ahead of schedule by 2010 to ensure compliance with EPA Victoria licence ammonia reduction requirements and to provide for load growth (an additional $21.7 million due to refined cost estimates)
- Construction delays associated with the Eastern Green Energy Project (an additional $15.8 million)
- More detailed design and cost information becoming available for the Waste Activated Sludge System upgrade (an additional $4.3 million) and the refurbishment and upgrade of the heat reservoir system[50] which was in poor operational condition (an additional $4.3 million)
- Expenditure on refurbishment of channel aeration pipework (involving sediment transfer pipe work and diffuser replacement) increased due to refined scope and cost estimates ($6.3 million additional cost)
- Expenditure on sludge drying pans refurbishment Stage 8-9 undertaken to match renewal works to the deterioration rate of the pans ($16.7 million additional cost).

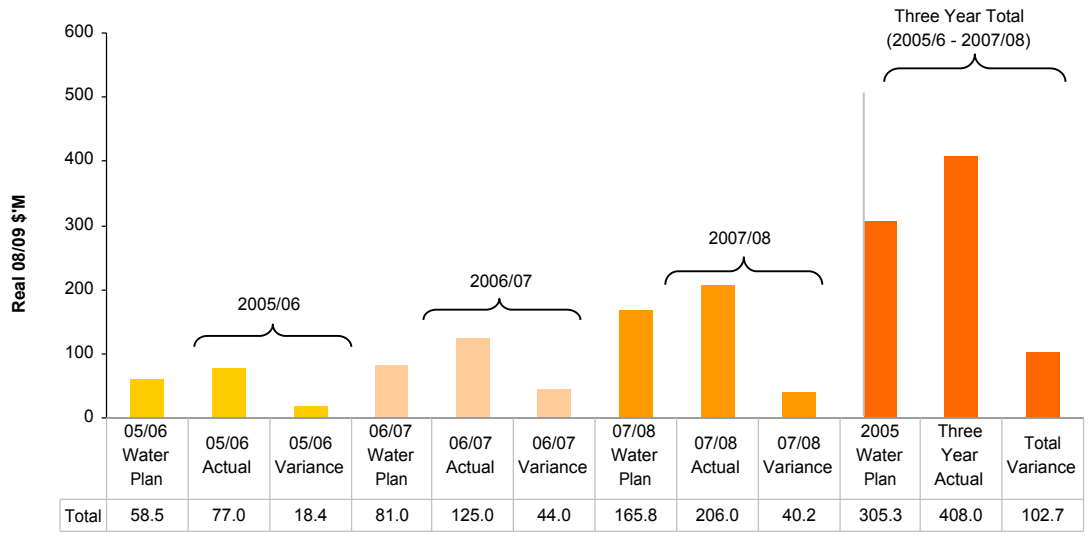
Capital expenditure on the sewerage transfer system has also increased due to the Northern Sewerage Project. Findings arising from more detailed geotechnical investigations and detailed design necessitated changes to the scope of works, such as relocating shafts, and realigning the tunnel to respond to community issues, as well as general construction cost escalations (an additional $10.7 million).

[50] Further information became available following the tender process.

Melbourne Water has in place appropriate systems to monitor capital expenditures and ensure that project priorities and timing reflect best available information and are prudent and efficient. The cost increases outlined above have been partly offset through project reprioritisation and deferral. For example:

- Re-profiling of expenditure on the Eastern Treatment Plant tertiary treatment project while awaiting the outcome of the Eastern Water Recycling Project feasibility and business case assessments, as well as further monitoring required by EPA Victoria on the impact of shoreline discharges of treated secondary level effluent at Boags Rocks ($19.9 million)
- Reduction in the scope and cost estimates for Eastern Treatment Plant sludge drying pan refurbishments Stages 5-7 (a saving of $16.1 million)
- Removal of the Eastern Treatment Plant final effluent screens project from the capital program ($11.2 million)
- Deferral of the Ringwood South branch sewer augmentation following consultation with retail water businesses, EPA Victoria and State Government ($3.8 million).

Figure 5.3: Sewerage capital expenditure – 2005/06 to 2007/08



	05/06 Water Plan	05/06 Actual	05/06 Variance	06/07 Water Plan	06/07 Actual	06/07 Variance	07/08 Water Plan	07/08 Actual	07/08 Variance	2005 Water Plan	Three Year Actual	Total Variance
Total	58.5	77.0	18.4	81.0	125.0	44.0	165.8	206.0	40.2	305.3	408.0	102.7

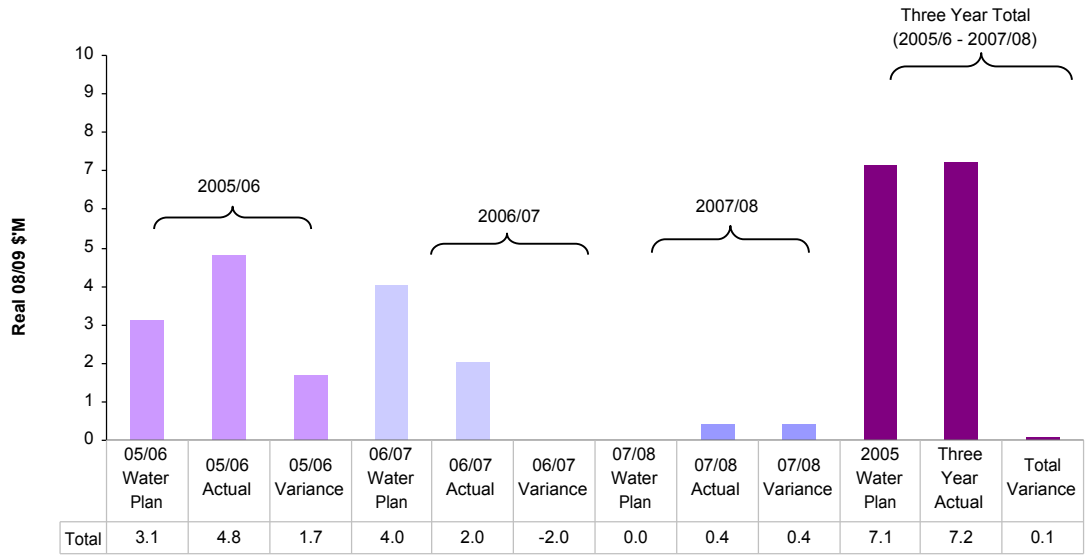
5.2.3 Recycled water

Capital expenditure forecasts for recycled water over the 2005 regulatory period included expenditure on the Wyndham Third Pipe project, the salt reduction (desalination) plant business case at Western Treatment Plant and the Werribee Technology Precinct and Tourist Precinct projects.

As illustrated in Figure 5.4, actual capital expenditure over the 2005 regulatory period is very close to that allowed for in the Commission's 2005 Price Determination.

Project reprioritisations were undertaken as a result of the project for the salt reduction plant at Western Treatment Plant no longer being advanced due to economic considerations (the full cost recovery price exceeded recycled water customers' willingness to pay). Cost savings from not completing the business case have been offset by costs associated with a number of necessary but unforeseen projects, such as pump station upgrades and the recycled water standpipe, which is providing recycled water to customers for drought relief.

Figure 5.4: Recycled water capital expenditure – 2005/06 to 2007/08



	05/06 Water Plan	05/06 Actual	05/06 Variance	06/07 Water Plan	06/07 Actual	06/07 Variance	07/08 Water Plan	07/08 Actual	07/08 Variance	2005 Water Plan	Three Year Actual	Total Variance
Total	3.1	4.8	1.7	4.0	2.0	-2.0	0.0	0.4	0.4	7.1	7.2	0.1

5.2.4 Corporate

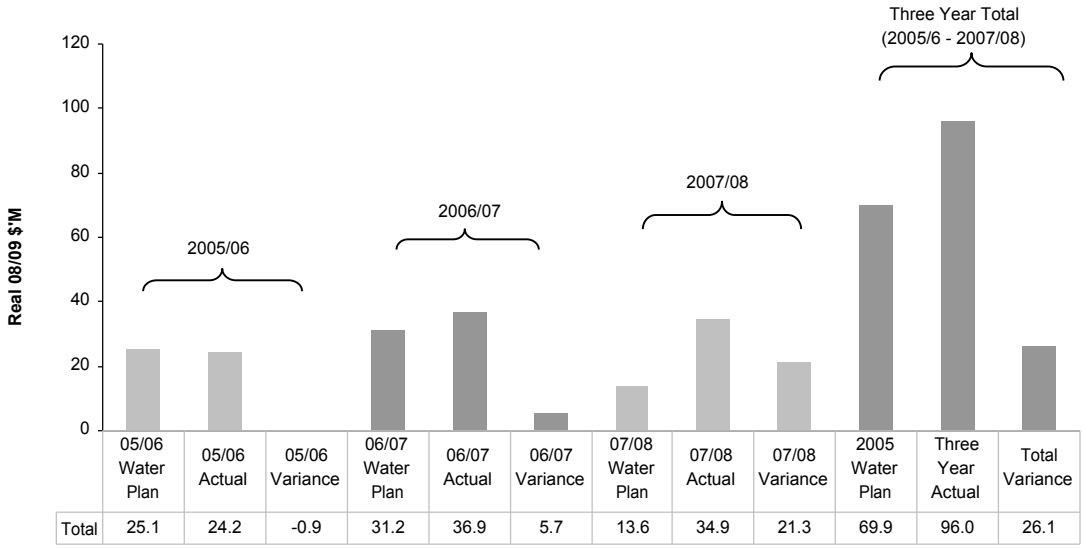
In the 2005 Water Plan, capital expenditure on corporate activities was forecast to decrease over the 2005 regulatory period.

As illustrated in Figure 5.5, actual capital expenditure over the 2005 regulatory period was $26.1 million higher than that reflected in the Commission's 2005 Price Determination.

The higher than planned capital expenditure is primarily driven by expenditure on mini-hydro generators which was not incorporated in the 2005 Water Plan (an additional $15.7 million). Previously, activities and expenditures associated with hydroelectric generation have been considered part of Melbourne Water's 'unregulated' business. For the purposes of the 2009 regulatory period, Melbourne Water is proposing that expenditures associated with the mini-hydros be treated as a part of Melbourne Water's 'regulated' business on the basis that these projects will derive operational efficiencies for the business and result in lowering customer prices through energy savings. This is further discussed in Chapter 6, section 6.3.3.

Other drivers for the increase in capital expenditure include upgrading and enhancing information technology systems to assist in delivering a larger capital program over the 2009 regulatory period ($12.4 million).

Figure 5.5: Corporate capital expenditure – 2005/06 to 2007/08



	05/06 Water Plan	05/06 Actual	05/06 Variance	06/07 Water Plan	06/07 Actual	06/07 Variance	07/08 Water Plan	07/08 Actual	07/08 Variance	2005 Water Plan	Three Year Actual	Total Variance
Total	25.1	24.2	-0.9	31.2	36.9	5.7	13.6	34.9	21.3	69.9	96.0	26.1

5.3 Actual operating expenditure associated with delivery of outcomes

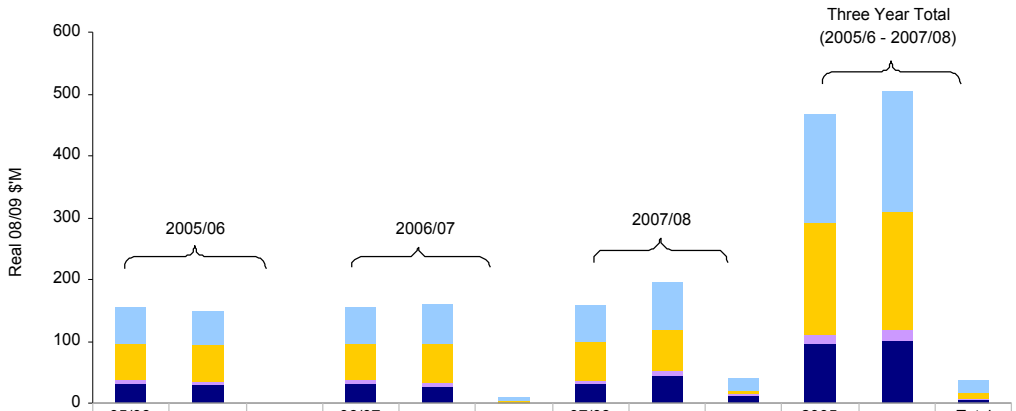
The Commission's 2005 Price Determination outlined the operating expenditure associated with achieving the standards and outcomes detailed in the 2005 Water Plan. This section sets out the reasons for variations between the operating expenditure forecasts allowed by the Commission in the 2005 Price Determination and the actual expenditure over the 2005 regulatory period.

As noted earlier, Melbourne Water has achieved a high level of compliance against the targets set as part of the Commission's 2005 Price Determination. In delivering these targets and outcomes, and accommodating new obligations, Melbourne Water's operating expenditure was $36.5 million higher than forecast in the Commission's 2005 Price Determination. This is illustrated in Figure 5.6.

The higher than planned operating expenditures were driven by changing circumstances over the 2005 regulatory period, and in particular:

- New legislative and regulatory obligations not included in the 2005 Water Plan
- Increased labour costs associated with pay increases above the 3.5% per annum[51] allowed in the Commission's 2005 Price Determination and additional staff to deliver a significant increase in Melbourne Water's capital program over the 2009 regulatory period
- Higher than planned business as usual expenditure associated with civil and mechanical and electrical maintenance.

Figure 5.6: Total operating expenditure – 2005/06 to 2007/08



	05/06 Water Plan	05/06 Actual	05/06 Variance	06/07 Water Plan	06/07 Actual	06/07 Variance	07/08 Water Plan	07/08 Actual	07/08 Variance	2005 Water Plan	Actual Total	Total Variance
Water	58.2	53.8	-4.4	58.9	62.8	3.9	58.2	78.0	19.8	175.3	194.6	19.3
Sewerage	59.3	59.5	0.2	59.8	65.2	5.4	61.8	66.2	4.4	180.9	190.9	10.0
Recycled Water	5.9	5.8	-0.1	4.5	4.8	0.3	4.5	6.1	1.6	14.9	16.7	1.8
Corporate	31.9	29.1	-2.8	31.8	27.3	-4.4	32.8	45.4	12.6	96.5	101.9	5.4
Total	155.2	148.2	-7.1	155.0	160.1	5.2	157.4	195.8	38.4	467.6	504.1	36.5

[51] Under the Enterprise Agreement an average 4% per annum increase was negotiated.

5.3.1 Water

In the 2005 Water Plan, operating expenditure on water services was forecast to remain stable over the 2005 regulatory period.

As illustrated in Figure 5.7, actual operating expenditure over the 2005 regulatory period was $19.3 million higher than that reflected in the Commission's 2005 Price Determination.

The higher than planned operating expenditure is primarily driven by new legislative and regulatory obligations that were not included in the 2005 Water Plan. These include:

- Investigations to examine large scale alternative sources of water supply options identified in the CRSWS ($6.9 million)
- Design studies for the Victorian Desalination Plant and Sugarloaf Pipeline in accordance with the State Government's Water Plan ($1.5 million)
- Bringing Tarago Reservoir back on line by 2009 consistent with the CRSWS ($0.5 million)
- Managing and maintaining the non-operational assets in the decommissioned Beaconsfield, Devilbend and Frankston reservoirs ($0.3 million)
- Management of Bulk Water Entitlements ($0.1 million).

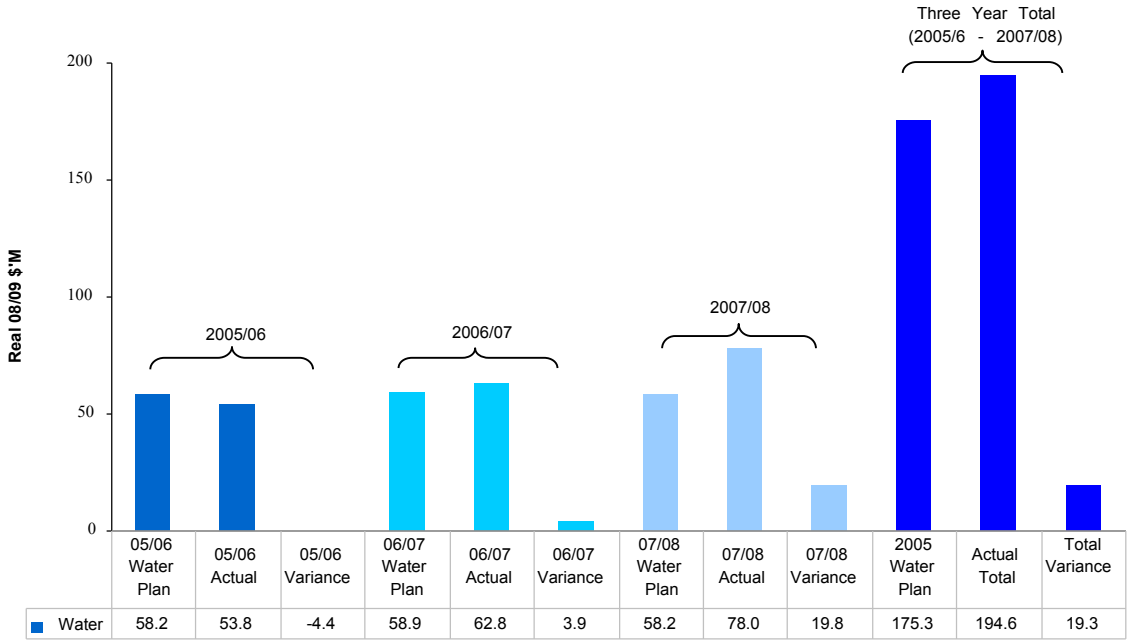
Higher business as usual operating expenditure over the 2005 regulatory period is due to:

- Increases as a result of higher than planned expenditure for labour. This is driven by pay increases above the 3.5% allowed in the Commission's 2005 Price Determination and by additional labour as the business positions itself to deliver a larger capital program driven by its obligations over the 2009 regulatory period ($7.1 million)
- Drought related costs including bushfire protection measures, recommissioning of Swingler Weir, work to reassemble the Thomson Dam lower outlet tower and higher water main burst repairs ($2.7 million)
- Higher sludge disposal costs at Winneke Treatment Plant due to increases in contract rates ($1.1 million).

The drivers of increased operating expenditure have been offset through cost savings that include:

- Contract renegotiations, leading to savings, e.g. transferral of conservation advertising to the Department of Sustainability and Environment ($2.3 million)
- Reduced contract costs associated with the Yan Yean plant being taken offline due to drought conditions ($1.1 million).

Figure 5.7: Water operating expenditure – 2005/06 to 2007/08



	05/06 Water Plan	05/06 Actual	05/06 Variance	06/07 Water Plan	06/07 Actual	06/07 Variance	07/08 Water Plan	07/08 Actual	07/08 Variance	2005 Water Plan	Actual Total	Total Variance
Water	58.2	53.8	-4.4	58.9	62.8	3.9	58.2	78.0	19.8	175.3	194.6	19.3

5.3.2 Sewerage

In the 2005 Water Plan, operating expenditure on sewerage services was forecast to increase slightly over the 2005 regulatory period.

As is illustrated in Figure 5.8, total actual operating expenditure over the 2005 regulatory period was $10.0 million higher than that reflected in the Commission's 2005 Price Determination.

The higher than planned operating expenditure is primarily driven by business as usual activities. Expenditure was incurred to meet the new regulatory obligation of modelling the environmental effects of modifying effluent discharge flows at the Eastern Treatment Plant resulting from an amendment to Melbourne Water's discharge licence by EPA Victoria (an additional $0.5 million).

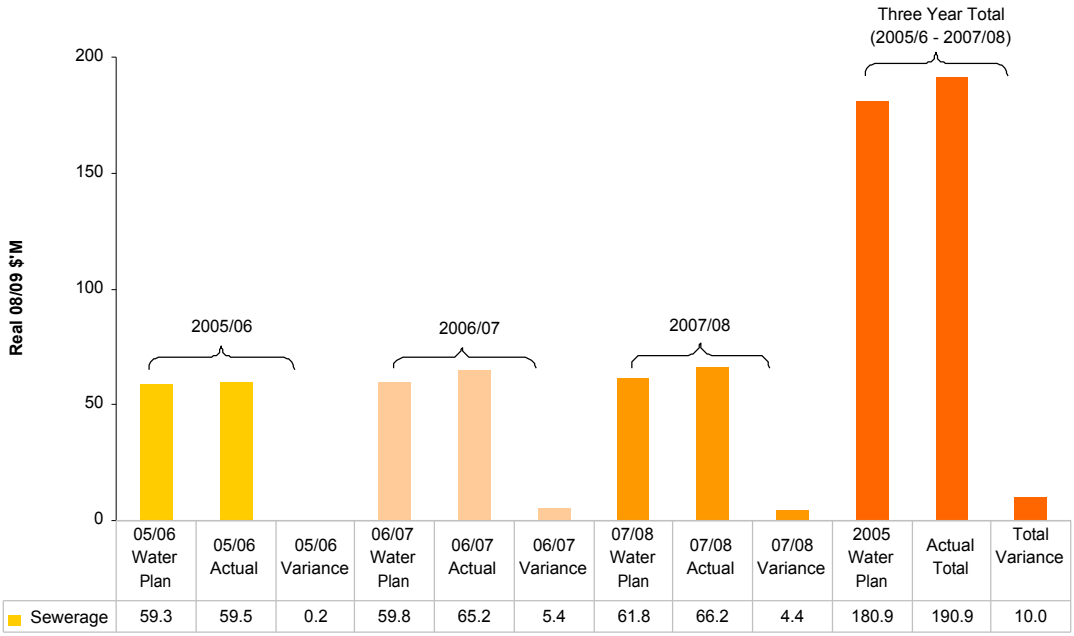
Increases in business as usual activities are due to a combination of the following factors:

- Higher than planned expenditure for labour. This is driven by pay increases above the 3.5% allowed in the Commission's 2005 Price Determination and by additional labour as the business positions itself to deliver a larger capital program driven by its obligations over the 2009 regulatory period ($2.7 million)
- Higher mechanical and electrical maintenance costs at the Western Treatment Plant largely as a result of repairs to ageing odour control and plant equipment along with preventative maintenance to reduce pump failures ($3.7 million)
- Construction delays in the Eastern Green Energy Project which resulted in higher than planned fuel and energy bills and breakdown maintenance required on the existing power plant and outfall pumping station ($2.5 million)
- Further operational assessments identifying issues with sludge build up under the lagoon covers at the Western Treatment Plant and the subsequent trials associated with the

undercover sludge harvesting to provide an innovative and cost-effective solution for a unique and challenging treatment application ($1.5 million).

Increases in operating expenditure have been partially offset by savings, including those from biosolids reuse projects not proceeding following delays in the launch of new environmental guidelines by EPA Victoria ($3.9 million).

Figure 5.8: Sewerage operating expenditure – 2005/06 to 2007/08



	05/06 Water Plan	05/06 Actual	05/06 Variance	06/07 Water Plan	06/07 Actual	06/07 Variance	07/08 Water Plan	07/08 Actual	07/08 Variance	2005 Water Plan	Actual Total	Total Variance
Sewerage	59.3	59.5	0.2	59.8	65.2	5.4	61.8	66.2	4.4	180.9	190.9	10.0

5.3.3 Recycled water

In the 2005 Water Plan, operating expenditure on recycled water services was forecast to decrease over the 2005 regulatory period.

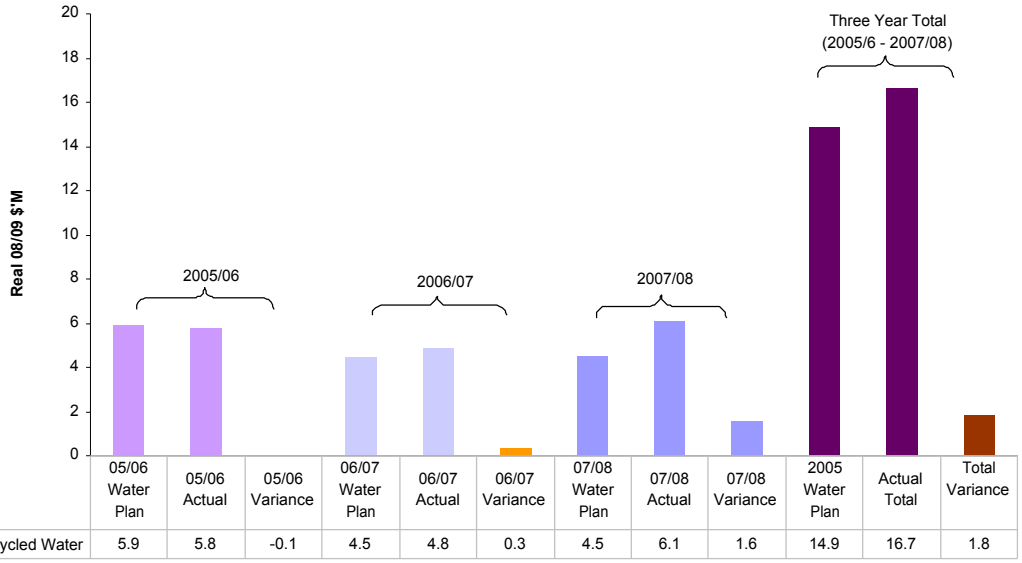
As illustrated in Figure 5.9, total actual operating expenditure over the 2005 regulatory period is slightly more ($1.8 million) than that reflected in the Commission's 2005 Price Determination.

The higher than planned operating expenditure is due to new monitoring and chemical risk assessments for recycled water quality in response to customer feedback over the 2005 regulatory period ($1.4 million).

The costs associated with meeting the new obligation of investigating the Eastern Water Recycling Project as a large scale alternative option of water supply, identified in the CRSWS ($1.8 million), were offset by savings from recycled water projects not being further progressed beyond the feasibility study stage.[52]

[52] Projects not progressed beyond the feasibility study stage due to being superseded by more viable projects.

Figure 5.9: Recycled water operating expenditure – 2005/06 to 2007/08



	05/06 Water Plan	05/06 Actual	05/06 Variance	06/07 Water Plan	06/07 Actual	06/07 Variance	07/08 Water Plan	07/08 Actual	07/08 Variance	2005 Water Plan	Actual Total	Total Variance
Recycled Water	5.9	5.8	-0.1	4.5	4.8	0.3	4.5	6.1	1.6	14.9	16.7	1.8

5.3.4 Corporate

Operating expenditure on corporate services was forecast to remain relatively stable over the 2005 regulatory period, with only a slight increase in 2007/08.

As illustrated in Figure 5.10, total actual operating expenditure over the 2005 regulatory period for corporate services was $101.9 million. This total does not include corporate expenditures of $71.0 million that were allocated to waterway services as part of the 2008 Waterways Water Plan.

Total actual operating expenditure over the 2005 regulatory period is $5.4 million higher than that reflected in the Commission's 2005 Price Determination.

The higher than planned operating expenditure is primarily driven by business as usual activities. However, additional expenditure was incurred on investigating options for meeting the new regulatory obligation of applying the State Government's sustainable management principles to Melbourne Water's programs and activities ($1.3 million).

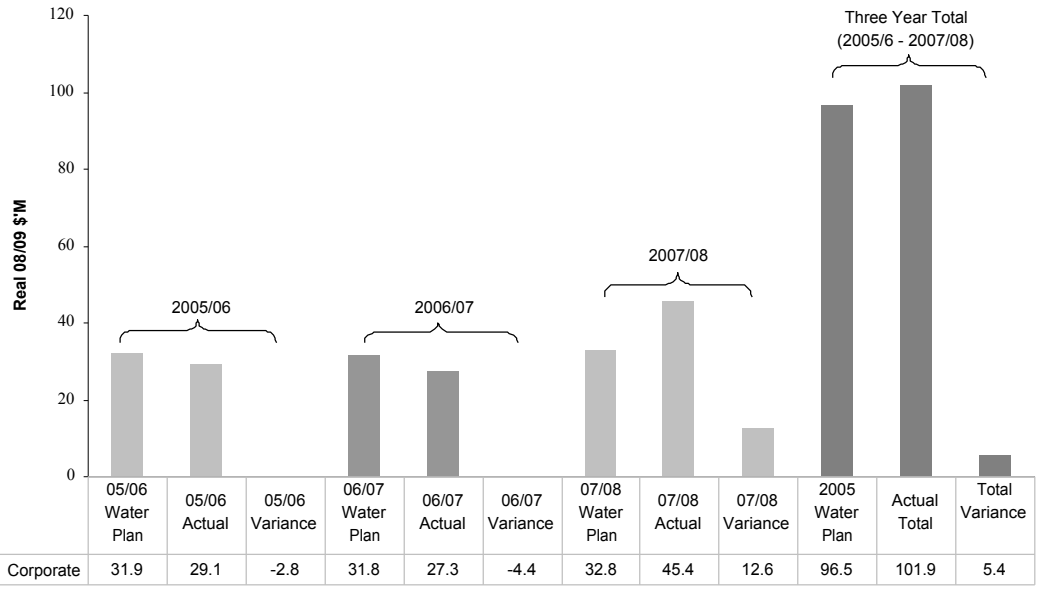
Increases in business as usual activities are due to a combination of the following factors:

- Higher than planned expenditure for labour as a result of pay increases above the 3.5% allowed in the Commission's 2005 Price Determination and additional labour to provide corporate support for the increases in labour for water and sewerage services ($4.3 million)
- Reduction in the value of Melbourne Water's defined benefit superannuation fund in 2007/08 mainly due to a decline in share-market returns ($18.1 million)
- The Commission's licence fee costs were higher than allowed for in its 2005 Price Determination ($1.8 million)
- Increased leasing costs to accommodate additional labour required to deliver a larger capital program ($1.0 million).

Increases in operating expenditure have been partially offset by savings, including those from:

- Decreases in insurance premium costs due to favourable market conditions and renegotiation of insurance policies ($15.7 million)
- Improved processes resulting in greater use of the inter/intranet for communications ($2.9 million).

Figure 5.10: Corporate services operating expenditure – 2005/06 to 2007/08



	05/06 Water Plan	05/06 Actual	05/06 Variance	06/07 Water Plan	06/07 Actual	06/07 Variance	07/08 Water Plan	07/08 Actual	07/08 Variance	2005 Water Plan	Actual Total	Total Variance
Corporate	31.9	29.1	-2.8	31.8	27.3	-4.4	32.8	45.4	12.6	96.5	101.9	5.4

5.4 Actual demand outcomes

Table 5.5 sets out the actual and forecast demands over the 2005 regulatory period for water and sewage.

Table 5.5 – Actual and forecast water and sewage demands – 2005/06 to 2007/08

	2005/06			2006/07			2007/08		
	Forecast (GL)	Actual (GL)	Variance (GL)	Forecast (GL)	Actual (GL)	Variance (GL)	Forecast (GL)	Actual (GL)	Variance (GL)
Water	480.4	445.2	-35.2	485.5	412.8	-72.7	484.2	381.3	-102.9
Sewage	330.6	300.3	-30.3	334.9	272.7	-62.2	337.2	266.1	-71.1

Actual water demand over the 2005 regulatory period was 211GL or 14.5% lower than that reflected in the Commission's 2005 Price Determination. The lower than forecast demand for water is primarily due to higher water restrictions and water conservation efforts which have seen water consumption levels fall below the long term average. Actual growth in customer numbers has exceeded the retail water businesses forecasts which indicate that the lower demand was largely driven by a reduction in per capita consumption.

Actual sewage volumes received at Melbourne Water's treatment plants were 164GL or 16.3% lower than that reflected in the Commission's 2005 Price Determination. The lower than forecast sewage volumes are primarily due to lower indoor water use, increased grey water recycling and lower inflows and infiltration into Melbourne Water's and the retail water businesses' sewerage systems from rainfall events.

In contrast to water and sewage demand, drought and low availability of water from other sources has contributed to a significant increase in the demand for recycled water. For example, recycled water used by Melbourne Water on-site at Western Treatment Plant and Eastern Treatment Plant, and supplied to the retail water businesses has increased from 43.8GL in 2005/06 to 61.1GL in 2006/07 and 62.0 GL in 2007/08 (excluding environmental flows).

5.5 Delivery of key capital projects

The Commission outlined in its 2005 Price Determination the key capital projects that Melbourne Water would undertake over the 2005 regulatory period. Table 5.6 summarises Melbourne Water's progress in delivering these projects and demonstrates Melbourne Water's ability to deliver projects on time, particularly where there are no externally imposed delays or improved information.

Table 5.6 also outlines, where appropriate, the factors impacting on the expected date of project completion provided in the 2005 Price Determination. These variances have not affected the level of service provided to customers, but reflect necessary changes to Melbourne Water's Capital Plan in light of changing priorities, significant new obligations, improved information and externally imposed delays.

Table 5.6: Major Capital Projects

Product/Project	Outputs to be achieved in the 2005 regulatory period	Current status as at June 2008
Water		
Morang Outlet Main Replacement	Stage 4, replacing 2.8km of pipeline, to be delivered by the end of 2005/06 Stage 5, replacing 2.1km of pipeline, to be delivered by the end of 2007/08 Stage 6, replacing 1.4km of pipeline and abandoning approximately 1.8km of old pipeline to be delivered by the end of 2008/09	Stage 4 was completed in June 2006 Stage 5 was completed in November 2007 Stage 6 is currently in final stages of design with completion scheduled for June 2009
Morang-Preston Main Replacement	Replacement of 10km of pipeline by the end of 2006/07	Works completed in July 2006
Winneke Treatment Plant Emergency Capacity Upgrade	Upgrade to be delivered by the end of 2005/06	Works 95% complete at the end of 2005/06 and fully complete in January 2007 following performance testing
St Albans Booster Pump Station	Augmentation of the St Albans Booster Pump Station	Project replaced with St Albans to Werribee water main (Stage 1) as a result of revised peak demand forecasts from City West Water. Works scheduled for completion by December 2008
Sewerage		
Eastern Treatment Plant Sludge Drying Pan and Digestion Upgrade for growth	Upgrade to be delivered by the end of 2007/08[53]	Sludge Drying Pan upgrade completed by the end of June 2006 Digestion augmentation is progressing as scheduled. Expected completion date is by March 2009
Eastern Treatment Plant Sludge Drying Pan Refurbishment for renewals (stages 5,6,7)	40% of the planned expenditure to be delivered by the end of 2007/08. This will include further monitoring, design and progress on pan refurbishment and replacement	Sludge Drying Pans refurbishment is complete. Much of the 2007/08 works started in 2006/07 due to dry weather conditions
Eastern Treatment Plant Final Effluent Screens	Screens to be delivered by the end of 2007/08	Project terminated due to impact of impending plant upgrade to tertiary treatment

[53] The Capital Plan supporting Melbourne Water's 2005 Water Plan shows expenditures in 2008/09 for the Digestion Augmentation, suggesting the intention was to deliver the project in 2008/09, not by the end of 2007/08.

Product/Project	Outputs to be achieved in the 2005 regulatory period	Current status as at June 2008
Eastern Treatment Plant Outfall Sewer	Contingent on the outcome of the Eastern Water Recycling Proposal feasibility study, 9% of total planned expenditure to be delivered by the end of 2007/08. This will include geotechnical investigations, concept development and planning approvals	Project delayed to await (a) the outcome of major recycling proposals business case assessment, (b) results of further monitoring and modelling required by EPA Victoria on the impact of shoreline discharge of effluent at Boags Rocks under different flow regimes, and (c) the outcome of advanced treatment pilot trials as part of the tertiary treatment upgrade works
Eastern Treatment Plant Aeration Tank Upgrade (ie. Ammonia Reduction Upgrade)	60% of the planned expenditure to be delivered by the end of 2007/08. This will include completion of works within the existing aeration tanks, design of new tanks and commencement of on-site works for new tanks	The six existing aeration tanks were progressively converted to the new process configuration required to reduce ammonia levels in the effluent, and the new process was successfully commissioned in 2007. The second phase of works involves construction of four additional tanks, and this is proceeding well with commissioning expected in 2009/10
Eastern Treatment Plant Tertiary Treatment	Contingent on the outcome of the Eastern Water Recycling Proposal feasibility study, 25% of total planned expenditure to be delivered by the end of 2007/08. This will include completing project design and commencing procurement and on-site works	Following a government announcement in 2006 the works commenced with the design and construction of a facility to trial tertiary treatment technologies in 2007. In February 2008 Melbourne Water commenced the 12-month trials to determine the best possible treatment method, and help to design the works and refine the cost of the upgrade, which is due to be commissioned in late 2012
Ringwood South Branch Sewer	Sewer to be delivered by the end of 2007/08	Project initially delayed due to more complex and larger scale than originally forecast. Detailed design was to be completed by end 2007/08 with the project due for completion by 2011. The project has now been deferred until the 2013 regulatory period as a result of prioritisation of the large scale water supply augmentations announced in the State Government's Water Plan
Melbourne Main Sewer Augmentation	50% of the planned expenditure to be delivered by the end of 2007/08. This will include design completion and commencement of construction	Project delayed by complexity of technical issues and stakeholder issues. Progress at the end of 2007/08 included the completion of detailed design and tender assessment. Overall project completion expected by 2012
Northern Diversion Sewer and Moonee Ponds Intercepting Sewer (i.e. Northern Sewerage Project - Stage 1)	80% of planned expenditure to be delivered by the end of 2007/08 with 12 months of construction activity remaining	Project start delayed due to significant additional community consultation resulting in delays in Government approvals. Construction commenced August 2007, progress currently 20% complete, with overall project completion by mid 2012

5.6 Changes in legislative and regulatory obligations

Since the Commission made its 2005 Price Determination, there have been several changes to the legislative and regulatory obligations that apply to Melbourne Water. New obligations have required additional operating expenditure of $12.9 million (as outlined in Section 5.3) and financing costs of $2.1 million on the additional capital expenditure invested over the 2005 regulatory period (as outlined in Section 5.2). Table 5.7 sets out the nature and date of these changes, the outcomes that Melbourne Water must now deliver and the associated net operating and financing costs that have been incurred over the 2005 regulatory period.

As indicated by the Commission, these changes will be taken into account in determining prices for the 2009 regulatory period where the net impact is 2.5% of a business's total revenue over the regulatory period, or $1 million, whichever is greater. Melbourne Water has not met the 2.5% revenue threshold of approximately $42.3 million, which equates to approximately 5% of Melbourne Water's allowed return on assets (profit) in the 2005 Water Plan. Melbourne Water notes that despite delivering the outcomes required by these new obligations, it will not be able to recover these additional operating and financing costs incurred within the regulatory period. Melbourne Water considers that 5% of its profit is material and that the threshold is too high. It considers that the current threshold does not appropriately allocate risks between itself and its users and also adversely impacts on returns to shareholders. This is discussed further in Chapter 6.

Table 5.7: Additional legislative and regulatory obligations for the 2005 regulatory period

Additional obligations	Instrument and date of effect	Outcomes to be delivered	Operating costs ($M)	Financing costs ($M)
Investigate identified alternative sources of supply to manage the water supply and demand balance	Statement of Obligations – clause 18 and 29 June 2007	Investigations to examine large scale alternative sources of water supply options identified in the CRSWS, including Eastern Water Recycling Project, stormwater recycling and seawater desalination.	8.7	0.0
To manage the water supply and demand balance, design and construct the Sugarloaf Pipeline linking the Melbourne supply system to the Goulburn River, contribute to the State Government's Food Bowl Modernisation project, and undertake design studies for the Victorian Desalination Project	Statement of Obligations – clause 18 and 29 June 2007	Consistent with the State Government's Water Plan, undertake design investigations, as well as necessary construction works, to ensure that the Sugarloaf Pipeline is in place by 2010 and the Victorian Desalination Project is operational by late 2011.	1.5	1.2
Reconnection of Tarago Reservoir to manage the water supply and demand balance	Statement of Obligations – clauses 18 and 29 June 2007	Bringing forward treatment plant upgrade works to ensure Tarago Reservoir is reconnected by 2009.	0.5	0.9
Manage and maintain non-operational assets	Statement of Obligations – clauses 14 and 15 June 2007	Undertake safety works at decommissioned Beaconsfield, Devilbend and Frankston reservoir sites.	0.3	0.0

Additional obligations	Instrument and date of effect	Outcomes to be delivered	Operating costs ($M)	Financing costs ($M)
Manage environmental flows in line with new established Bulk Water Entitlements	Water (Resource Management) Act 2005 – No. 99/2005 December 2005	Operate the water supply system in line with environmental requirements.	0.1	0.0
Amendment to Eastern Treatment Plant discharge licence	EPA Victoria, Works Approval – WA48124 August 2005	Report results of modelling the environmental effects of modifying effluent discharge flows.	0.5	0.0
Apply sustainable management principles to programs and activities to ensure the ongoing sustainability of resources	Statement of Obligations – clause 28 June 2007	Undertake investigations into options for renewable energy and energy efficiency, implement actions to maintain and restore natural assets of biodiversity significance	1.3	0.0
Total			**12.9**	**2.1**

Melbourne Water considers that the additional expenditure it has incurred in relation to these new obligations is efficient and reflects a least cost outcome.

As noted in section 5.2, Melbourne Water has processes in place to ensure that additional capital expenditure is prudent and efficient and is supported by a capital planning and delivery framework as well as an asset management system. It is also undertaking various actions to ensure that it continuously improves its processes around capital planning, estimation and delivery. Chapters 9 and 10 provide further detail.

5.7 Lessons for the 2009 regulatory period

Experience over the 2005 regulatory period has established that:

- Uncertainty is created by the current climatic conditions and changing legislative and regulatory obligations, which in turn increases the difficulty associated with accurately forecasting demands, capacities and capital and operating expenditures
- Improved information within the regulatory period can lead to changing cost estimates, reprioritisation of projects and additional projects being bought on line
- The Commission's current approach to assessing new obligations under a 2.5% revenue threshold can impact on a business's financial performance, as higher service standards or additional outcomes must be delivered but businesses are unable to reach the threshold and recover the associated costs
- It is realistic to expect that in the current environment, the above issues will continue in the 2009 regulatory period.

In the following chapter, Melbourne Water outlines its views in relation to the appropriate framework for economic regulation over the 2009 regulatory period. These views have been informed by the lessons learned during the 2005 regulatory period.

Chapter 6

Framework for industry regulation

Melbourne Water has used the working assumptions provided by the Minister for Water in preparing the 2009 Water Plan

Melbourne Water supports moving to a four year regulatory period. In doing so, the framework for economic regulation should provide sufficient mechanisms to enable water businesses to deal with the uncertainties and risks that may arise over the 2009 regulatory period.

Melbourne Water is proposing:

- A within-period review and pass through process for predetermined large but relatively uncertain projects
- An end-of-period pass through mechanism for the costs of meeting additional regulatory obligations arising during the 2009 regulatory period
- Price caps as the form of price control for water and sewerage prices, along with an annual assessment of demands to establish whether there are material variations with the estimates used by the Commission in its final decision and necessary adjustments to prices.

This chapter notes the working assumptions provided by the Minister for Water for preparing the 2009 Water Plan, as well as the further considerations these assumptions will require. It also sets out Melbourne Water's views in relation to the appropriate framework for economic regulation over the 2009 regulatory period. In principle, Melbourne Water supports a longer regulatory period of four years, provided that the Commission ensures there are appropriate review and adjustment mechanisms in place to deal with the significant degree of uncertainty surrounding the current operating environment. This chapter details the nature of the uncertainties facing Melbourne Water and the regulatory mechanisms Melbourne Water believes are necessary to manage these uncertainties. It also sets out Melbourne Water's views on the appropriate basis for assessing expenditure estimates.

In administering the regulatory framework, the Commission must, under the Water Industry Regulatory Order, approve prices, or the manner in which prices are to be determined, if it is satisfied that the prices were developed in accordance with the relevant procedural requirements and comply with the relevant regulatory principles. Importantly, the prices must:

- Provide for a sustainable revenue stream for the business
- Allow the business to recover its costs, including its operational and maintenance expenditures as well as its renewal expenditures
- Allow the business to recover a rate of return on its assets and costs associated with debt incurred to finance those assets
- Provide the business with incentives to pursue efficiency improvements and promote the sustainable use of Victoria's water resources
- Take into account the interests of customers and be readily understandable.

It is in this context that Melbourne Water has addressed the issues discussed in this chapter.

6.1 The State Government's pricing expectations

Melbourne Water has received written advice from the Minister for Water about the working assumptions it should use in preparing the 2009 Water Plan to ensure that consumers' average bills will approximately double (in real terms) by 2012. That is, Melbourne Water should:

- Adopt a four year regulatory period from 1 July 2009 to 30 June 2013
- Defer $135 million regulatory depreciation to the next regulatory period starting 1 July 2013[54]
- Transfer $300 million from Melbourne Water's Regulatory Asset Value to South East Water (63%) and City West Water (37%)[55]
- Not carry forward losses or adjustments from prior years to the 2009 regulatory period, with the exception of efficient capital expenditure that can be rolled forward into the Regulatory Asset Value
- Adopt a real post-tax Weighted Average Cost of Capital of 5.8%
- Propose efficient capital and operating expenditures.

[54] This has been done by deferring depreciation on 95% of Melbourne Water's capital expenditure over the 2009 regulatory period.

[55] This has been done by reducing Melbourne Water's actual closing Regulatory Asset Value for 2007/08. This closing value includes the actual capital expenditure for 2007/08 which was higher than the estimate in the Commission's 2005 Price Determination. The opening Regulatory Asset Value for the 2009 regulatory period is the closing Regulatory Asset Value for 2007/08, updated for 2008/09 capital expenditures and return on and of, to give the closing Regulatory Asset Value for 2008/09.

Melbourne Water has adopted these working assumptions, it also notes the following additional actions it has taken to manage its average annual price increase and therefore consumers' average annual bills:

- In both 2007 and 2008, it reviewed and reprioritised its capital expenditures, identifying particular projects that could be deferred. As a consequence, planning for the Western Treatment Plant salt reduction plant did not continue, the Ringwood South, Hawthorn Main and Kew North sewer upgrades were all deferred and the biosolids waste to energy project at the Western Treatment Plant was not included in capital expenditure forecasts due to project uncertainties
- It has not adjusted its capital expenditure estimates to take account of differences between forecast increases in construction cost and the consumer price index, which will require Melbourne Water to improve the efficiency of its capital delivery
- Operational efficiencies have been identified, for example the way the energy from Melbourne Water's mini-hydros is used by the business.

Melbourne Water also notes that following the Commission's review of the 2009 Water Plan, as well as those of the retail water businesses, and any further information presented to the Commission, the above working assumptions may be revised. For example, if the Weighted Average Cost of Capital is less than 5.8%, this would enable the Commission to review the other working assumptions and say, reduce the amount of Melbourne Water's Regulatory Asset Value that is transferred or the amount of depreciation deferred.

Melbourne Water has set out below some further issues that will need to be considered in relation to these assumptions in the event they are not revised.

6.1.1 Deferral of depreciation

Melbourne Water will likely be seeking a 'fixed principle' commitment from the Commission in the recovery of the specified amount of depreciation deferred in the 2009 regulatory period. In particular, a commitment to both the recovery of the specified amount in the regulatory period starting 1 July 2013 and that this will occur in a net present value neutral manner.

The fixed principle approach has been used by the Commission for gas distribution and provides it with the capacity to make legally binding commitments about the treatment of particular matters in future price reviews. For example, the treatment of efficiency carryovers and the methodology to be used to derive the rate of return. By making such commitments, businesses have greater certainty about the approach to be taken at the end of a regulatory period.

The Commission's September 2008 *Supplementary Guidance on Water Plans* proposes that businesses should not claim depreciation on major assets until the asset enters service and recognises that alternative depreciation methods may be used by the business. It notes that businesses should consider whether it may be more appropriate to adopt a depreciation profile that better matches asset utilisation and/or to smooth price paths across regulatory periods, either by shifting some regulatory depreciation to a future period or by adopting a depreciation profile other than straight line.

Melbourne Water notes the Commission's approach to aligning asset utilisation with the depreciation profile and claiming depreciation on major assets when the asset enters service. However, the working assumption that Melbourne Water should defer $135 million of regulatory depreciation means it is not recovering depreciation on 95% of its capital expenditure over the 2009 Water Plan period, irrespective of when the asset related to the expenditure comes into service.

The Commission also notes that other depreciation profiles may be used such as the annuities approach. This method attempts to align the depreciation profile with the use of the asset and is more applicable to renewals expenditure. This method is commonly used in the irrigation sector and is designed to smooth the depreciation profile over a period of time to align it to the average annual capital expenditure.

One of Melbourne Water's concerns in relation to the annuities approach is the tendency for renewals capital expenditure to fluctuate over time, particularly given the lumpy nature of the renewals projects which depend on the age of the assets (see Chapter 10). Further, it considers that it would be problematic to adopt multiple depreciation methods for different types of assets, e.g. having one method for major assets and another for renewals expenditure.

6.1.2 Transfer of Regulatory Asset Value

The working assumption to transfer $300 million of Melbourne Water's Regulatory Asset Value to South East Water and City West Water could raise issues for Melbourne Water in terms of asset impairment and debt transfer. While these are not issues dealt with by the regulatory framework, they impact on business performance from an accounting perspective and need to be taken into account.

Impairment is an accounting concept that will reduce the value of a business' assets where the historical cost of its assets exceeds the market value of those assets (i.e. the recoverable amount). It serves to ensure that the assets of a business are not overvalued or inflated. The revenue generated by the assets is generally used to establish market value. If asset impairment occurs, then the business may need to write down particular asset values, which increases its expenditure in the year of the write down, and lowers profit and dividend payments to the State Government. It will also impact on the balance sheet through lower asset values.

The transfer of $300 million of Melbourne Water's Regulatory Asset Value to the retail water businesses will reduce Melbourne Water's revenues and therefore affect the market value of assets under the impairment test. At this stage, it does not appear the transfer of Melbourne Water's Regulatory Asset Value will result in asset impairment. However, Melbourne Water considers that this issue should be further examined by the Commission in the context of the working assumptions being reviewed, and the finalisation of the contractual arrangements for the Victorian Desalination Project.

While the transfer of Melbourne Water's Regulatory Asset Value to South East Water and City West Water is proposed as a working assumption, the issue of corresponding debt transfers between the businesses is not addressed. To date, this has been viewed as a matter best considered by the Department of Treasury and Finance after the 2009 Water Plan process. Melbourne Water considers that these two matters should be considered in conjunction to ensure that regulatory decisions do not impact on the financial viability of the business.

Melbourne Water also notes that there may be other ways to achieve the pricing outcomes of the proposed transfer of Melbourne Water's Regulatory Asset Value.

6.2 Approach to managing risks and uncertainties

Chapters 4 and 5 outlined the unanticipated changes in Melbourne Water's operating environment since the Commission set prices in mid 2005. These included:

- Climate variability, the worsening drought and the introduction of tighter water restrictions which have reduced revenues, increased operating costs and brought forward capital expenditure
- New legislative and regulatory obligations, which have seen material increases in expenditure
- Higher than planned increases in some input costs.

As discussed in Chapter 4, Melbourne Water continues to review and improve its forecasting methodologies as new information becomes available. However, it is realistic to expect that there will be a significant level of uncertainty with respect to expenditures (particularly infrastructure related) and demands during the 2009 regulatory period.

Meaningful and achievable incentives for businesses to deliver improved performance to customers, as well as sound allocation, should be included in the design of the regulatory framework. This should include sound risk allocation as inappropriate risk allocation could lead to inefficient investment and resource use, and stifle innovation.

As the 2009 regulatory period will be set at four years, it will be particularly important to ensure there are sufficient mechanisms to enable water businesses to deal with any significant risks and uncertainties that may arise over that period. This includes risks and uncertainties around legislative and regulatory obligations, major capital projects and demands.

Melbourne Water considers it is important to distinguish between foreseeable risks and those risks and uncertainties which are essentially 'unknowns'. The principle of optimal risk allocation suggests that risks should be allocated to those parties who are best able to manage the risk and that, where the risk is unmanageable, it is allocated to those parties best able to absorb the risk.

In terms of uncertainties, the current climatic conditions and potential for ongoing drought are outside historical planning expectations. For example, in the 2006 calendar year the inflows to Melbourne's four major harvesting storages were 35% less than the long term average (1913 - 2006).

In response to these conditions the *Our Water Our Future: the Next Stage of the Government's Water Plan* (the State Government's Water Plan) identifies a range of system augmentations that will increase water security by diversifying and boosting water supplies. These augmentations are very large, complex projects, some of which have expenditure estimates that are still preliminary and uncertain. Melbourne Water considers that this expenditure uncertainty will not be fully manageable through the normal reprioritisation of projects and cost estimation approaches.

Chapter 6
Framework for industry regulation

In its March 2007 *Guidance Paper*, the Commission noted that, given the unprecedented severity of the drought, it would be reasonable for customers to bear some of the associated risks through increased prices during the regulatory period. It accepted that the regulatory framework should include adjustment mechanisms that deal with uncertainty around demand, predetermined major projects, as well as material changes or the introduction of legislative obligations during the regulatory period. The Commission also listed possible mechanisms for dealing with uncertainty:

- Re-opening of the determination triggered by particular materiality thresholds or triggers
- Predetermined pass throughs
- Forms of price control
- Mid period reviews.

In its September 2008 *Supplementary Guidance on Water Plans*, the Commission noted its approach for dealing with uncertain projects in the *2008 Price Review*. This included both within period and end of period adjustments. It also noted that 2009 Water Plans should clearly identify significant capital projects that are particularly uncertain in terms of cost or timing, and indicate whether expenditure has been included in the proposed prices.

Melbourne Water considers that in order to adequately manage uncertainty and ensure optimal risk allocation over the 2009 regulatory period, the regulatory framework needs to incorporate the following features:

- For specified major projects that are particularly uncertain, a within-period review and pass through process should be established to examine the costs of those projects for inclusion in relevant prices
- A cumulative, end-of-period, pass through mechanism for additional and new legislative or regulatory obligations that are unforeseen and which arise during the 2009 regulatory period. This would be symmetrical in application[56] and have a materiality threshold of 1% of revenues (currently at 2.5% of revenues).

In its September 2008 *Supplementary Guidance on Water Plans*, the Commission also noted that it intends to approve the hybrid form of price control that it put in place for the regional urban businesses. This combines price caps with scope for businesses to adjust their tariff strategies at the time of the annual price review. It noted that this flexible form of price control enables significant changes between forecast and actual volume to be corrected during the 2009 regulatory period. If consumption rises faster than expected, and businesses earned higher than expected revenues, then prices would rise by less in subsequent years. Conversely, if consumption did not rise as anticipated, then price increases would be greater.

To assist manage demand uncertainty over the 2009 regulatory period, Melbourne Water proposes to apply an approach that is consistent with that used by the Commission in its *2008 Water Price review*. In particular:

- Price caps would apply to Melbourne Water's water, sewerage and trade waste prices
- There would be an annual assessment of whether there are material variations between actual demands and the demand estimates used by the Commission in its final decision
- If there are material demand variations then prices will be adjusted at the annual price review to ensure that the revenue requirement specified in the Commission's final decision is recovered.

These potential regulatory mechanisms are further discussed below.

[56] That is, apply to increases and decreases in costs arising from additional and new legislative or regulatory obligations.

6.2.1 Major projects

Melbourne Water believes that the regulatory framework should include a within-period review and pass through process for specified major projects that are included in the 2009 Water Plan with preliminary expenditure estimates or which are currently being considered by regulatory agencies or the State Government. It should also apply to specific projects that are not included in the 2009 Water Plan as a result of major uncertainties.

In particular, the within-period review and pass through process should apply to:

- The Victorian Desalination Project announced as part of the State Government's Water Plan, which is being delivered by the Department of Sustainability and Environment and is currently the subject of a competitive tender process. The final expenditures are not expected to be known until completion of the tender process and execution of contracts for the project. Preliminary estimates[57] of payment obligations in relation to the Victorian Desalination Project under PPP arrangement are included in the proposed prices
- The Eastern Treatment Plant outfall extension, or advanced effluent treatment, which is subject to decision making processes by key stakeholders and therefore has significant expenditure uncertainties. Approximately $2 million of expenditures has been included in the prices for initial works associated with the outfall extension
- The biosolids energy recovery project at the Western Treatment Plant, which is the subject of ongoing commercial and technical considerations and has significant uncertainties. Expenditure estimates for this project have not been included in the proposed prices
- Any significant expenditure required to be undertaken in relation to additional drought response measures. Expenditure estimates for additional drought response contingencies have not been included in the proposed prices.

A within-period process for reviewing the project expenditure estimates will assist in ensuring that prices are cost reflective, that there is optimal risk allocation and that the financial viability of Melbourne Water is not compromised.

It is not proposed that other projects with significant costs, such as tertiary treatment at the Eastern Treatment Plant and the Northern Sewerage Project, be subject to a within-period review given they are at more advanced stages and subject to less uncertainty.

Overarching regulatory framework

The following features of the overarching regulatory framework are relevant in considering the use of a within-period review and pass through process:

- The *Water Industry Act 1994* provides that the Commission must aim to 'ensure that regulatory decision making and regulatory processes have regard to any differences between the operating environments of regulated entities'
- The Water Industry Regulatory Order provides that the Commission has discretion to approve prices, or a mechanism for adjusting prices within a regulatory period, provided the prices or mechanism meet the regulatory principles in the Water Industry Regulatory Order.[58] Specifically, the Water Industry Regulatory Order allows the Commission to approve prices, or the manner of calculating prices, provided that customers can readily understand the process or the manner in which they are charged.[59]

[57] Based on the Feasibility Study completed in June 2007.

[58] Water Industry Regulatory Order, clause 8.

[59] Water Industry Regulatory Order, clause 14(1)(a)(ix).

Melbourne Water considers that the Commission, in exercising its discretion, must balance competing objectives and interests in relation to protecting customers, minimising the administrative costs of making pricing adjustments, protecting business' financial viability and creating incentives for efficient investment and system operation.

Precedents

There are precedents for within-period review and pass through processes in utility sector regulation.

In regulating electricity and gas businesses, national and state regulators (the Australian Energy Markets Commission [AEMC][60] and Independent Pricing and Regulatory Tribunal [IPART] respectively) have adopted within-period pass through approaches to manage uncertainties associated with significant projects and events. Examples include:

- Treatment of proposals for augmentation to transmission capacity in the Newcastle-Sydney-Wollongong corridor driven by load growth
- Treatment of uncertainties related to changes in the New South Wales Government's policy on interval / time based metering
- Treatment of proposals for augmentation to transmission capacity in the Eyre Peninsula and Riverland region to meet the new South Australian Electricity Transmission Code reliability standards
- The 'fixed principle'[61] approach adopted by the Commission for regulating gas distribution businesses.

In considering the relevance of these precedents, Melbourne Water notes that its business has strong parallels with electricity transmission businesses. Both have capital intensive and lumpy expenditure profiles, long life cycles for infrastructure assets and integrated networks. This compares to the typically more predictable capital expenditure profile of electricity distribution businesses, although recently some Australian electricity distribution businesses have also been experiencing more lumpy expenditure profiles.

The approaches for electricity transmission in the National Electricity Rules (NER), and for electricity distribution as used by IPART, provide that significant uncertain 'contingent' projects are considered separately from the main ex-ante regulatory framework.[62]

The main elements of the NER approach for transmission are:

- The project must be linked to a unique investment driver
- The project must satisfy a materiality threshold[63]
- Where the threshold is not satisfied, it is at the regulator's discretion as to whether these projects will be considered
- Determination of the allowed investment occurs during the regulatory period once the probability of the project and expected costs become known with greater certainty but before the investment is committed

[60] The AEMC is the rule maker for the National Electricity Market and establishes the regulatory framework administered by the Australian Energy Regulator (AER). The roles undertaken by the AEMC and AER in regard to electricity transmission were formerly undertaken by the ACCC.

[61] As allowed under the National Gas Code.

[62] In the case of the IPART approach, this reflects the unusual lumpiness of expenditure experienced by the electricity distribution businesses.

[63] The threshold requires that the project value (revenue required to cover the project's depreciation and return on investment) be equal to or greater than 10% of the revenue required to cover depreciation and return on investment of all projects included in the calculation of the main ex ante capital expenditure allowed.

- Triggers are developed defining when the project can be brought forward for approval. The process then, in effect, becomes a mini determination, with the project costs reflected through increased prices. At the end of the period, the depreciated value of the actual investment in the contingent project is rolled into the regulatory asset base.

The within-period cost pass through mechanism adopted by IPART, for electricity distribution, applies to certain general events (for changes in certain taxation obligations and regulatory obligations) and specified events. The mechanism for specified events recognises that, for some events, it is difficult to assess the reasonableness of any cost estimates due to the uncertainty about whether they will occur and, if they do, exactly what will be the resulting changes and cost implications.

For this reason, it is considered more appropriate to deal with these costs as pass throughs, and given they are foreseen at the time of the determination, to not apply a materiality threshold.[64] Businesses are able to apply for cost pass through within 90 working days of the cost pass through event occurring. IPART approves a total amount that can be passed through, as well as a profile of recovery over the remainder of the regulatory period (prices are increased through the annual price approval process).

As noted earlier, the fixed principle approach for gas distribution provides the Commission with the capacity to make a legally binding commitment about the treatment of particular matters at future reviews. In the current context, the Commission could apply a modified version of this approach by making a commitment to assess the efficient costs of specified projects, within the regulatory period, and to make adjustments to prices accordingly.

Proposed within-period review and pass through process

Melbourne Water considers that, consistent with established regulatory practice noted above, the regulatory framework for the 2009 regulatory period should include a mechanism that enables the review and pass through of specific project costs within the period. These costs would be associated with the specified projects noted above that are either included in the 2009 Water Plan with preliminary expenditure estimates or which, at this stage, are considered too preliminary to be included in the 2009 Water Plan.

Melbourne Water's specific proposal is:

1. A within-period review and pass through process should be applied to the Victorian Desalination Project announced as part of the State Government's Water Plan, the Eastern Treatment Plant outfall extension, or advanced effluent treatment (where a decision is taken to proceed with either of these projects), the biosolids energy recovery project at the Western Treatment Plant if it goes ahead during the 2009 regulatory period and any significant drought response contingency expenditures

[64] The general cost pass through must meet a materiality threshold of 1% of the average annual smoothed revenue requirement over the regulatory period.

2. In order to minimise the administrative costs associated with reviewing these projects, a review should ideally be undertaken following completion of the tender process and execution of contracts for the Victorian Desalination Project, or when the planning and functional design stages of the projects are complete, when expenditure estimates will be known with greater certainty[65]
3. The pass through mechanism should be symmetrical in nature e.g. where expenditure estimates are higher than initially forecast then prices should increase and where they are lower prices should decrease
4. Given these projects and their magnitude a materiality threshold should not apply.

6.2.2 Additional obligations over the 2009 regulatory period

Melbourne Water believes that the current end-of-period pass through mechanism for additional legislative or regulatory obligations should remain, with the materiality threshold set at 1% of revenues over the regulatory period, instead of the current 2.5%.

Melbourne Water notes that the current 2.5% threshold of revenues over the regulatory period equates to approximately 5% of the Commission's allowed return on assets (profit) in the 2005 Water Plan. Melbourne Water believes that the current threshold places an unacceptable level of risk on it given experiences over the current regulatory period and the fact that it has limited ability to manage the introduction of new obligations.

As detailed in Chapter 5, the new obligations placed on Melbourne Water since the 2005 regulatory period total $15 million (operating expenditure and unfunded financing costs), which amounts to approximately 35% of the 2.5% materiality threshold. It also represents approximately 2% of Melbourne Water's return on assets allowed by the Commission in the 2005 Water Plan.

As a result of the additional expenditures associated with large scale water augmentations announced in the State Government's Water Plan, Melbourne Water will be more highly geared over the 2009 regulatory period than previously was the case. Therefore, further expenditure as a result of additional obligations, over which, in many cases, the business has little influence, may result in reduced returns to the shareholder.

[65] At this stage, it is anticipated that the tender process for the Victorian Desalination Project should be finalised by late 2009 and a decision in relation to the outfall and advanced treatment will likely made in 2009. It remains unclear when there will be greater certainty in relation to the estimates for the biosolids energy recovery project or any potential drought response contingencies.

6.2.3 Form of price controls

As noted above, to assist manage demand uncertainty over the 2009 regulatory period, Melbourne Water proposes to apply an approach that is consistent with the hybrid form of price control used by the Commission in its *2008 Water Price Review*. In particular that:

- Price caps would apply to Melbourne Water's water, sewerage and trade waste prices
- There would be an annual assessment of whether there are material variations between actual demands and the demand estimates used by the Commission in its final decision
- If there are material demand variations then prices will be adjusted at the annual price review to ensure that the revenue requirement specified in the Commission's final decision is recovered.

The demand outcomes over the 2005 regulatory period demonstrate why such an approach is necessary. As outlined in Chapter 5, water demands over the 2005 regulatory period and sewage volumes received at Melbourne Water's treatment plants were respectively 14.5% and 16.3% lower than reflected in the Commission's 2005 Price Determination. This translated into revenues being approximately 8.5% lower than allowed for.

Ongoing climate uncertainty, with inflows for the 2007/08 financial year being 11% less than the average over the last 11 years (1997/98 to 2007/08), mean that this could continue in the 2009 regulatory period.

Melbourne Water has a significant capital program to deliver over the 2009 regulatory period, including the new water augmentations detailed in the State Government's Water Plan. In this context, and noting it has already under recovered its allowed revenues during the 2005 regulatory period, revenue certainty for the business will be crucial. Further, Melbourne Water's already high gearing ratio (within Commission's benchmark), and low interest cover heighten the imperative for an annual assessment of demand variations and the potential to adjust prices at the annual price review.

While not pre-determining the likely outcomes of the annual demand and price review, where demands are lower than forecast, and further water conservation is required, the opportunity to revise variable prices will provide the ability to strengthen price signals.

6.3 Approach to assessing expenditures

This section discusses Melbourne Water's positions on:

- Provision of information on expenditure associated with new obligations
- The approach for assessing efficiency improvements
- Treatment of mini-hydros as 'regulated' expenditures.

6.3.1 Information on new obligations

In its September 2008 *Supplementary Guidance on Water Plans*, the Commission noted that expenditure associated with new obligations includes any operating expenditure associated with the introduction of new obligations imposed by the Government and regulators, or increased service standard levels required by customers, which take effect on 1 July 2009 or later. It has indicated that the intent of distinguishing between the costs associated with business as usual and new obligations is to transparently identify the additional costs associated with regulatory decisions that are expected to take effect over the 2009 regulatory period.

In its March 2007 *Guidance Paper* the Commission also indicated that the expenditure assessment process should be largely forward looking, with the focus on the outcomes to be delivered in the next regulatory period and the expenditure needed to deliver these outcomes, rather than revisiting the forecasts from the last review.

A supplementary approach is to identify obligations which came into effect within the 2005 regulatory period and which were not included in the 2005 Water Plan.

As noted in Chapter 5, there have been a significant number of new obligations since the commencement of the 2005 regulatory period, in particular obligations arising from the *Central Region Sustainable Water Strategy* and the State Government's Water Plan. These do not form a part of Melbourne Water's business as usual activities, for example payment obligations in relation to the Victorian Desalination Project, but will contribute to the price increase over the 2009 regulatory period.

Supplying information on the cost of new obligations occurring since 1 July 2005 and which were not included in the 2005 Water Plan:

- Provides stakeholders with greater transparency around the factors contributing to price rises in the 2009 regulatory period
- Provides transparency around future drivers of expenditure to the extent that expenditure in relation to these obligations is forecast to increase
- Provides a clearer basis to determine whether efficiency improvement assumptions can be reasonably applied (see next section).

Provision of information on expenditures related to obligations put in place subsequent to the 2005 Water Plan, is also consistent with the proposed technical review of capital and operating expenditures the Commission will undertake. As an example, the review of business as usual expenditures is typically commenced through a trend analysis of historical expenditures. In the case of obligations that have been imposed since 1 July 2005, little or no historical trend information will be available. The review of expenditures related to post 2005 obligations will have to be undertaken in a similar manner to the way in which post 2009 obligations are reviewed, that is with regard to prudence and efficiency. Therefore, Melbourne Water believes that it is appropriate to capture all new obligations, either post 1 July 2005 or 2009, in the same expenditure category.

In subsequent chapters, Melbourne Water has used this approach when referring to new obligations. That is, new obligations are those which came into effect within the 2005 regulatory period and which were not included in the 2005 Water Plan. At this stage, there are no new obligations which can reasonably be expected to take effect from 1 July 2009 (which is the Commission's approach to identifying new obligations).

6.3.2 Assessing efficiency improvements

Seeking efficiency improvements will continue to be an important part of the way in which Melbourne Water operates its business. However, the current operating environment, which holds greater uncertainty about demands, capital and operating expenditures, meeting stakeholder project delivery expectations, and shortages of skilled labour, increases the challenge associated with achieving ongoing material efficiency gains.

In Chapter 11, Melbourne Water has set out its proposed efficiency improvements for operating expenditure and provides detail as to why it considers such gains are realistic in the current operating environment. These efficiency improvements relate to business as usual expenditures and not the expenditures associated with new obligations.

The rationale for removing new obligations from efficiency considerations is that the operating expenditure associated with these obligations will, in the majority, be undertaken via contracting and the price will be struck at the most competitive industry rate available. The opportunity to derive material efficiencies from these services will only become available if the service or works are ongoing and at a time when the contract comes up for renewal.

In its September 2008 *Supplementary Guidance on Water Plans*, the Commission notes that it expects businesses to be able to demonstrate an average annual productivity improvement of 1% per annum on business as usual expenditure over the 2009 regulatory period. It also notes that the 2009 Water Plans should demonstrate how the business is achieving, or is unable to achieve, growth adjusted productivity gains in business as usual expenditure. While the Commission has not detailed how the productivity improvement of 1% per annum should be determined, Melbourne Water would have concerns if the Commission was to adopt the approach it used in the 2005 regulatory period. Under this approach, businesses were required to achieve a minimum of 1% per year productivity improvement on their growth adjusted business as usual expenditure over the regulatory period, where growth was based on volume growth for water and sewerage. Melbourne Water's concerns arise because:

- The Commission's definition of new obligations would imply that business as usual expenditure will incorporate expenditure to meet new obligations that occurred prior to 1 July 2009 and this will contribute to significant growth in business as usual expenditure

- Assessment of growth for water and sewerage, based solely on volumes, is not a reflective measure for Melbourne Water.

Melbourne Water proposes that the efficiency factor should be applied to business as usual costs, excluding new obligations coming into effect from 1 July 2005 that were not included in the 2005 Water Plan. Further, it proposes that growth in business as usual expenditure should be established by assessing specific operating expenditure resource inputs, such as labour and materials, and the different drivers of these expenditures.

Two different drivers have been identified as being relevant; growth in water and sewerage volumes, and growth in business as usual assets.[66] While there is only slight growth in water and sewerage volumes, business as usual assets are growing. As noted in Chapter 10, the increased trend in business as usual investment is largely due to major assets reaching the end of their useful life, including the Melbourne Main Sewer and the Preston to North Essendon, and North Essendon to Footscray, water mains, and steel tank floors at Yuroke, Sydenham, Cowies Hill and Dandenong North.

Table 6.1 sets out the various operating expenditure resource inputs, proposed drivers of growth and reasoning as to why these drivers are appropriate.

Table 6.1: Operating expenditure resource inputs and proposed drivers of growth

Resource input	Growth driver	Reasoning
Labour	Asset growth	Labour costs are largely driven by the increasing size of Melbourne Water's asset base – more people are required to plan, deliver and operate an increasing business as usual asset base
External Services	Asset growth	External service costs are largely driven by the increasing size of Melbourne Water's asset base – more services are required to maintain an increasing business as usual asset base
Materials	Volume growth	Materials costs are largely driven by the water volumes – more chemicals are required due to increasing water and sewerage volumes
Information Technology	Asset growth	Information Technology costs are largely driven by headcount and are therefore affected by the same driver as labour
Energy	Volume growth	Energy costs are largely driven by volumes – more energy for pumping is required due to increasing water and sewerage volumes
Fees and Charges	Asset growth	Fees and charges are largely driven by the increasing size of Melbourne Water's asset base
Transport	Asset growth	Transport costs, e.g. fleet services, are largely driven by headcount and are therefore affected by the same driver as labour
Other	Asset growth	Other costs are largely driven by the increasing size of Melbourne Water's asset base
Land Tax	Asset growth	Land tax costs are driven by the increasing size of Melbourne Water's asset base as additional land is acquired where required for further assets

[66] This is based on the Regulatory Asset Value associated with business as usual activities, i.e. it does not include the Regulatory Asset Value associated with new obligations coming into effect from 1 July 2005 which were not included in the 2005 Water Plan. It also includes the working assumption noted in section 6.1 in relation to the transfer of $300 million of Melbourne Water's Regulatory Asset Value.

Consistent with the Commission's advice in its March 2007 *Guidance Paper*, Melbourne Water has assumed the efficiency factor would be applied to business as usual expenditure as at the end of the 2005 regulatory period i.e. in 2007/08.

6.3.3 Treatment of mini-hydros as regulated expenditures

In 2008, Melbourne Water negotiated a new electricity agreement with AGL that enables the power generated by its mini-hydros to be transferred for use at other Melbourne Water sites for a small fee. This means that Melbourne Water is able to source its own hydro power at its various sites instead of purchasing grid power (which reflects the mix of mostly non-renewable generation supplying Victoria). This enables it to reduce its energy operating expenditures and allows more efficient operation of the water and sewerage systems (rather than the hydro power being sold into the grid and generating revenue).

Reflecting the opportunity provided by this agreement for operational efficiencies, Melbourne Water proposes that the Sugarloaf mini-hydro and the six other mini-hydros should be treated as part of Melbourne Water's 'regulated' business. This means that the capital and operating expenditures associated with these projects, along with the reduced energy operating expenditures they will derive for the business, will be included in Melbourne Water's proposed revenue requirement and price increases. Previously, the Thomson and Cardinia hydros, as well as the six mini-hydro projects, have been considered as part of Melbourne Water's 'unregulated' business. Their expenditures did not form a part of Melbourne Water's revenue requirement and any revenues were recognised as being part of Melbourne Water's un-regulated business.

The proposed treatment of the Sugarloaf and other mini-hydros as part of Melbourne Water's 'regulated' business is consistent with other operational approaches used by Melbourne Water that enable it to generate energy and reduce its operating expenditures. The biogas from the treatment processes at the Western Treatment Plant, used to generate energy for on-site use, is one example of such an approach.

At this stage, given the contractual arrangements associated with the Thomson and Cardinia hydros, it is not proposed to treat these as part of 'regulated' business. However, as these contracts end, (November 2009 and December 2013 respectively), opportunities to use their power, in the same way as the mini-hydros, will be explored providing the potential for them to also be treated as a part of 'regulated' business.

Chapter 7

Outcomes over the 2009 regulatory period

Melbourne Water is subject to a wide array of legislative and regulatory requirements and customer service obligations in delivering its water, sewerage and recycled water services.

Extensive consultation has been undertaken to ensure that regulatory, Government and customer service requirements over the 2009 regulatory period are clearly defined and that priorities are agreed upon.

Environmental and public health outcomes and customer service standards proposed to be delivered over the 2009 regulatory period are consistent with agreed obligations and requirements.

Significant new obligations have arisen since the Commission last set prices which require considerable investment.

These new obligations, set out in Melbourne Water's revised Statement of Obligations, *Our Water Our Future: The Next Stage of the Government's Water Plan* (the State Government's Water Plan) and the *Central Region Sustainable Water Strategy* (CRSWS), include major projects such as the Victorian Desalination Project and construction of the Sugarloaf Pipeline.

This chapter sets out the obligations and requirements that guide the proposed environmental and public health outcomes and customer service standards that should be delivered by Melbourne Water's regulated water, sewerage and recycled water services over the 2009 regulatory period. It also details where obligations and requirements are either business as usual or new obligations[67] and the main activities that will be undertaken to deliver these obligations and requirements. Consultation undertaken with customers and stakeholders is also outlined.

The framework underpinning Melbourne Water's 2009 regulatory period obligations is summarised in Chapter 3.

[67] As noted in Chapter 6, new obligations are defined as those which came into effect within the 2005 regulatory period and which were not included in the 2005 Water Plan.

Chapter 7
Outcomes over the
2009 regulatory period

7.1 Summary of key requirements

Table 7.1 provides a summary of the key Government, regulatory and customer service requirements and associated outcomes driving increases in Melbourne Water's proposed expenditures and prices over the 2009 regulatory period.

Further detail on each of the key requirements is included in the following sections of this chapter along with Appendix 1. The capital and operating costs associated with meeting the obligations and activities outlined in this chapter are discussed in Chapters 10 and 11 respectively.

Table 7.1 – Key requirements and outcomes over the 2009 regulatory period

Area	Regulatory instrument	Nature	Requirement	Outcome to be delivered
Water management	Statement of Obligations	New	Manage the water supply and demand balance to ensure demand can be met for a minimum of 7 years and develop a program of works or initiatives that is consistent with the CRSWS (and the State Government's Water Plan) to secure water supplies beyond 7 years	Secure additional water by the end of 2011 via the Victorian Desalination Project[68] Secure additional water by mid 2010 via construction of the Sugarloaf Pipeline and contributions to the Food Bowl Modernisation Project Bring Tarago Reservoir back on line by mid 2009
Water quality	Safe Drinking Water Act Bulk Water Supply Agreements	Business as usual	Supply water that complies with the requirements in the Safe Drinking Water Act and the Bulk Water Supply Agreements	Implement open catchment area works involving drinking water quality investigations Undertake Yarra Glen and Healesville disinfection by-product works
Sewage spills	State Environment Protection Policy (Waters of Victoria)	Business as usual	Hydraulic capacity of new sewers to contain flows associated with up to a one-in-five year rainfall event and existing sewers to be progressively upgraded to this standard	Progressively achieve 0 spills due to storm events of a severity of up to one-in-five years by completing stage 2 of Melbourne Water's Spills Abatement Program which includes the Northern Sewerage Project
	State Environment Protection Policy (Waters of Victoria)	Business as usual	Sewerage system be managed so that spills due to system failure do not occur	0 spills due to pump station failure or sewer failure through Melbourne Water's ongoing renewal and maintenance program which includes replacement of the Melbourne Main Sewer

[68] As previously noted, it has been assumed the Victorian Desalination Project will be delivered as a PPP and that service payments under the PPP arrangements will be operating expenditure for Melbourne Water.

Chapter 7
Outcomes over the 2009 regulatory period

Area	Regulatory instrument	Nature	Requirement	Outcome to be delivered
Sewerage treatment and disposal	EPA Victoria discharge licence State Environment Protection Policy EPA Victoria Works Approval Environment Protection Act 1970 Statement of Obligations	Business as usual	Ensure the program of works meets the requirements of the EPA Victoria licence, and the current Works Approval, for the Eastern Treatment Plant, to improve effluent quality and address marine discharge impacts at Boags Rocks and is consistent with the CRSWS (and State Government's Water Plan) to upgrade the treatment process at the Eastern Treatment Plant to achieve Class A recycled water standards to facilitate increased water recycling opportunities	Upgrade the Eastern Treatment Plant to tertiary standard by 2012
	EPA Victoria discharge licence	Business as usual	Comply with discharge licence performance limits for the Eastern Treatment Plant	Meet discharge licence requirements for the Eastern Treatment Plant including pre-treatment infrastructure renewal and odour reduction works
	EPA Victoria discharge licence	Business as usual	Comply with discharge licence performance limits for the Western Treatment Plant	Meet discharge licence requirements for the Western Treatment Plant including sludge processing and handling works, wet weather capacity upgrades and odour reduction works
Biosolids	EPA Victoria discharge licence	Business as usual	Maximise the reuse of biosolids	Biosolids reuse of 90,000 cubic metres at the Eastern Treatment Plant for construction fill by 2013 along with pursuing reuse opportunities for biosolids at the Western Treatment Plant
Recycled water	Statement of Obligations	New obligation	Potable substitution targets for greater Melbourne of a minimum of 6.2 GL per year by 2015	Contribute 964 ML per year of recycled water to the 6.2 GL potable substitution target by 2013
Sustainable management	Statement of Obligations	New obligation	Apply Sustainable Management Principles in performing its functions and develop and implement programs for assessing, monitoring and continuously improving its performance	Reduce greenhouse gas emissions by 40% of Melbourne Water's 2000/01 emissions by 2013 61% of total energy used or exported is from renewable sources by 2013

7.2 Customer and stakeholder consultation

Melbourne Water is subject to a wide array of legislative and regulatory requirements and customer service obligations in delivering its water, sewerage and recycled water services. The nature of legislation and government policies can often result in requirements being worded in terms that are open to interpretation.

To ensure that activities are aligned with customer, regulator and stakeholder expectations, Melbourne Water has undertaken considerable consultation to clearly define its requirements over the 2009 regulatory period. The consultation process has been informed by Melbourne Water's planning processes which aim to prioritise requirements and outcomes in order to optimise value for customers, the community and shareholders.

Outcomes and customer service standards included in the 2009 Water Plan have been set to ensure consistency with the requirements and priorities agreed as part of the consultation process.

Specific consultation undertaken with respect to clarifying Melbourne Water's obligations, requirements and outcomes over the 2009 regulatory period have included:

- Circulating templates to regulators for consultation and comment which detail obligations, outcomes, activities and expenditures for the 2009 regulatory period
- Regular meetings with regulators, customers and State Government on issues, options, proposed expenditures and potential price impacts
- Providing presentations, draft strategies and plans for review and comment
- Working with the retail water businesses and the Department of Sustainability and Environment in developing, revising and implementing the Metropolitan Reuse and Recycling Plans
- Discussions with the State Government, retail water businesses and other stakeholders to fulfil the obligations contained in the State Government's Water Plan and the CRSWS
- Meetings with the Department of Human Services and EPA Victoria on recycled water quality requirements.

Where obligations change or new obligations arise over the 2009 regulatory period, Melbourne Water will work with the State Government, regulators and customers to confirm relative priorities and the most appropriate source of funding, including use of the mechanisms provided in the regulatory framework to manage such change.

7.3 Water

Melbourne Water harvests, stores, treats and transfers water to meet State Government policies and strategies, while complying with EPA Victoria's environmental obligations, Department of Human Services' drinking water quality requirements and meeting customer service standards.

7.3.1 Overview of obligations and strategies

Formal requirements associated with Melbourne Water's water supply services are set out in a range of documents issued by the Department of Sustainability and Environment, the Department of Human Services and EPA Victoria.

Importantly, this includes the Statement of Obligations as well as the State Government's Water Plan and the CRSWS, which detail requirements to manage the water supply and demand balance through the delivery of large scale water augmentations. The Statement of Obligations also contains further requirements in relation to responding to drought, bushfire protection, dam safety, blue-green algal blooms and the Smart Water Fund.

Environmental and Bulk Water Entitlements also specify further requirements in relation to operating the headworks system to meet environmental flow requirements and minimise the impact on downstream waterways and aquatic biota, as well as flow metering.

The Safe Drinking Water Act 2004 and the *Health (Fluoridation) Act 1973* set out the water quality requirements that Melbourne Water must meet to provide safe drinking water.

Service standards agreed with the retail water businesses are set out in the Bulk Water Supply Agreements.

7.3.2 Statement of obligations

Water management

There are several requirements under Melbourne Water's Statement of Obligations in relation to water demand and supply management. In particular, there are obligations relating to the management and conservation of water.

Significant effort has been undertaken in developing strategies that support these requirements since the 2005 Price Determination and these are outlined in the following documents:

- The State Government's Water Plan
- The CRSWS
- The Water Supply and Demand Strategy for Melbourne 2005-2055
- The Metropolitan Reuse and Recycling Plans.

These set out the industry-wide approach to water management over the short and long term, as well as detailing the specific actions that need to be undertaken over the 2009 regulatory period.

Chapter 7
Outcomes over the 2009 regulatory period

Under the Statement of Obligations, Melbourne Water has the following new obligations:

- Manage its demand and supply balance to ensure it can meet demand for a minimum of seven years and develop a program of works or initiatives to secure water supplies beyond seven years
- Ensure that the program of works or initiatives is consistent with any State Government sustainable water strategy and subject to customer consultation on the costs and benefits of different demand management and supply initiatives
- Develop, by 31 March 2007 and each five years thereafter, a joint Water Supply and Demand Strategy to identify the best mix of demand measures and supply options for its urban supply systems. The strategy should include water conservation targets.

Business as usual obligations under the Statement of Obligations include:

- Implementing sustainable water resource management programs which are consistent with Metropolitan Joint Water Conservation Plan
- Assess and monitor available water supplies
- Reduce leakage and minimise other losses of water from its works to an economically sustainable level.

2009 Water Plan outcome
Implement a program of works, that is consistent with the CRSWS and State Government's Water Plan, to ensure that demand can be met for a minimum of seven years.
Contribute Melbourne Water's component towards the State Government's water conservation target to reduce average water use by 15 per cent by 2010. Of the 15 per cent, Melbourne Water's component is 3.7% by 2010.
Maintain system losses to less than 1% of water supplied to retail water businesses.

New activities required to deliver the water management obligations and outcomes are:

- Bring Tarago Reservoir back on line, by constructing the Tarago Treatment Plant by mid 2009
- Design and build the Sugarloaf Pipeline by mid 2010 and secure the water rights through a contribution to the Food Bowl Modernisation project
- Payment obligations in relation to the Victorian Desalination Project, expected to be delivered by the end of 2011.

In relation to its existing obligations and outcomes, Melbourne Water will also continue to undertake aqueducts works, including lining replacement for integrity and leak control, as well as a program for reducing leakage and minimising other losses in the transfer pipelines. The system loss outcome has been revised for the 2009 regulatory period to reflect the accuracy of the estimate and the annual variation in the volume of water supplied.

Responding to drought

Under its Statement of Obligations, Melbourne Water must cooperate with and assist each of the retail water business in reviewing its Drought Response Plan, in accordance with the Drought Response Protocol. This is a business as usual obligation.

As discussed in Chapter 4, the context in which this obligation needs to be met has changed significantly. During the 2005 regulatory period, Melbourne Water participated in the Victorian Water Industry Association Water Restriction Working Group, which developed the Victorian Uniform Drought Water Restriction Guidelines. Following the development of these guidelines, Melbourne Water, in consultation with the Department of Sustainability and Environment, also cooperated with and assisted the retail water businesses to review and develop their Drought Response Plans. The four-stage water restrictions policy was adopted in the retail water businesses' Drought Response Plan in June 2006.

2009 Water Plan outcome

Continue to assist the retail water businesses with drought response activities and the review of the Drought Response Plan that facilitates timely and co-ordinated responses to severe drought conditions.

To deliver the existing drought response obligations and outcomes, Melbourne Water will review and contribute to the maintenance of the Drought Response Plan in consultation with the retail water businesses and the Department of Sustainability and Environment.

Melbourne Water will also continue with ongoing operational measures to meet the challenges of the drought and to maximise storage levels in Melbourne's reservoirs. Measures to achieve these aims include changed management of Thomson releases, changed operation of pumps at Sugarloaf Reservoir to enable harvesting of smaller volumes during drought, increased harvesting of Yarra tributaries to capture water during storm events, increased pipe repairs and the use of Swingler Weir.

Bushfire protection in water catchments

Under its Statement of Obligations, Melbourne Water must manage risk to protect public safety, quality and security of supply. It must also develop and implement plans, systems and processes to ensure risks to Melbourne Water's assets are identified, assessed and managed. In this regard, comprehensive bushfire protection in the water catchments is a critical initiative to maintain water quality and security of supply. A severe bushfire would have an immediate effect on water quality and adverse long-term impacts on water yield. This is a business as usual obligation.

2009 Water Plan outcome

Minimise the potential impact of bushfires on the water supply catchments.

To meet bushfire protection obligations over the regulatory period, Melbourne Water will undertake a program of bushfire management works and activities including:

- Fire prevention and suppression works, such as developing further permanent fire breaks and undertaking fire reduction burns
- Improving access for fire fighting and fire breaks
- Improving technology in fire towers

- Undertaking research into the incidence and likelihood of bushfires, as well as those areas within Melbourne Water's catchments where suppression and rehabilitation activities would provide the most benefit. This includes examining the feasibility and cost/benefit of large scale infrastructure projects that would address the risks associated with bushfires in catchments
- Execute the Partnership Agreement between Melbourne Water, the Department of Sustainability and Environment and the Country Fire Authority of Victoria in order to establish protocols for joint fire protection operations in catchment areas
- Continue implementing comprehensive fire protection plans for each catchment developed in consultation with the Department of Sustainability and Environment, Country Fire Authority of Victoria, local governments and community.

Dam safety

Under its Statement of Obligations, Melbourne Water is required to develop and implement processes to maintain the safety of its large dams, having regard to the Australian National Committee on Large Dams (ANCOLD) guidelines. This is a business as usual obligation.

2009 Water Plan outcome

Melbourne Water will maintain the safety of its dams having regard to ANCOLD guidelines.

To meet existing dam safety obligations and outcomes over the regulatory period, Melbourne Water will:

- Transition its dam risk assessment program from a standards based approach to a risk based approach
- Remediate the Toorourrong Reservoir embankment and spillway
- Undertake seepage monitoring improvements at Upper Yarra Reservoir.

Blue-green algal blooms

Under its Statement of Obligations, Melbourne Water must report any blue-green algal blooms impacting on water supply services to the Department of Human Services, the relevant Convening Agency (which is Melbourne Water) and licencees. As a Convening Agency, Melbourne Water is required to develop and maintain a contingency plan for regional blue-green algal blooms and undertake its duties as a Convening Agency in accordance with the contingency plan. Under the State Environment Protection Policy (Waters of Victoria), Melbourne Water must ensure the water supply system is free of any substance (such as blue-green algal blooms) that would pose a risk to beneficial uses. These are business as usual obligations.

2009 Water Plan outcome

Report on any blue-green algal blooms impacting on water supply services to relevant parties and maintain a contingency plan.

To meet these obligations over the regulatory period, Melbourne Water will continue to:

- Monitor blue-green algal blooms and report any blooms to relevant parties
- Maintain a contingency plan for regional algal blooms and undertake its duties as Convening Agency in accordance with the contingency plan.

Smart Water Fund

Under its Statement of Obligations, Melbourne Water must participate in and contribute funds to the Smart Water Fund. This is a business as usual obligation.

2009 Water Plan outcome
Encourage and support innovative development of water saving projects within the community.

Melbourne Water will participate in and contribute funds to the Smart Water Fund. In the 2009 regulatory period provision has been made to fund all rounds up to and including round six of the Smart Water Fund. It is currently being determined whether the Smart Water Fund will proceed beyond round six and should a decision to proceed occur, Melbourne Water will need to revise its operating expenditure estimates.

7.3.3 Environmental obligations

Environmental flows

Melbourne Water takes water from streams in the Thomson, Yarra, Bunyip and Goulburn River Basins to supply the retail water businesses and allow licensed water users (river diverters) their allocations when available. As the storage operator for the Melbourne headworks system, it must operate the system to ensure that the water harvested from these river basins and released from storages complies with the environmental flow regime specified in the respective Environmental Entitlements. This is essentially a business as usual obligation, although it is formalised through new regulatory instruments and there are some new requirements. The new requirements relate to the release of environmental water held in storage to meet environmental flows in the Yarra River.

2009 Water Plan outcome
Melbourne Water will operate the headworks system to meet the Environmental Entitlement flow requirements.

To meet these obligations over the regulatory period, Melbourne Water will develop, implement and maintain Environmental Flow Operating Arrangements, an Annual Operating Plan and Storage Management Rules for the purpose of operating the headworks system to meet the flow requirements of the Environmental Entitlements.

Management of environmental effects

Under the Storage Operator Instrument of Appointment, issued by the Minister for Water under the *Water Act 1989*, Melbourne Water must manage the environmental effects of operating the headworks system and in particular the impact on the downstream waterway and the aquatic biota. This is a business as usual obligation in relation to the Thomson Reservoir and a new obligation in relation to the remainder of the Melbourne's reservoirs.

Under the Statement of Obligations, Melbourne Water must manage the impact of its activities on any waterway, aquifer or wetland to minimise environmental impacts on and risks to the aquatic ecosystem. This is a business as usual obligation in relation to waterways and wetlands and a new obligation in relation to aquifers.

2009 Water Plan outcome

Operate the headworks system in a way to manage impacts on waterways, aquifers or wetlands.

To meet its obligation over the regulatory period, Melbourne Water has developed and implemented an Environmental Management Program for the Melbourne headworks system to assess and manage the environmental effects of operating the weirs, pumps and harvesting storages.

7.3.4 Bulk entitlement obligations

Flow metering under the Bulk Entitlements

Under the Storage Operator Instrument of Appointment, Melbourne Water must measure and record flows into the headworks or waterways, releases/transfers from the headworks, and flows in the waterway at specified locations. It must also provide flow measurement data and reporting information to the holders of the Bulk Entitlements. This is a business as usual obligation in relation to the Thomson Reservoir and a new obligation in relation to the remainder of Melbourne's reservoirs.

2009 Water Plan outcome

Ensure flows are metered in the headworks system and waterways to show compliance with entitlements as required and reported to the holders of the Bulk Entitlements.

To meet flow metering obligations for the entire headworks system over the regulatory period, Melbourne Water will:

- Develop system-wide metering plans to demonstrate compliance with entitlements
- Where required, install new metering equipment and upgrade existing equipment
- Arrange periodic independent audits of metering activities.

Management of the Bulk Entitlements

As the headworks storage operator under the Storage Operator Instrument of Appointment, Melbourne Water is required to:

- Plan, manage and operate the headworks system and the bulk transfer system to meet the obligations under the Bulk Water Supply Agreements and Bulk Entitlements
- Manage releases from storages to meet downstream flow requirements.

As the resource manager for entitlements in the Yarra and Maribyrnong River Basins and potentially the Bunyip River Basin, Melbourne Water is required to monitor and report on compliance with Bulk Entitlements.

2009 Water Plan outcome

Manage the headworks system to meet obligations under the Bulk Entitlements and monitor and report on compliance with Bulk Entitlements.

To meet the Bulk Entitlement obligations over the regulatory period, Melbourne Water will:

- Develop, implement and maintain Environmental Flow Operating Arrangements, an Annual Operating Plan and Storage Management Rules for the purpose of operating the headworks system
- Report monthly and annually to the retail water businesses on operations against the Annual Operating Plan
- Arrange an annual independent audit of the operation of the headworks system
- Develop and implement a method to assess compliance with Bulk Entitlement diversion limits and establish improvements to the Bulk Entitlement arrangements in co-operation with retail water businesses
- Prepare Basin Accounts for the Yarra and Maribyrnong River Basins, and potentially the Bunyip River Basin, report compliance against Bulk Entitlements and co-ordinate application and implementation of qualification of rights to water made by the Minister during a declared water shortage.

7.3.5 Water quality obligations

The *Safe Drinking Water Act 2004* requires water authorities to develop and implement an integrated risk management framework for drinking water quality, comply with standards for water quality, communicate effectively with all stakeholders and publicly disclose relevant water quality information.

The *Safe Drinking Water Act 2004* provides for drinking water standards and detailed risk management requirements to be set through regulations. The *Safe Drinking Water Regulations 2005* specify requirements relating to a number of parameters relevant to public health and aesthetic considerations. These parameters are *E.coli*, trihalomethanes, chloroacetic acids, turbidity and aluminium.

Under the *Health (Fluoridation) Act 1973*, Melbourne Water is responsible for fluoridating water supplies to Melbourne and for monitoring and reporting results to the Department of Human Services.

These are all business as usual obligations.

2009 Water Plan outcome

Provide water that complies with the *Safe Drinking Water Act 2004* and the *Health (Fluoridation) Act 1973* requirements.

To meet the requirements of the *Safe Drinking Water Act 2004* and the *Health (Fluoridation) Act 1973* (as well as the customer service standards set out in the Bulk Water Supply Agreements, see section 7.3.6), Melbourne Water will:

- Implement open catchment area works involving drinking water quality investigations that include development of planning scheme controls, as well as a monitoring regime with a view in the longer term, over subsequent Water Plans, to undertake any necessary capital works such as the piping of aqueducts[69]
- Undertake Yarra Glen and Healesville disinfection by-product works (this also assists in delivering water quality outcomes required under the Bulk Water Supply Agreements)

[69] The drinking water quality investigations planned for 2009 regulatory period have been developed in conjunction with the retail water businesses' investigations plans and represents a catchment to tap risk management approach supported by Melbourne Water's stakeholders.

- Maintain its integrated risk management system for drinking water quality, which includes undertaking health related projects flowing from the strategies that support the Drinking Water Strategic Framework
- Continue monitoring and reporting of drinking water quality
- Contribute to the funding of the water quality regulator (Department of Human Services), as required by the State Government
- Undertake the necessary fluoridation and chlorination works associated with water supplied from the Tarago treatment plant and the Sugarloaf Pipeline.

7.3.6 Service standards

Core service standards

The service requirements of Melbourne Water's customers are set out in detailed, commercially negotiated supply agreements. The aim of these Bulk Water Supply Agreements is to clearly assign rights, obligations and risks in a vertically disaggregated industry to facilitate efficient and effective compliance with regulatory requirements. To this end, the agreements contain performance standards relating to pressure, water quality and drought security that reflect both customer requirements on Melbourne Water and retail water business obligations.

With regard to performance standards, in its March 2007 *Guidance on Water Plans*, the Commission noted that targets should be based on the three most recent years of data. It also noted that if some data is unreliable or inappropriate then businesses will need to use their judgement in setting targets and explain the reasons for any variation. The Commission also accepted that there is scope to further align Melbourne Water's core set of service targets with those in Bulk Water Supply Agreements.

Melbourne Water and the retail water businesses have reviewed the performance standards under the Bulk Water Supply Agreements and changes were identified for water quality. The changes involve moving away from measuring outcomes on a sample basis to a site basis.

The proposed standards are also based on the 12 months of data for 2006/07 as this is the most representative year for setting the historically based standards for water quality considering the current drought conditions. It is considered that water quality performance for 2007/08 is not representative for the purposes of setting standards because of the adverse impacts of an unprecedented storm event in the Upper Yarra catchment.

Melbourne Water will provide information on its recent performance to assist the Commission's assessment.

Pressure

The Bulk Water Supply Agreements require Melbourne Water to maintain specified pressures at monitoring points in the water supply zones, provided the retail water businesses do not exceed flow allocation limits. This is a business as usual obligation.

2009 Water Plan outcome

Achieve 99.6% compliance with the retail water businesses' pressure requirements, which are set out in Schedule 1 of the Bulk Water Supply Agreements.

Melbourne Water has developed a Capital Plan for the transfer system, in consultation with the retail water businesses, to ensure that agreed pressure standards are maintained as peak water demands increase with urban growth. This includes construction of the Preston-North Essendon water main, replacement of stage 5 and 6 of the Morang outlet main and floor replacement and upgrades for tanks at Sydenham, Yuroke, Cowies Hill and Dandenong North.

Water quality

The Bulk Water Supply Agreements require Melbourne Water to supply water of a specified quality at specified points in the water supply system and to take certain actions in relation to treatment processes at primary disinfection plants. This is a business as usual obligation.

2009 Water Plan outcome

Achieve:

- 100% compliance with microbiological standards *(E.coli)*
- 100% compliance with disinfection by-products (trihalomethanes and chloroacetic acids) standards
- 91.5% compliance with the aesthetic water standard for turbidity
- 100% compliance with the aesthetic water standard for aluminium.

as specified in the Bulk Water Supply Agreements.

In order to deliver water quality outcomes over the regulatory period, Melbourne Water will:

- Undertake Yarra Glen and Healesville disinfection by-product works
- Maintain its integrated risk management system for drinking water quality, which includes undertaking water aesthetic related projects flowing from the strategies that support the Drinking Water Strategic Framework (e.g. catchment management initiatives to reduce sediment and nutrient inputs to the water supply, thereby improving water aesthetics at source). Further, improving reservoir management through hydrodynamic and algal research will reduce the likelihood of algal events that impact on aesthetic water quality.

Supply security

The Bulk Water Supply Agreements require that Melbourne Water aims to operate its water supply system to provide security from drought so that:

- The probability of water restrictions being imposed is never greater than 5%
- Water restrictions are never imposed for more than 12 continuous months
- Water restrictions never exceed Level 3 restrictions.

This is a business as usual obligation.

As noted in section 7.3.2, under the Statement of Obligations, and the underlying strategies relating to water management, Melbourne Water must now manage its demand and supply balance to ensure it can meet demand for a minimum of seven years and develop a program of works to secure water supplies beyond seven years. This is a new obligation and assists in meeting the above security of supply requirements.

2009 Water Plan outcome

Melbourne Water will aim to provide the level of supply security currently specified in the Bulk Water Supply Agreements. It will also ensure that demand can be met for a minimum of seven years by implementing the State Government's Water Plan and the CRSWS.

In order to deliver the existing and new security of supply obligations and outcomes over the regulatory period, Melbourne Water will implement:

- Those activities detailed above in section 7.3.2 to assist in managing and conserving water, including payment obligations in relation to the Victorian Desalination Project, constructing the Sugarloaf Pipeline and bringing Tarago Reservoir back on line
- Those operational measures detailed above in section 7.3.2 to meet the challenges of drought and maximise storage levels in Melbourne's supply system.

7.3.7 Customer and stakeholder consultation

As a result of consultation and ongoing processes of engagement, Melbourne Water understands that, at this stage, its customers, regulators and stakeholders have no significant outstanding issues. Melbourne Water, therefore, believes that in the main the obligations and requirements detailed above are appropriate, as are the outcomes and activities proposed to achieve these obligations.

7.4 Sewerage

Melbourne Water transfers, treats and discharges sewage in compliance with EPA Victoria's environmental obligations and provides services that are environmentally sustainable and responsive to State Government, regulator, customer and community priorities.

7.4.1 Overview of obligations and strategies

Formal requirements associated with Melbourne Water's sewerage services are set out in a range of regulatory documents issued by the State Government and EPA Victoria.

Importantly, in 2007, EPA Victoria issued guiding principles to establish environmental obligations for water businesses for the next regulatory period. These recognise that EPA Victoria requirements are largely outcome based and provide flexibility in terms of how environmental issues are managed. Further, EPA Victoria, through its guiding principles, recognises that policies are generally developed with goals and attainment programs to be delivered over a given period of time, such as 5-10 years. In relation to principles of improved valuation, pricing and incentive mechanisms, it notes that the polluter pays principle should apply to trade waste prices and EPA Victoria licence fees for discharges to the environment.

Service standards agreed with the retail water businesses are set out in the Bulk Sewage Transfer, Treatment and Disposal Agreements.

The Metropolitan Sewerage Strategy is a joint initiative of the metropolitan water businesses, including Melbourne Water, which assists with meeting these legislative, regulatory and customer service requirements to ensure economies of scale and scope are captured and that there is a net community benefit. As well as examining shorter term priority issues, the strategy also focuses on longer term planning work to establish scenarios that could drive existing or planned sewage management in new directions. The draft strategy is scheduled to be produced by May 2009, and the final strategy by September 2009.

Melbourne Water has also developed an Annual Operating Plan for sewerage operations, including transfer and treatment. This provides a broad framework for the operation of the sewerage system for the five years from 2007/08, including key operating objectives and constraints, broad operating settings for key assets and forecasts of the key inputs and outputs of the system.

7.4.2 Environmental obligations

Applying the Waste Hierarchy for Sewage Management

The *Environment Protection Act 1970* and State Environment Protection Policy (Waters of Victoria) require all sewage treatment facilities to implement the waste hierarchy.[70] This is a business as usual obligation.

2009 Water Plan outcome

Melbourne Water is committed to working with retail water businesses to minimise retail customer discharges, to increase recycling of effluent and biosolids and to minimise effluent discharges to the environment. This is reflected in outcomes proposed below.

The waste hierarchy is included as part of Melbourne Water's Environment Policy and Environment and Public Health Management System. Consideration of the waste hierarchy will continue to be a guiding influence in the sewage outcomes proposed to be delivered by Melbourne Water over the 2009 regulatory period.

Trade waste

Under the State Environment Protection Policy (Waters of Victoria), Melbourne Water has a joint obligation with the retail water businesses to work with EPA Victoria and the Department of Sustainability and Environment to improve the management of trade waste and to minimise the impact of wastewater on beneficial uses. Additionally, the EPA Victoria discharge licences, the Statement of Obligations and the Bulk Sewage Transfer, Treatment and Disposal Agreements, require Melbourne Water to develop policies and practices to manage trade waste. These policies and practices aim to minimise environmental impacts, improve the quality of trade waste entering the sewerage systems and be guided by the EPA Victoria's waste hierarchy principle. For example, as part of its discharge licence requirements at the Western Treatment Plant, Melbourne Water must put in place policies and practices by 2009 to ensure that the concentration of salt in the untreated sewage it receives does not exceed a median concentration of 1,000 milligrams per litre. These are business as usual obligations.

The Future Directions statement arising from the State Government's Trade Waste Review should provide additional policy guidance to water businesses on sustainable trade waste management. Recognising the time that the review has taken to date, it was recommended in the State Government's response to the Victorian Competition and Efficiency Commission's final report for the *Inquiry into Reform of the Metropolitan Retail Water Sector* that the review be completed within twelve months. The Future Directions statement is planned for release in late 2008 and may result in new obligations for Melbourne Water.

2009 Water Plan outcome

Over the 2009 regulatory period, Melbourne Water will work with the retail water businesses to identify and implement effective and efficient policies and practices for improving trade waste management.

[70] The waste hierarchy requires that all practical options to avoid the generation of waste should be pursued. Recycling and reuse of the remaining sewage should be the next highest priority and where all practicable recycling and reuse options have been implemented, then disposal to the environment consistent with an EPA Victoria discharge licence is appropriate.

Chapter 7
Outcomes over the 2009 regulatory period

In order to deliver the 2009 Water Plan outcomes over the regulatory period, Melbourne Water will undertake the following initiatives in conjunction with the retail water businesses:

- Continue to develop Contaminant Management Plans for critical pollutants that constrain the beneficial reuse of recycled effluent and biosolids and where relevant, undertake actions to implement these plans. This includes continuing to implement investigations and initiatives under the Joint Salt Reduction Strategy for the Western Treatment Plant and investigating options for reducing sources of colour in sewage inflows to the Eastern Treatment Plant
- Continue to provide funding support for cleaner production partnership programs through EPA Victoria
- Continue to develop and implement a Hazard Analysis and Critical Control Point (HACCP) based preventative Risk Management System certified to ISO 22000 for sewerage quality management in metropolitan Melbourne
- Implement any activities necessary to achieve the outcomes from the State Government's Trade Waste Review. Melbourne Water considers that any additional costs associated with new obligations would be subject to the end of period pass through mechanism noted in Chapter 6 (see section 6.2.2).

Sewage spills

The State Environment Protection Policy (Waters of Victoria) sets out the hydraulic capacity requirements for the sewerage system. In particular, it requires sewers to contain flows associated with up to a one-in-five year rainfall event or a comparable design standard that avoids losses of sewage. It also requires that the sewerage system be managed so that spills due to system failure do not occur. This is a business as usual obligation.

2009 Water Plan outcome
System failure: Zero spills due to pump station failure or sewer failure including rising mains.
Hydraulic deficiency: Progressively achieve zero spills due to storm events of a severity of up to one-in-five years.

In 2007, a review was undertaken in relation to Melbourne Water's sewerage management systems, specifically relating to Melbourne Water's sewerage system upstream of the sewage treatment plants. EPA Victoria required that this review be undertaken prior to submission of the 2009 Water Plan and that it include any additional management actions identified from the review in the 2009 Water Plan.[71] Melbourne Water has provided the outcomes from the review to EPA Victoria and is implementing further investigations to identify any additional environmental risks from the sewerage system upstream of the sewerage treatment plants.

Melbourne Water will continue to implement a program of works to progressively meet the State Environment Protection Policy (Waters of Victoria) hydraulic capacity requirements. In particular, it will deliver the Northern Sewerage Project to minimise wet weather sewage spills in the Northern Suburbs, which do not meet the one-in-five year rainfall event standard.

[71] See *Principles to Establish EPA Environmental Obligations for Water Businesses for the 2008-12 Pricing Determination*, EPA Victoria, publication number 1069, November 2006.

As part of the ongoing renewal and maintenance program, Melbourne Water will also undertake works necessary to avoid system failures, including replacement of the Melbourne Main Sewer and the Werribee River aqueduct as well as rehabilitation of the Merri Creek and Carlton Main Sewers and commencement of the North Yarra Main Sewer duplication.

Until the program of works to meet the hydraulic capacity of up to a one-in-five year requirement has been completed, a return to normal weather conditions may result in wet weather spills that do not meet the State Environment Protection Policy (Waters of Victoria) due to existing hydraulic deficiencies in the system.

Sewerage treatment and disposal

Both of Melbourne Water's sewerage treatment plants discharge treated effluent to the environment consistent with discharge licences issued by EPA Victoria. Performance limits for both plants are set out in their respective discharge licences.[72] These are business as usual obligations.

In addition, under the State Government's Water Plan, the CRSWS and the Statement of Obligations, which requires Melbourne Water to ensure its program of works are consistent with any State Government sustainable water strategy, the Eastern Treatment Plant is to be upgraded to treat effluent to Class A recycled water standard by 2012. This requirement is also consistent with EPA Victoria Works Approval to address impacts associated with discharges to the marine environment. The outcome of the tertiary upgrade is to improve Eastern Treatment Plant's environmental performance and facilitate increased beneficial use of treated water in the future.

In 2007, a facility was constructed at the Eastern Treatment Plant to trial tertiary treatment technologies for a twelve-month period with formal trials commencing in February 2008. This is the first stage and a vital part of the design and implementation of the plant's major upgrade to tertiary treatment.

The trials will enable Melbourne Water to examine a range of treatment technologies and will help determine the most efficient treatment method to progress further to construction. The trials will also help to accurately design the works and refine the cost of the upgrade. An advanced colour and odour reduction process may also be incorporated in the tertiary upgrade to address residual aesthetic concerns associated with discharges. While the advanced treatment is focussed on addressing residual effluent compliance concerns at the existing Eastern Treatment Plant outfall such as colour and odour, it also offers other benefits for producing Class A recycled water. The opportunity to implement the tertiary and advanced treatment processes in a combined way could offer the most efficient and cost-effective approach to achieving the regulatory requirements.

Melbourne Water will work closely with key stakeholders to ensure the most effective process is chosen for full scale delivery, using the results from the trials. A final decision on the preferred process is expected in 2009 which will include consideration of whether to retain the shoreline discharge at Boags Rocks or extend the existing Eastern Treatment Plant outfall.

[72] Each licence also defines requirements for odour containment and environmental monitoring, recording and reporting. Maximisation of water and biosolids recycling and development of an Environment Improvement Plan are also required.

Melbourne Water proposes that where a decision is taken to proceed with either the Eastern Treatment Plant outfall extension, or advanced effluent treatment projects, any material costs would be subject to the within period review and pass through mechanism noted in Chapter 6 (see section 6.2.1).

Accredited licences provide for outcome based rather than prescriptive regulation where a licensee has a history of sound environmental management as well as an appropriate environmental management system, audit program and Environment Improvement Plan. EPA Victoria has issued an accredited licence for the Western Treatment Plant. Many of the elements for an accredited licence are in place for the Eastern Treatment Plant and Melbourne Water will work with EPA Victoria to consider the potential benefits of an accredited licence in the context of the current and planned plant upgrades.

2009 Water Plan outcome
Compliance with EPA Victoria discharge licence requirements at the Western and Eastern Treatment Plants.
Undertake works to achieve tertiary level treatment at the Eastern Treatment Plant by 2012.

In order to meet its discharge licence requirements for the Eastern Treatment Plant, Melbourne Water will undertake the following actions over the regulatory period:

- Upgrade the plant to tertiary treatment standards
- Install new aeration tanks to reduce ammonia concentrations in effluent discharges and address load growth
- Install new odour control systems to reduce odour generation
- Sludge drying pan refurbishment and sludge digestion augmentation activities.

In order to meet its discharge licence requirements for the Western Treatment Plant, Melbourne Water will undertake the following actions over the regulatory period:

- Sludge processing and handling works, including undercover de-sludging works
- Mixing zone toxicity investigations and an agreed integrated monitoring program to identify residual mixing zone impacts and to help determine options for further reducing mixing zone impacts in the future
- Odour reduction works to accommodate changing land use adjacent to the plant
- Conservation and habitat improvement works to maintain biodiversity values across the site
- Flood protection works and peak wet weather flow handling works
- Investigate further options for reducing the levels of salt entering the sewerage system.

At both plants, works will be undertaken to ensure continued compliance with discharge licence requirements given forecast growth in sewage volumes and loads from the retail water businesses. At the Eastern Treatment Plant, this includes the completion of works to ensure the plant is able to treat incoming Biological Oxygen Demand and Suspended Solids loads. At the Western Treatment Plant, this includes wet weather upgrade works to ensure the plant is able to comply with the requirement to contain inflows from a one-in-five year wet weather event.

Biosolids

EPA Victoria discharge licences at the Western and Eastern Treatment Plants require Melbourne Water to maximise the reuse of biosolids. While this obligation is unchanged from the 2005 regulatory period, as outlined below, new outcomes and programs are proposed for biosolids reuse over the 2009 regulatory period.

In its guiding principles to establish environmental obligations for water businesses for the next regulatory period, EPA Victoria states that, where water businesses have not adequately implemented sludge management and handling programs and biosolids recycling strategies:

- It will work with businesses to review and update (where appropriate) the sludge management plans or Environment Improvement Plans based on current biosolids and sludge management practices, risk profile and recycling programs
- The businesses should undertake biosolids and sludge management in accordance with the sludge management plans.

EPA Victoria also indicates that specific requirements will be included in discharge licences where both sludge management and progress towards reducing stockpiles and storage of biosolids are not considered adequate. Further, EPA Victoria will work with water businesses to establish agreed programs to eliminate the practice of long-term stockpiling of biosolids and to implement programs for treatment of sludge and recycling of continuously produced biosolids with an ultimate aim of 100% biosolids recycling.

2009 Water Plan outcome

Biosolids reuse of 90,000 cubic metres at the Eastern Treatment Plant for construction fill by 2013.

Further pursue reuse opportunities for biosolids at the Western Treatment Plants over the 2009 regulatory period.

In setting its Water Plan outcomes for the 2009 regulatory period, Melbourne Water has taken the following into consideration:

- Identification of viable reuse options which will contribute to progressively greater reuse of biosolids
- A focus on biosolids reuse irrespective of whether the biosolids are from annual production or stockpiles
- Expenditure prioritisation taking into account Melbourne Water's overall price increase and relative priorities.

In order to meet its discharge licence requirements in relation to biosolids, and deliver the above Water Plan outcomes, the following actions will occur over the 2009 regulatory period:

- The clay-rich biosolids stockpiled at the Eastern Treatment Plant will be used opportunistically for cost effective construction fill applications
- Should technical trials and commercial negotiations be successful, the business case for the Western Treatment Plant biosolids waste to energy recovery project will be completed with a view to implementation within the 2009 regulatory period. Should the project proceed, Melbourne Water proposes that any material costs would be subject to the within period review and pass through mechanism noted in Chapter 6 (see section 6.2.1)
- Research into the management of risks associated with land application of biosolids from Eastern Treatment Plant will continue

- Support will be given to the development of emerging decontamination and reuse technologies where these appear promising for biosolids applications
- A revised Biosolids Strategy is expected to be completed in 2009.

Odour management

The State Environment Protection Policy (Air Quality Management) sets the framework for the management of air emissions and requires:

- All generators of emissions to apply best practice to all activities that may lead to emissions
- Licensed premises to demonstrate that best practice is applied and to adopt a program of continuous improvement.

Melbourne Water's EPA Victoria discharge licences for the Western and Eastern Treatment Plants do not permit offensive odours beyond the boundaries of the plants. While the transfer system is not licensed by EPA Victoria, there is a requirement under the State Environment Protection Policy (Air Quality Management) to apply best practice and continuous improvement.

These are business as usual obligations and Melbourne Water has developed an Odour Management Strategy providing for holistic management of this issue.

2009 Water Plan outcome
No offensive odours beyond the boundaries of the Western and Eastern Treatment Plants.
No more than 10 complaints relating to transfer system odour per annum.

The Odour Management Strategy proposes the following actions over the regulatory period:

- Odour reduction works at the Eastern Treatment Plant, including odour reduction works for the primary tanks and settled sewage channels as well as for the South East Trunk Sewer Manhole 2
- Odour reduction works at the Western Treatment Plant, including cover renewal works on 55 East and 115 East lagoons and chemical dosing to ensure carrier odour control
- Odour reduction works at key priority sites in the transfer system.

7.4.3 Service standards

Core service standards

As with water services, Melbourne Water's sewerage customer service requirements are set out in commercially negotiated service agreements, with each of the retail water businesses. The aim of each Bulk Sewage Transfer, Treatment and Disposal Agreement is to clearly assign rights, obligations, and risks in a vertically disaggregated industry to facilitate efficient and effective compliance with regulatory requirements. In relation to the requirements of Melbourne Water, the agreements contain performance standards relating to required transfer and treatment capacity.

Transfer capacity

Consistent with EPA Victoria requirements regarding sewage spills (see Section 7.4.2), the Bulk Sewage Transfer, Treatment and Disposal Agreements require Melbourne Water to design and operate the sewerage system to ensure that there are no spills in either the Melbourne Water system or the retail water business systems during dry weather (Clause 9.2). Further, Melbourne Water must design and operate the sewerage system to ensure that inflows related to a one-in-five year rainfall event can be managed, noting that spills may occur while work is being progressively undertaken to ensure compliance (Clause 9.3). Dry and wet weather hydraulic performance requirements are also specified at hydraulic information points throughout Melbourne Water's sewerage transfer system (Schedule 1). These are business as usual obligations.

2009 Water Plan outcome

Consistent with the State Environment Protection Policy (Waters of Victoria) spill requirements:

- System failure: Achieve zero spills due to pump station failure or sewer failure including rising mains
- Hydraulic deficiency: Progressively achieve zero spills due to storm events of a severity of up to one-in-five years.

Actions to deliver transfer capacity outcomes over the 2009 regulatory period were outlined in section 7.4.2. They include Melbourne Water's Sewerage Spills Abatement program and its ongoing renewal and maintenance program.

Treatment capacity

Under the Bulk Sewage Transfer, Treatment and Disposal Agreements, Melbourne Water has a general requirement to accept all sewage provided by the retail water businesses provided that pollutants in sewage do not:

- Endanger human life
- Compromise the safety of any person
- Compromise the works of Melbourne Water
- Adversely affect the operation of a sewage treatment plant or any part of the environment.

The detailed performance standards for pollutants which each treatment plant is designed to treat are set out in Schedule 2 of the Agreements and reflect retail water businesses' forecasts of sewage volumes and loads. Pollutants not treated by each plant are specified in Schedule 3. These are business as usual obligations.

2009 Water Plan outcome

Meet the requirements of the Bulk Sewage Transfer, Treatment and Disposal Agreements, including having the ability to treat the retail water business forecasts of volume and treatable pollutant loads.

Actions to deliver treatment capacity outcomes over the 2009 regulatory period were noted in section 7.4.2. Works are proposed to be undertaken at both plants over the regulatory period to ensure continued compliance given forecast growth in sewage volumes and loads from the retail water businesses.

7.4.4 Customer and stakeholder consultation

As a result of consultation and an ongoing process of engagement, Melbourne Water understands that, at this stage, its customers and stakeholders have no significant, outstanding issues. Melbourne Water, therefore, believes that in the main the obligations and requirements detailed above are appropriate, as are the outcomes and activities proposed to achieve these obligations.

7.5 Recycled Water

Melbourne Water treats and supplies recycled water to meet State Government policies and strategies, while complying with legislative, regulatory and customer service requirements.

7.5.1 Overview of Obligations and Strategies

Melbourne Water works with the State Government, EPA Victoria and the retail water businesses to develop and implement initiatives and projects to meet mandatory recycled water targets.

In relation to existing supplies of recycled water, service standards agreed with retail water businesses are set out in Bulk Recycled Water Supply Agreements.

Melbourne Water is also required to transfer recycled water to meet environmental requirements at its sewerage treatment plants.

7.5.2 Statement of Obligations

Under its Statement of Obligations, Melbourne Water is required to implement sustainable water resource management by developing and implementing programs for the sustainable use of recycled water from its sewerage treatment plants and sustainable use of stormwater. Programs developed for recycled water must be consistent with any written directions issued by the Minister for Water, the Metropolitan Joint Water Conservation Plan and salinity reduction strategies.

The current target of recycling 20% of treated effluent from Melbourne's sewerage treatment plants by 2010 is a business as usual obligation. Melbourne Water is to contribute 19.6% to the 20% target. The 20% target was surpassed at the end of the 2005 regulatory period.

New targets developed under the CRSWS include:

- Achieving a further 6.2 GL per annum of potable water substitution by 2015, increasing to 10 GL per annum by 2030
- Developing project proposals for a further 25 GL by 2055 for reuse/recycling opportunities.

Melbourne Water is to contribute 964 ML towards the 6.2 GL potable water substitution target by 2013. It will do this by supplying bulk recycled water for retail water business related projects.

To help meet the potable substitution reuse requirements included in the CRSWS, a Metropolitan Reuse and Recycling Plan (formerly known as the Metropolitan Water Recycling Plan) has been prepared by Melbourne Water and the retail water businesses. The Plan identifies the most efficient, cost-effective and sustainable reuse and recycling projects to meet the potable substitution targets.

Upon achievement of the set targets, potable substitution projects may be considered if the total community cost of water supplied by the project is comparable with the estimated costs of other long term water augmentation options.

2009 Water Plan outcome

Contribute an additional 964 ML per year of recycled water to retail water businesses for potable substitution by 2013.

To meet these obligations and deliver this outcome over the 2009 regulatory period, Melbourne Water will:

- Work closely with the retail water businesses to supply recycled water for projects identified to meet the potable substitution targets
- Confirm the availability of recycled water from the Western Treatment Plant for future reuse taking into account the effects of climate change, reduced rainfall, water restrictions and water conservation programs
- Implement tertiary treatment at the Eastern Treatment Plant to facilitate increased beneficial use of treated water
- Undertake investigations and further develop opportunities for potable substitution and recycling in conjunction with the retail water businesses.

7.5.3 Environmental obligations

Melbourne Water has requirements under State and Federal legislation to conserve habitat for significant wildlife at its sewerage treatment plants (primarily at the Western Treatment Plant, which is a listed wetland Ramsar site).

Relevant legislation includes the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act), *Flora and Fauna Guarantee Act 1988* (FFG Act), *Wildlife Act 1975*, *Planning and Environment Act 1987* (Vic) and the *Catchment and Land Protection Act 1994*.

Requirements under these Acts include protecting the ecological character and values of listed Ramsar sites. Melbourne Water also needs to fulfil its obligations as a land manager for its treatment plant sites.

These are business as usual obligations.

2009 Water Plan outcome
Comply with environmental requirements for the Western Treatment Plant by supply of recycled water on-site and to the foreshore to preserve habitats.

To meet these obligations and deliver this outcome over the 2009 regulatory period, Melbourne Water will:

- Develop and implement a land use strategy for the Western Treatment Plant which will reflect required supplies of recycled water for environmental and land management purposes
- Continue to use recycled water on-site at its treatment plants.

7.5.4 Service standards

As with water and sewerage services, Melbourne Water's service requirements for supply of recycled water are set out in commercially negotiated service agreements with retail water businesses. The aim of the Bulk Recycled Water Supply Agreements is to clearly assign rights, obligations and risks in a vertically disaggregated industry to facilitate efficient and effective compliance with regulatory requirements. In relation to the requirements of Melbourne Water, the agreements contain performance standards relating to the required quality of recycled water.

Melbourne Water currently provides bulk recycled water under supply agreements with:

- Southern Rural Water for supply to the Werribee Irrigation District and Werribee Tourist Precinct
- City West Water for supply to the Werribee Technology Precinct, Mackillop College and Western Treatment Plant Standpipe access
- TopAq for supply to the Eastern Irrigation Scheme
- South East Water for supply to customers along the Eastern Treatment Plant outfall pipeline.

Water quality

The Bulk Recycled Water Supply Agreements require Melbourne Water to supply recycled water of a specified quality at specified points in the supply system. The water quality standards specified in the agreements are primarily focussed on the 'class' of water provided to customers. Class A and Class C recycled water, as defined under EPA Victoria guidelines, is supplied to customers.

This is a business as usual obligation.

2009 Water Plan outcome
Comply with recycled water quality obligations as specified in Bulk Supply Agreements and regulatory guidelines.
Investigate improvements in recycled water quality (e.g. reduction in salinity and improved reliability of recycled water) in response to customer needs.

To meet the obligations and outcomes over the 2009 regulatory period, Melbourne Water will undertake additional risk assessments and monitoring of recycled water quality from the Eastern and Western Treatment Plants and research projects. This is in response to customer feedback over the 2005 regulatory period and in early 2008.

7.5.5 Customer and stakeholder consultation

Melbourne Water works closely with a range of stakeholders including the retail water businesses, Victorian State Government, EPA Victoria and the Department of Human Services to optimise the supply of fit for purpose recycled water to customers. As a result of this consultation and an ongoing process of engagement, Melbourne Water is undertaking the above activities in the area of recycled water quality and reliability, in response to customer concerns.

Melbourne Water will continue to participate in end-customer consultation processes initiated by retail water businesses.

7.6 Corporate services

There are a number of obligations and requirements that are business-wide and relate to each of Melbourne Water's services.

This section sets out these corporate service obligations and requirements, the proposed 2009 regulatory period outcomes and planned activities to achieve these outcomes.

7.6.1 Statement of Obligations

Sustainable management

Under its Statement of Obligations and amendments to the *Water Act 1989*, Melbourne Water has the new obligation of applying Sustainable Management Principles in performing its functions and demonstrating in the 2009 Water Plan how it proposes to apply those principles.

Melbourne Water is required to develop and implement programs for assessing, monitoring and continuously improving its sustainability performance, including:

- Responding to climate change
- Maintaining and restoring natural assets
- Using resources more efficiently
- Managing everyday environmental impacts.

The proposed activities and outcomes relevant to each program are described below.

Responding to climate change

Climate change has serious implications and risks for many parts of Melbourne Water's business. These include:

- Reduced water availability
- Increased potential for bushfires
- Increased flooding and property damage
- Increased incidence of sewage overflows due to higher intensity storms
- Increased sediment and pollutant loadings in stream flow associated with lower flows and higher intensity storms
- Increased capital costs due to changes in underlying assumptions concerning climate change.

Melbourne Water is developing an overall framework for managing climate change to provide an organisational focus for mitigation actions (addressing underlying causes) and adaptation actions (managing effects). The key mitigation and adaptation actions are outlined below.

2009 Water Plan outcome
Reduce greenhouse gas emissions by 40% of Melbourne Water's 2000/01 emissions by 2012/13. This will maintain the greenhouse reduction target from the 2005 regulatory period.
Increase renewable energy used or exported as a percentage of total energy use to 61% by 2012/13.

Melbourne Water is one of the largest (believed to be among the top 15) energy users in Victoria and among the top 300 energy users in Australia, producing about 280,000 tonnes of greenhouse gas emissions (CO2 equivalent) annually. Over the past seven years, Melbourne Water has:

- Reduced its net greenhouse emissions by 50% relative to a 2000/01 baseline (exceeding the 2007/08 target of 40%)
- Increased its renewable energy use or exported to 41% relative to a 2000/01 baseline.

A range of initiatives are planned for the 2009 regulatory period to further reduce greenhouse gas emissions, as well as deliver other environmental benefits, improve process efficiency and reduce costs. The increase in energy intensive water supply and sewage treatment processes will lead to higher levels of greenhouse gas emissions over the 2009 regulatory period, meaning the 40% target will continue to be a challenge. The initiatives to meet the target are:

- Including the cost of renewable energy or greenhouse emission offsets when assessing competing project options
- Continuing efficiency monitoring at major Melbourne Water energy using sites and implementing energy saving actions where identified and cost effective
- Continuing to utilise and increase the production of biogas from sewage treatment processes to generate renewable energy and reduce electricity imported from the grid
- Completing construction of six mini-hydro power stations in the water supply system to generate about 28,000 MWh per year of renewable energy

- Constructing a mini-hydro power station on the Sugarloaf Pipeline to generate up to 17,000 MWh per year of renewable energy for use at Yering Gorge pump station and Winneke treatment plant
- Investigating the production or use of renewable energy from sources such as wind and algal biomass
- Investigating the use of tree plantations and other methods for the sequestration of carbon
- Purchasing renewable energy to meet the energy requirements of the Sugarloaf project.

Planned initiatives to assist in managing the effects of climate change include:

- Developing an integrated and consistent framework for responding to climate change
- Actively monitoring developments in climate change science and adaptation strategies in Australia and overseas
- Participating in climate change research studies on historic climate conditions within the catchments
- Further developing water resource models to integrate climate change, demand projections and new water supplies
- Reviewing and updating the projections and possible impacts for Melbourne's water resource systems, including the impact of climate change on stream flows and water quality, sea level rises and their impact on the sewerage system and flora and fauna in the water catchments
- Developing adaptable flood management responses for Eastern Treatment Plant and Western Treatment Plant, in conjunction with the CSIRO and the Bureau of Meteorology, to deal with rising sea levels and storm surge which could cause infrastructure and operational issues at these sites
- Continuing to work with and assist stakeholders and the community on climate change issues.

Maintaining and restoring natural assets

Melbourne Water has developed a Biodiversity Strategy to protect and improve the biodiversity of the natural assets it manages. Specific initiatives planned for implementing this strategy over the 2009 regulatory period include:

- Completing the remaining flora and fauna surveys for the nine Department of Sustainability and Environment designated sites on Melbourne Water land of high biological significance (Biosites) and developing and implementing management plans for these sites
- Implementing the Western Treatment Plant Biodiversity Conservation Program (which includes long-term water quality monitoring and studies of sediments, aquatic macro-invertebrates, fish, geomorphology, streamside vegetation and rare and threatened trees)
- Investigating natural asset valuation and bio-sequestration options and applying gathered information to enable more efficient biodiversity management outcomes.

Using resources more efficiently

Planned initiatives to increase water use efficiency and energy efficiency are outlined above in the section titled *Responding to Climate Change*.

The types of waste that Melbourne Water produces from its water and sewerage activities include effluent, biosolids, water treatment sludge, construction waste, wastewater grit and screenings, heat, operations and maintenance waste as well as prescribed wastes.

Planned initiatives over the 2009 regulatory period include:

- Developing a consolidated Waste Strategy to reduce waste from all of Melbourne Water's operations
- Strengthening and applying Melbourne Water's Sustainable Procurement Policy and associated guidelines.

Managing everyday environmental impacts

Melbourne Water has an extensive range of policies and procedures in place to minimise its everyday environmental impacts. In addition, the OfficeSmart program was introduced in 2008 to focus on minimising environmental impacts at all office sites. The program, which draws on the ideas and involvement of Melbourne water people, aims to reduce waste, water, energy and paper use through targets linked to the Enterprise Agreement for employees and individual salary increments. A Sustainable Sites program complements these educational activities with infrastructure changes to assist in achieving the targets in these four areas. It is planned to run the OfficeSmart and Sustainable Sites programs for the duration of the 2009 regulatory period.

Government Policies on Energy and Greenhouse Emissions

The State and Commonwealth Government have recently established policies that require Melbourne Water to monitor, report and improve energy efficiency. This is a new obligation and requires formal energy efficiency audits to be undertaken.

Under EPA Victoria's Environment and Resource Efficiency Plans, Melbourne Water is required to invest in energy efficiency projects which have a 3-year or less payback period at sites exceeding energy and water use thresholds (Winneke, Western Treatment Plant and Eastern Treatment Plant).

Under the Commonwealth Government's Energy Efficiency Opportunities scheme, Melbourne Water must report on energy efficiency at plants exceeding an energy use threshold (Winneke, Western Treatment Plant and Eastern Treatment Plant).

The Commonwealth has established the National Greenhouse and Energy Reporting System to measure and report on energy and greenhouse gas emissions. This system will form the cornerstone for the proposed Carbon Pollution Reduction Scheme (CPRS).

The Commonwealth Government has recently released a Green Paper on the proposed CPRS. The Green Paper identifies the wastewater industry as a sector covered under the Scheme which will cover Melbourne Water's two sewerage treatment plants. Under thresholds proposed in the Green Paper, Melbourne Water will have to purchase carbon permits to offset emissions from its sewerage treatment plants.

Managing assets

Under its Statement of Obligations, Melbourne Water must develop and implement plans, systems and processes to manage its assets. This must be done in such a way as to:

- Allow services to be supplied sustainably
- Maintain the levels and standards of service
- Minimise the overall whole of life cost of assets
- Minimise detrimental social, economic or environmental effects.

Melbourne Water must consider cultural heritage aspects and issues when managing its assets. The management of assets both operational and non-operational is greatly influenced in cases where there are heritage issues. Melbourne Water must comply with legislative requirements set out in the *Heritage Act 1995*, *Aboriginal Act 2006* and *Planning and Environment Act 1987* along with local government requirements for the protection of cultural heritage values. These are business as usual obligations with the exception of meeting heritage requirements under the *Aboriginal Act 2006* which is a new obligation.

Melbourne Water is also required to manage and maintain assets on behalf of the Crown as directed by the Minister. These include non-operational assets at Beaconsfield, Devilbend and Frankston reservoirs and the Main Outfall Sewer. This is a new obligation.

2009 Water Plan outcome
Melbourne Water will ensure its assets are managed to maintain levels and standards of service, while minimising whole of life asset cost as well as detrimental social and environmental impacts.
Melbourne Water will manage and maintain assets on behalf of the Crown as directed by the Minister.

To meet the above obligations over the regulatory period, and deliver the above outcomes, Melbourne Water will continue to:

- Maintain and update the Asset Management System, including the Strategic Asset Management Plans
- Undertake an Annual Condition Assessment Report for assets
- Undertake appropriate asset renewal and maintenance activities (see Chapters 9, 10 and 11).

In relation to its new obligation, Melbourne Water will undertake spillway and scouring works at the non-operational Devilbend and Frankston Reservoirs.

Managing Risks

Under its Statement of Obligations, Melbourne Water must develop and implement plans, systems and processes, taking into account the Australian/New Zealand Standard AS/NZS 4360 – Risk Management, to ensure that risks to its assets or services are identified, assessed, prioritised and managed. These are business as usual obligations.

2009 Water Plan outcome

Ensure that risks to Melbourne Water's assets or services are identified, assessed, prioritised and managed taking into account the Australian/New Zealand Standard AS/NZS 4360.

To ensure that the risks and opportunities to Melbourne Water are identified, assessed and managed in an appropriate manner, the following activities will be undertaken:

- Annual strategic risk review by the Board and leadership team
- Internal audit of areas of risk, as part of the internal audit program
- Risk compliance assessment reporting to the Audit and Corporate Risk Committee.

Response to Incidents and Emergencies

Under its Statement of Obligations, Melbourne Water must include in any plan, system or process to manage its risks, measures to deal with emergencies and incidents, including measures to deal with:

- The disruption of services
- Incidents resulting in waste discharges to the environment
- A dam failure
- Potential security risks, including but not limited to terrorist attacks
- Flooding in any waterway in the metropolis or which flows into works operated by the Authority.

Melbourne Water must also undertake periodic training and exercises to ensure that an emergency management plan can be implemented effectively. These are business as usual obligations.

2009 Water Plan outcome

Melbourne Water will ensure that the management of emergencies and incidents are included in relevant plans, systems and processes and that periodic training is undertaken.

To meet the above obligations over the regulatory period, and deliver the above outcome, Melbourne Water will continue to:

- Conduct emergency management training for its people
- Conduct emergency management exercises on an annual basis with government departments and emergency services and every two years with the retail water businesses
- Review contingency plans for relevance and accuracy
- Review the security measures in place at asset and facility sites
- Liaise with relevant departments and agencies to ensure a coordinated approach to managing incidents and emergencies.

Environmental Management Systems

Under its Statement of Obligations, Melbourne Water must develop and implement an Environmental Management System that is in accordance with the ISO 14000 series of management system standards.

This is a business as usual obligation.

2009 Water Plan outcome

Maintain an Environmental Management System externally certified to the ISO 14001: 2004 standard.

Melbourne Water has an environmental management system in place that has been externally certified to the ISO 14001 standard since December 1999. The system was recertified in September 2008.

To meet its obligations over the 2009 regulatory period, Melbourne Water will:

- Facilitate external annual surveillance and three-yearly recertification audits as required
- Conduct a rolling program of internal audit checks to provide confidence that the system is working effectively.

7.6.2 Other

Complaints to Energy and Water Ombudsman (Victoria)

The Commission's 2005 Price Determination included an indicator for the number of complaints to the Energy and Water Ombudsman (Victoria) (EWOV) as an approved service standard for Melbourne Water. For the purposes of the 2009 Water Plan, Melbourne Water proposes that the service standard be changed to the percentage of complaints referred to EWOV that are responded to within EWOV established timeframes. Melbourne Water considers that this is a better measure of Melbourne Water's efficiency in responding to and resolving complaints.

An alternative indicator for the 2009 regulatory period is to base the number of complaints on every 1,000 customers. In this regard, it is noted that the majority of Melbourne Water's complaints to EWOV relate to the provision of waterways and drainage services. Melbourne Water has increased the area of responsibility for waterways and drainage services in the 2005 regulatory period, providing these services direct to the greater Melbourne community. Any indicator detailing the number of complaints to EWOV would need to consider the increase in the number of waterways and drainage customers (in excess of 1.5 million customers as at 30 June 2008) compared to the historical number of complaints to EWOV. Further, the retail water businesses, each with approximately 400,000 to 700,000 water customers, have service standards ranging from 0.06 to 0.12 per 1,000 customers in complaints to EWOV set for them in 2007/08. As an alternative, a similar standard set in proportion with the number of customers would also be appropriate for Melbourne Water.

2009 Water Plan outcome

100% of complaints referred to EWOV responded to within EWOV established timeframes

To deliver the 2009 Water Plan outcome, Melbourne Water will continue to review its systems and processes in place to resolve EWOV customer queries and complaints and conduct necessary training for its people.

Chapter 8

Demand

The metropolitan water industry has developed an agreed set of demand forecasts, based on reasonable assumptions, using the best available data and forecasting methodologies.

The proposed demand forecasts reflect the effects of a growing population, economic development, water conservation and drought response measures, including restrictions, as well as waste minimisation initiatives.

This chapter identifies the primary drivers of demand for the services provided by Melbourne Water and outlines the methodologies, assumptions and data used to develop the demand forecasts.

In its September 2006 *Guidance on Water Plans,* the Commission noted that any methodology used to prepare demand forecasts for water services should:

- Be statistically unbiased
- Recognise and reflect key drivers of demand and supply
- Be based on reasonable assumptions using the best available information
- Be consistent with other existing forecasts and methodologies
- Use the most recent data available, as well as historic data that can identify trends in demand
- Take account of current demand and economic conditions as well as reasonable prospects for future market development.

In its September 2008 *Supplementary Guidance on Water Plans* the Commission also noted that businesses should exercise discretion and match the level of detail contained in their demand forecast with the materiality of the demand information and accompanying revenue impacts. In addition, the proposed forecasts are required to be consistent with relevant strategies and plans such as the *Central Region Sustainable Water Strategy* (CRSWS) and the *Water Supply-Demand Strategy* (WSDS) for Melbourne. More recently, the State Government has also released *Our Water Our Future: the Next Stage of the Government's Water Plan* (the State Government's Water Plan).

The price and expenditure proposals presented in the 2009 Water Plan require annual and peak period demand forecasts for water, sewage volumes and loads, and forecast demand for recycled water.

The following demand forecasts are an important input for Melbourne Water's business planning and pricing. In particular:

- Peak water demands and sewage flows drive investment to increase capacity in the water and sewage transfer systems
- Annual water and sewage volumes and sewage load drive investment to increase capacity in water supply headworks and sewage treatment plants respectively
- Annual volumes also drive water and sewerage operating costs, prices, and revenue received from the retail water businesses
- Annual water demands are an important input to the development of the Drought Response Plan for the Melbourne water industry and in assessing security of supply
- Peak and annual demand for recycled water services influence investment in recycled water infrastructure. Annual demand for recycled water is a driver in determining operating costs, prices and revenue received from the retail water businesses.

8.1 Water

8.1.1 Drivers of demand

Annual and peak demands on Melbourne Water's water supply system are driven by the retail water businesses' demands, which in turn reflect demand by end-users. The key drivers of end-user demand, identified by the retail water businesses, are:

- Household demographics, growth and housing trends
- Demand from large industrial and commercial users, which reflect economic conditions
- Climatic conditions, particularly rainfall and temperature
- Water conservation measures impacting on indoor or outdoor use (e.g. education and rebate programs, regulation and pricing reforms)
- Leakage and system losses
- The community's response to water supply restrictions.

The State Government's Water Plan, the CRSWS and the WSDS provide an integrated regional approach to balancing water supply and demand. This includes targets and measures to encourage lower water demand and to augment supply, which aides storage level recovery and assists in lifting water supply restrictions.

8.1.2 Forecasting methodology

The retail water businesses manage the interface with the final end-users and often have more information in relation to the drivers of end-use. Consequently, Melbourne Water has worked with the retail businesses to develop forecasts of peak and annual demand based on:

- An agreed set of assumptions
- A review of retail water business forecasts both individually, and in aggregate, to confirm they are fair and reasonable.

Melbourne Water has also provided information on supply issues, such as expected future storage levels, and the probability of different levels of restrictions, to assist the retail water businesses in assessing the likely impact of restrictions on end-user demand. In doing so, Melbourne Water adopted the CRSWS assumption that low storage inflows, observed over the last ten years, will continue.[73] This analysis also took into account the additional water supplied by drought contingency measures and water supply augmentations contained in the State Government's Water Plan.

8.1.3 Assumptions and data inputs

The retail water businesses and Melbourne Water have agreed the following assumptions as a basis for developing forecasts of annual water volumes:

- The forecasts will reflect measures to achieve the CRSWS and WSDS target of at least a 30% reduction in per capita use compared to the 1990's average by 2015. These measures include AAA shower head replacement programs and other initiatives, including leakage reduction, and potable water substitution. Additional measures include an expansion of business water saving plans to cover Melbourne's top 1,000 businesses
- An agreed set of restriction levels have been assumed by Melbourne Water and the metropolitan retail water businesses. These are Stage 3A for 2008/09 and 2009/10 followed by Stage 2 in 2010/11, Stage 1 in 2011/12 and permanent water restrictions in 2012/13. The expected level of restrictions has been assessed adopting the CRSWS assumption of a long-term average storage inflow reduction of 30% and water supply augmentations as per the State Government's Water Plan[74]
- Consistent with the CRSWS, it is assumed that behavioural change following the lifting of water restrictions in 2005 has locked in a permanent reduction in water demand
- Updated *Victoria in the Future* population growth projections are yet to be released. Therefore the retail water businesses have used census data, Department of Planning and Community Development projections and regression analysis to forecast household and population growth. These forecasts have regard to emerging patterns of higher than expected rates of immigration
- A further reduction in demand will arise from the implementation of real price increases for all customers.

8.1.4 Review of retail water businesses' forecasts

Annual Demand

Melbourne Water has taken the following steps in reviewing the annual demand forecasts provided by the retail water businesses:

- Aggregated the forecasts to ensure delivery of relevant CRSWS water saving targets

[73] The CRSWS also discussed a scenario based on a return to average stream flow conditions. However, it recommends planning based on the low flow scenario because the consequences of managing water supplies for average inflows, if they do not eventuate, are unacceptable. In addition to these two potential outcomes, the State Government's Water Plan also considers a scenario whereby the very low storage inflows experienced over the last three years (2004, 2005 and 2006) are repeated.

[74] At the end of the 2008 filling season, a further assessment of restriction levels will be made, with any updated demand information to be provided to the Commission.

- Assessed the reasonableness of the forecasts by:
  - Checking for any significant changes from previous years' forecasts and actual water demand
  - Ensuring that the forecasts are consistent with relevant longer-term trends published in external sources, e.g. Government land release forecasts, *Melbourne 2030* and the CRSWS
  - Conducting workshops (internally and with the retail water businesses) and comparing the forecasts to estimates prepared by Melbourne Water
- Presenting proposed Water Plan capital and operating plans and associated impacts of demand forecasts to the retail water businesses.

Peak Day Demand

Melbourne Water has taken the following steps in reviewing the peak day demand forecasts provided by the metropolitan retail water businesses:

- Assessed the reasonableness of the forecasts by:
  - Comparisons with previous years' forecasts and trends in water use
  - Allowing for a reduction in peak demands due to water restrictions
- Anomalies and significant variations were discussed with the retail water businesses and adjustments were made where necessary
- Sensitivity analysis was undertaken and the impacts on Melbourne Water's capital expenditure plan were assessed. Any issues arising from the analysis were discussed and resolved with the retail water businesses.

Forecasts

The results of applying the above methodology and assumptions are provided in Table 8.1, for the period 2009/10 to 2012/13, compared to actual consumption for the period 2005/06 to 2007/08 and forecasts for 2008/09. Water volumes are expected to increase over the 2009 regulatory period from 374.6 GL in 2009/10 to 402.4 GL in 2012/13..

Table 8.1: Annual Demand Forecasts (GL)

	2005/06	2006/07	2007/08	2008/09	2009/10	2010/11	2011/12	2012/13
CWW	109.8	99.6	93.8	95.5	94.4	97.0	97.7	96.2
SEW	155.4	142.7	133.6	129.3	128.3	137.5	144.3	144.8
YVW	169.8	159.1	143.2	141.6	140.4	145.1	148.3	149.7
WW	10.1	11.3	10.4	11.3	11.3	11.3	11.3	11.3
GW	0.1	0.1	0.2	0.2	0.2	0.3	0.3	0.4
Total	445.2	412.8	381.2	377.9	374.6	391.2	401.9	402.4

South East Water, Yarra Valley Water and City West Water have all forecasted increases in water volumes over the 2009 regulatory period, reflecting the assumed gradual lifting of restrictions. South East Water's water demand increases at a faster rate than the other two businesses due to different approaches in the modelling of savings under restrictions, as well as assumed rates of household and population growth. Western Water's demand reflects its bulk entitlement to the Melbourne system. Western Water expects to obtain an additional 5 GL entitlement as foreshadowed in the CRSWS due to growth but does not intend to draw on the entitlement during the 2009 regulatory period. Gippsland Water is also forecasting increases in water volumes over the 2009 regulatory period due to growth.

The State Government's Water Plan announced an extension of the Victorian Water Grid to connect Barwon Water, Westernport Water and South Gippsland Water to the Melbourne Water supply system. These retailers have been excluded from the demand estimates for the purposes of the 2009 Water Plan, given the current uncertainty regarding expected volumes and demand profiles due to:

- Dependency of Westernport Water and South Gippsland Water on the completion of the Victorian Desalination Project at the end of the 2009 regulatory period
- Uncertain timing of the Barwon – Melbourne Connector project as noted by the Commission in its *2008 Water Price Review*.

8.2 Sewerage

8.2.1 Drivers of demand

As with water services, the demand for Melbourne Water's sewerage services is driven largely by end-user discharges. The main drivers of Melbourne Water and retail water business peak, and annual sewage volumes and loads, are:

- Growth in existing retail water business customer discharges or connecting new customers (including sewerage backlog programs)
- Level of activity in major industries
- Water conservation measures impacting on residential indoor use (e.g. adoption rates for water efficient appliances such as AAA washing machines and shower roses)
- Climatic conditions, particularly rainfall due to its impact on inflow and infiltration.

8.2.2 Forecasting methodology

In developing the proposed forecasts Melbourne Water has worked with the retail water businesses to:

- Establish an appropriate set of assumptions
- Review the retail water business forecasts to ensure that, when aggregated, they are fair and reasonable and consistent with Melbourne Water high level estimates.

Given that Melbourne Water is proposing to charge different prices for its eastern and western sewerage systems, expected discharges to the Eastern and Western Treatment Plants were developed. To support pollution load pricing, forecasts were developed for Biochemical Oxygen Demand (BOD), suspended solids (SS), Total Kjeldahl Nitrogen (TKN) and inorganic total dissolved solids (TDS).[75] Consistent with the billing methodology agreed with the retail water businesses, the forecasts were also split into discharges by major trade waste customers and other customers.[76]

[75] From 2009/10 it is proposed to use TKN as a load factor, instead of Total Nitrogen, and to use Inorganic TDS instead of TDS. See Chapter 14, section 14.4.2 for further details.

[76] Major trade waste customers are defined as those trade waste customers that currently pay charges based on measured volumes and loads.

8.2.3 Assumptions and data inputs

The following assumptions were agreed between the retail water businesses to develop forecasts for sewage volumes and loads:

- A permanent decrease in domestic volumes due to flow-on effects from the observed decline in household water consumption levels
- Domestic volumes reflect population growth forecasts consistent with the water demand assumptions
- Domestic load forecasts reflect assumed loads per household and household growth
- Industrial closures have been factored into the forecasts
- Discharges from trade waste customers reflect individual retail water business strategies but:
  - Reflect the overall level of economic activity overlayed with the effect of cleaner production initiatives
  - New customers are expected to employ water saving and waste minimisation technologies
  - Volume reductions from industrial customers are expected to be greater than load reductions, resulting in an increase in concentrations
- Inflow and infiltration will remain at average levels as a result of the effects of ageing sewers being offset by rehabilitation measures, new technologies and network expansion
- A further reduction in demand will arise from the implementation of a real price increase for all customers.

8.2.4 Review of retail water businesses' forecasts

Forecasts

The results of applying the above methodology and assumptions are provided in Tables 8.2 to 8.6 below. These reflect an ongoing process of consultation between Melbourne Water and the retail water businesses.

Volume

Table 8.2 shows that Western sewerage system volumes are expected to increase from 145.8 GL in 2009/10 to 150.6 GL in 2012/13. This increase is a result of expected customer growth and flow on effects from the lifting of restrictions. Yarra Valley Water forecast a slight decline due to end-user behavioural change.

Table 8.2: Annual Sewage Volume Forecasts, Western System (GL)

	2005/06	2006/07	2007/08	2008/09	2009/10	2010/11	2011/12	2012/13
CWW	78.3	65.4	67.2	60.2	60.3	62.4	63.4	62.9
SEW	22.6	32.3	26.5	26.0	25.9	28.2	29.0	29.0
YVW	65.0	61.2	58.1	58.8	59.6	59.2	58.9	58.7
Total	165.9	158.9	151.8	145.0	145.8	149.8	151.3	150.6

Table 8.3 illustrates that sewage volumes in the Eastern sewerage system are expected to increase from 116.7 GL in 2009/10 to 127.8 GL in 2012/13. This results largely from increased sewage flows from South East Water.

Table 8.3: Annual Sewage Volume Forecasts, Eastern System (GL)

	2005/06	2006/07	2007/08	2008/09	2009/10	2010/11	2011/12	2012/13
SEW	80.6	68.2	68.0	69.0	69.0	77.6	80.4	80.3
YVW	53.0	45.8	46.3	47.6	47.7	47.7	47.6	47.5
Total	133.6	114.0	114.3	116.6	116.7	125.3	128.0	127.8

Pollution load

In addition to the forecasted quantity of sewage to be discharged into Melbourne Water's sewerage systems, retail water businesses have provided forecasts of various dimensions of the quality (or pollution load) of the sewage.

With the exception of BOD and inorganic TDS in the Western system (which are decreasing as a result of the expected closure of two major industrial trade waste customers), sewage loads are forecast to grow over the 2009 regulatory period as population and economic growth outweigh the effects of waste management initiatives and industrial closures.

Table 8.4 sets out forecasted total loads expected to be received in the Western and Eastern systems while Tables 8.5 and 8.6 shows each retail water businesses' forecast contribution to system loads.

Table 8.4: Annual Load Forecasts ('000 tonnes)

	2005/06	2006/07	2007/08	2008/09	2009/10	2010/11	2011/12	2012/13
Western System								
BOD	64.2	63.9	68.2	66.6	66.4	66.1	63.1	63.2
SS	62.0	63.6	65.3	65.4	65.8	66.5	66.6	67.0
Total Kjedahl Nitrogen	10.2	10.3	10.5	10.5	10.7	10.8	10.9	11.0
Inorganic TDS	128.3	126.4	128.9	112.9	112.8	112.9	111.2	111.6
Eastern System								
BOD	46.6	46.8	46.5	47.4	47.8	48.2	48.6	49.0
SS	54.7	54.9	56.4	56.5	57.0	57.6	58.0	58.5
Total Kjedahl Nitrogen	7.9	8.0	8.2	8.2	8.3	8.4	8.5	8.7
Inorganic TDS	70.9	71.7	68.1	57.9	58.5	59.3	59.9	60.5

Note: Melbourne Water does not measure pollution load at the retail interface point. Historic pollution loads have been estimated for each retail water business using billed load and retail water business data.

Table 8.5: Annual Load Forecasts by Retail Water Business, Western System ('000 tonnes)

	2005/06	2006/07	2007/08	2008/09	2009/10	2010/11	2011/12	2012/13
Biochemical Oxygen Demand								
CWW	**28.9**	**28.4**	**29.7**	**26.8**	**26.3**	**26.3**	**26.3**	**26.0**
– Major trade waste	12.0	12.9	12.0	9.1	8.5	8.0	7.6	7.2
– Other	16.9	15.5	17.7	17.7	17.8	18.3	18.7	18.8
SEW	**9.7**	**9.6**	**9.8**	**9.8**	**10.0**	**10.1**	**10.2**	**10.4**
– Major trade waste	1.6	1.5	1.5	1.4	1.4	1.4	1.4	1.4
– Other	8.1	8.1	8.3	8.4	8.6	8.7	8.8	9.0
YVW	**25.6**	**25.9**	**28.7**	**30.0**	**30.1**	**29.7**	**26.6**	**26.8**
– Major trade waste	5.8	6.0	8.5	9.6	9.6	9.0	5.8	5.8
– Other	19.8	19.9	20.2	20.4	20.5	20.7	20.8	21.0
Suspended Solids								
CWW	**25.9**	**27.2**	**27.1**	**26.3**	**26.3**	**26.7**	**26.9**	**26.9**
– Major trade waste	5.6	5.8	5.8	4.7	4.5	4.2	4.0	3.8
– Other	20.3	21.4	21.3	21.6	21.8	22.5	22.9	23.1
SEW	**10.6**	**10.6**	**10.8**	**11.0**	**11.2**	**11.4**	**11.6**	**11.8**
– Major trade waste	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2
– Other	10.3	10.4	10.6	10.8	11.0	11.2	11.4	11.6
YVW	**25.5**	**25.8**	**27.4**	**28.1**	**28.3**	**28.4**	**28.1**	**28.3**
– Major trade waste	1.2	1.5	2.8	3.2	3.2	3.0	2.5	2.5
– Other	24.3	24.3	24.6	24.9	25.1	25.4	25.6	25.8
Total Kjedahl Nitrogen								
CWW	**4.3**	**4.4**	**4.5**	**4.4**	**4.4**	**4.5**	**4.5**	**4.5**
– Major trade waste	0.8	0.9	0.8	0.6	0.6	0.6	0.5	0.5
– Other	3.5	3.5	3.7	3.8	3.8	3.9	4.0	4.0
SEW	**1.8**	**1.8**	**1.7**	**1.8**	**1.9**	**1.9**	**1.9**	**2.0**
– Major trade waste	0.1	0.1	0.0	0.1	0.1	0.1	0.1	0.1
– Other	1.7	1.7	1.7	1.7	1.8	1.8	1.8	1.9
YVW	**4.1**	**4.1**	**4.3**	**4.3**	**4.4**	**4.4**	**4.5**	**4.5**
– Major trade waste	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.2
– Other	4.0	4.0	4.1	4.1	4.2	4.2	4.3	4.3
Inorganic Total Dissolved Solids								
CWW	**64.6**	**63.6**	**65.0**	**55.4**	**54.7**	**55.0**	**55.1**	**55.1**
– Major trade waste	30.5	32.8	31.2	21.7	20.5	20.3	20.2	20.1
– Other	34.1	30.8	33.8	33.7	34.2	34.7	34.9	35.0
SEW	**14.0**	**14.2**	**14.5**	**13.7**	**14.0**	**14.2**	**14.4**	**14.7**
– Major trade waste	1.1	1.2	1.2	0.2	0.2	0.2	0.2	0.2
– Other	12.9	13.0	13.3	13.5	13.8	14.0	14.2	14.5
YVW	**49.7**	**48.6**	**49.4**	**43.8**	**44.1**	**43.7**	**41.7**	**41.8**
– Major trade waste	9.6	9.5	11.8	5.0	5.0	4.6	2.7	2.7
– Other	40.1	39.1	37.6	38.8	39.1	39.1	39.0	39.1

Note: Melbourne Water does not measure pollution load at the retail interface point. Historic pollution loads have been estimated for each retail water business using billed load and retail water business data.

Table 8.6: Annual Sewage Load Forecasts by Retail Water Business, Eastern System ('000 tonnes)

	2005/06	2006/07	2007/08	2008/09	2009/10	2010/11	2011/12	2012/13
Biochemical Oxygen Demand								
SEW	**28.5**	**28.2**	**28.4**	**29.0**	**29.3**	**29.7**	**30.0**	**30.4**
– Major trade waste	7.4	7.0	6.7	6.9	6.9	6.9	6.8	6.8
– Other	21.1	21.2	21.7	22.1	22.4	22.8	23.2	23.6
YVW	**18.1**	**18.6**	**18.1**	**18.4**	**18.5**	**18.5**	**18.6**	**18.6**
– Major trade waste	1.1	1.6	1.5	1.7	1.7	1.7	1.7	1.7
– Other	17.0	17.0	16.6	16.7	16.8	16.8	16.9	16.9
Suspended Solids								
SEW	**28.1**	**28.1**	**28.8**	**29.1**	**29.5**	**30.0**	**30.4**	**30.8**
– Major trade waste	2.9	2.8	2.9	2.8	2.8	2.8	2.8	2.7
– Other	25.2	25.3	25.9	26.3	26.7	27.2	27.6	28.1
YVW	**26.6**	**26.8**	**27.6**	**27.4**	**27.5**	**27.6**	**27.6**	**27.7**
– Major trade waste	2.5	2.8	3.7	3.4	3.4	3.4	3.4	3.4
– Other	24.1	24.0	23.9	24.0	24.1	24.2	24.2	24.3
Total Kjedahl Nitrogen								
SEW	**4.7**	**4.7**	**4.8**	**4.8**	**4.9**	**5.0**	**5.1**	**5.2**
– Major trade waste	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.3
– Other	4.3	4.4	4.5	4.5	4.6	4.7	4.8	4.9
YVW	**3.2**	**3.3**	**3.4**	**3.4**	**3.4**	**3.4**	**3.4**	**3.5**
– Major trade waste	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1
– Other	3.2	3.2	3.3	3.3	3.3	3.3	3.3	3.4
Inorganic Total Dissolved Solids								
SEW	**48.7**	**50.2**	**51.2**	**41.1**	**41.7**	**42.4**	**43.0**	**43.6**
– Major trade waste	13.6	14.9	14.9	4.2	4.2	4.2	4.2	4.2
– Other	35.1	35.3	36.3	36.9	37.5	38.2	38.8	39.4
YVW	**22.2**	**21.5**	**16.9**	**16.8**	**16.8**	**16.9**	**16.9**	**16.9**
– Major trade waste	1.8	2.3	2.2	1.0	1.0	1.0	1.0	1.0
– Other	20.4	19.2	14.7	15.8	15.8	15.9	15.9	15.9

Note: Melbourne Water does not measure pollution load at the retail interface point. Historic pollution loads have been estimated for each retail water business using billed load and retail water business data.

8.3 Recycled water

8.3.1 Driver of demand

Recycled water users mainly comprise non-residential customers including agricultural producers, open space and recreational facility operators, and commercial businesses. The growth in demand for recycled water from residential customers, and the implementation of dual pipe schemes have, to date, been relatively slow in Melbourne.

End-users primarily drive the demand for recycled water. The key drivers of user demand are:

- Availability of water. Where supply of other sources of water (e.g. potable supply, river water and groundwater) are limited, deemed undesirable or restricted, recycled water becomes a more attractive substitute product
- Government policies and regulation. Where the use of recycled water is mandated or encouraged, recycled water usage is expected to increase
- Water conservation measures and policies, which indirectly encourage recycled water use
- Climatic conditions, particularly rainfall and temperature, which impact on summer water use when potable supply for outdoor and agriculture uses is experiencing the highest demand
- Demand from industrial and commercial users, which can reflect economic conditions
- Price differences between recycled water and other sources of water. Where the price of other sources of water increases, or the price differential between recycled water and other sources of water decreases, recycled water may be regarded more favourably by customers as a substitute product. The retail price of potable water is expected to increase substantially by 2012/13, predominantly due to implementing water augmentation projects.

8.3.2 Forecasting methodology

Approximately 95% of recycled water in Melbourne is sourced from Melbourne Water's two sewerage treatment plants – the Western Treatment Plant and the Eastern Treatment Plant. The Western Treatment Plant supplies recycled water to customers in the Werribee area and to the plant itself for a number of on-site uses. The Eastern Treatment Plant supplies recycled water for customers in the Eastern Irrigation Scheme, customers along the South Eastern Outfall and for on-site use at the plant.

The adopted forecasting methodology is tailored to particular schemes and has been developed in consultation with the recycled water retailers. The process has included the following steps:

- Consultation with retail water businesses/existing customers
- Analysis of historical recycled water usage
- Consideration of any development studies undertaken. Forecast volumes for planned schemes were developed based on assumptions about project start-up dates and volume take-up rates
- Consideration of future conditions and planned developments affecting recycled water demand.

8.3.3 Assumptions

The following assumptions have been used as the basis for developing demand forecasts for annual recycled water volumes:

- Recycled water projects are designed to achieve reuse targets consistent with the 2008 Metropolitan Reuse and Recycling Plan[77]
- Salt reduced recycled water is not currently supplied to the retail water businesses by Melbourne Water. The Salinity Reduction Strategy seeks to identify ways to reduce salinity levels for the needs of specific customers
- Measures to achieve the CRSWS and WSDS target of at least a 30% reduction in per capita use compared to the 1990's average by 2015
- Climatic conditions are based on dry conditions continuing throughout the 2009 regulatory period but with some recovery in the later years. In average conditions, supply to the Werribee Irrigation District and Werribee Tourist Precinct would be a mix of recycled water, river water and groundwater. If river water is not available, recycled water is supplied on its own. At the start of 2008/09, the Werribee Irrigation District has a 2% river allocation and a complete ban on groundwater
- Normal operating conditions[78] apply
- A minimum volume of recycled water per annum will be reserved for land management purposes in the 2009 regulatory period at the Western Treatment Plant. The forecasted volumes to manage land salinity issues are currently being reviewed in formulating the salinity and sodicity management strategy for the Western Treatment Plant. Additional flows can also be supplied for on-site irrigation depending on (inherently unreliable) availability of any surplus recycled water. These volumes will not be offered to new off-site projects until the salinity management profile demand is finalised
- The Western Treatment Plant is a listed Ramsar[79] site. A volume of recycled water is reserved for conservation purposes at the plant to fulfil environmental obligations.

8.3.4 Recycled Water Schemes

Current and planned recycled water schemes

The 2008 Metropolitan Reuse and Recycling Plan has been prepared with the metropolitan retail water businesses to identify the metropolitan Melbourne water recycling projects required to achieve the potable substitution targets of 6.2 GL per year by 2015 and 10 GL per year by 2030.

Over the 2009 regulatory period, Melbourne Water is expected to supply the recycled water projects listed in Chapter 7. In addition Melbourne Water has forecast demand for a new recycling project (Werribee West) from 2011/12.

[77] This plan is currently awaiting endorsement from Melbourne's water businesses.

[78] Normal operating conditions includes an absence of algal blooms which under current treatment processes would interrupt recycled water supply.

[79] The Convention on Wetlands, signed in Ramsar, Iran in 1971, is an intergovernmental treaty providing the framework for national action and international cooperation for the conservation and wise use of wetlands and their resources.

8.3.5 Forecast ed demand

Table 8.7 sets out actual and forecasted demand from external recycled water projects from Melbourne Water's Eastern and Western Treatment Plants over the period 2005/06 to 2012/13. Actual demand is included for 2005/06 to 2007/08 and forecasted demand is included from 2008/09 to 2012/13.

As a result of continued drought, the actual demand for recycled water was high in 2007/08. This level of demand may not be sustained when climatic conditions return to more normal levels.

Table 8.7: External Recycled Water Demand (ML)

	2005/06	2006/07	2007/08	2008/09	2009/10	2010/11	2011/12	2012/13
Eastern Treatment Plant								
South East Water	1,458	2,128	1,304	1,600	1,600	1,600	1,600	1,600
TopAq	5,174	8,296	6,577	5,000	5,000	5,000	5,000	5,000
Total	6,632	10,424	7,881	6,600	6,600	6,600	6,600	6,600
Western Treatment Plant								
Southern Rural Water[80]	1,354	11,166	12,722	13,250	12,250	10,850	10,850	10,850
City West Water	0	101	295	500	500	610	900	1,255
Total	1,354	11,267	13,017	13,750	12,750	11,460	11,750	12,105

[80] Forecast volume for Werribee Tourist Precinct included as Southern Rural Water is expected to be responsible as the retailer in the later part of 2008

Chapter 9

Planning

Melbourne Water's planning processes are integrated and robust and provide for appropriate stakeholder engagement and consultation.

Melbourne Water's capital planning and delivery processes have been strengthened to take account of the results of recent reviews and benchmarking studies.

Melbourne Water's asset management practices have been independently benchmarked as being close to best industry practice and further improvement measures are being implemented.

Melbourne Water has played a key role in assisting the State Government in water resource planning through the development of *Our Water, Our Future: the Next Stage of the Government's Water Plan* (the State Government's Water Plan) and the *Central Region Sustainable Water Strategy* (CRSWS) and the 2009 Water Plan.

This chapter provides an overview of how Melbourne Water undertakes planning in order to meet its obligations and future demands for the services discussed in the previous chapters.

The principal planning processes are outlined, together with the key planning documents and outcomes from each process. These include:

- Strategic and corporate planning
- Capital planning, including project planning, approvals and delivery
- Asset management
- Operating planning
- Water resource planning
- Sewerage planning.

9.1 Strategic and corporate planning

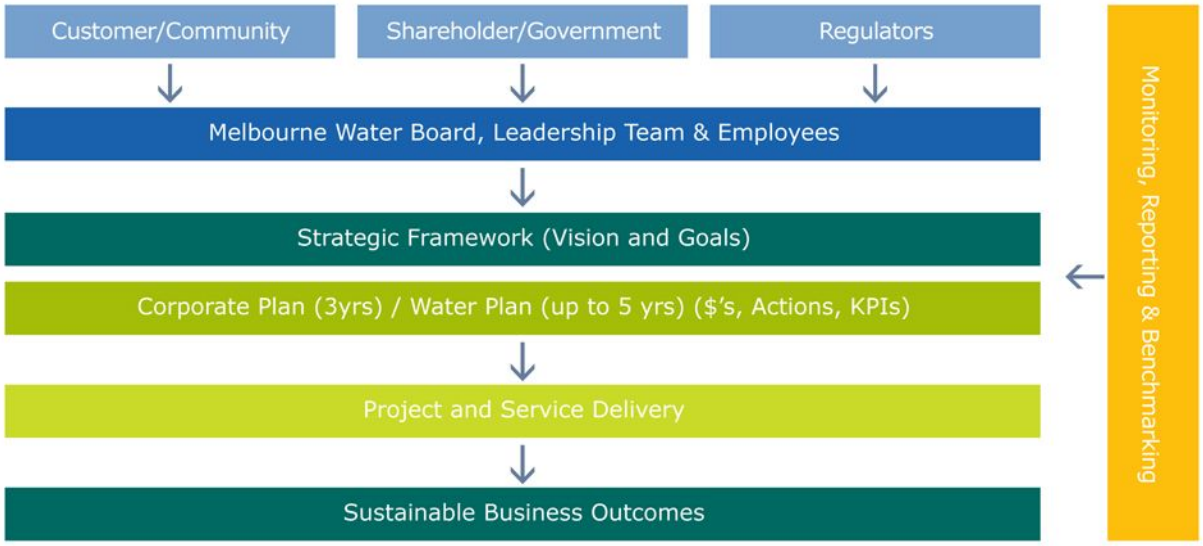
Melbourne Water's planning processes are integrated and robust and take explicit account of customer and stakeholder interests.

Melbourne Water's proposed outcomes and expenditure for the 2009 regulatory period have been developed through Melbourne Water's Planning Framework (Figure 9.1) which:

- Ensures alignment with State Government policy priorities, customer needs, regulator requirements and prudent risk management
- Ensures alignment between long term planning and day-to-day operational considerations
- Factors in broader economic, social and environmental considerations

- Achieves continuous improvement through regular benchmarking and review of planning processes and outcomes.

Figure 9.1: Melbourne Water's Planning Framework



Melbourne Water's vision, sustainability principles, values and goals are outlined in *Sustainable Water* - A *Strategic Framework*. This framework was developed in consultation with internal and external stakeholders and formalises Melbourne Water's commitment to sustainability. It also links Melbourne Water's programs to a range of State Government policy platforms including *Our Water, Our Future, Our Environment, Our Future* and *Melbourne 2030.* The Strategic Framework provides the context for Melbourne Water's planning process, ensuring that social, environmental and economic aspects are all considered.

The 2008/09 Corporate Plan and the 2009 Water Plan are consistent with the Strategic Framework, articulating strategies, actions and key performance indicators over a three-year planning period, as well as prices and expected regulated revenues for a four-year period respectively.

In 2007, Melbourne Water participated in a process to assess its sustainability performance against publicly listed companies considered to be world leaders in sustainability. The Sustainable Asset Management Group (SAM), which publishes and licenses the Dow Jones Sustainability World Indexes (DJSI), carried out the benchmarking survey. The SAM benchmarking compared Melbourne Water to global sustainability leaders on the basis of economic, environmental and social criteria.

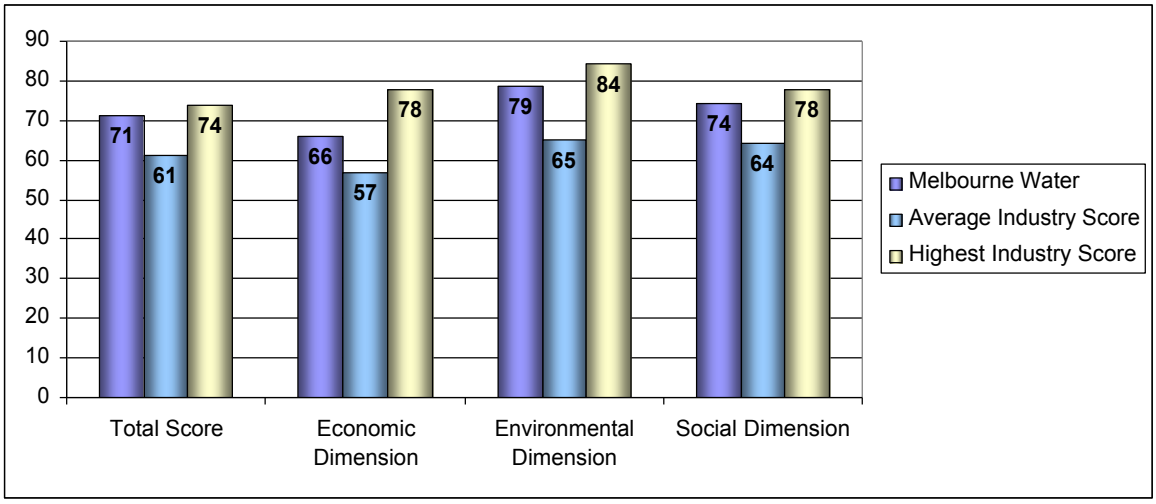
Melbourne Water performed well against global water utilities that are DJSI listed companies worldwide and Australian SAM Sustainability Index (AuSSI) listed Australia-wide companies (Figure 9.2 below).

The total Melbourne Water DJSI World score rose from 69% in 2005/06 to 71% in 2006/07, while the best scoring company increased from 70% in 2005/06 to 74%. This places Melbourne Water 3% behind the best global company in the water sector (the average score globally was 61%).

Against AuSSI peers, the total Melbourne Water score increased from 69% in 2005/06 to 71% in 2006/07, while the best scoring company rose from 73% in 2005/06 to 76% in 2006/07 (the average score was 37%).

Melbourne Water has considered the benchmarking results and is implementing a number of improvement measures.

Figure 9.2: Dow Jones Sustainability Indexes (DJSI) - global water utility comparison



The Board of Melbourne Water approves the Strategic Framework, the Corporate Plan and the Water Plan. The Managing Director and Leadership Team are responsible for delivering the outcomes in accordance with these plans. These outcomes are reflected in individual performance plans signed by management and staff.

9.2 Capital planning, including project planning, approvals and delivery

Melbourne Water's approach to capital planning is set out in its Planning Framework and Capital Investment Policy. This document defines the process, principles and accountabilities for developing the Capital Plan. The aim is for Melbourne Water to achieve its strategic objectives and manage risk though a policy and planning framework that optimises value for customers, the community and shareholders. The retail water businesses, as customers, are consulted during the planning process.

The Capital Plan represents the aggregated capital program. This is reviewed and prioritised by the Financial Management Investment Steering Committee for subsequent approval by the Board. These review and prioritisation considerations are informed by Program Plans, which represent a group of projects associated with a common system component (e.g. water transfer) or strategic objective (e.g. biosolids reuse) and form the building blocks for the Capital Plan. Program Plans summarise the key strategic considerations, performance obligations, risk assessment, long-term trends, prioritisation considerations and rationale for allocations to major programs.

The Planning Framework and Capital Investment Policy recognises the principal drivers of capital expenditures – growth, renewals, compliance and others which includes environmental/social, customer service, strategic intent/risk mitigation, business efficiency and business development. In particular:

- The growth component is developed through cooperative planning processes with the retail water businesses as provided for in the Bulk Water Supply Agreements and the Bulk Sewerage Transfer, Treatment and Disposal Agreements

- The renewals component is developed by adopting a risk-based approach that optimises lifecycle costs through maintenance, refurbishment and replacement of assets
- The compliance component is consistent with agreed customer service standards set out in schedules to the Bulk Water Supply Agreements and the Bulk Sewerage Transfer, Treatment and Disposal Agreements and regulatory obligations as set out by government in the Statement of Obligations and other specific legislation relating to drinking water quality and environmental obligations (e.g. sewage spills).

Regular review and continuous improvement are an integral part of Melbourne Water's Planning Framework. For example, since submission of the 2005 Water Plan, Melbourne Water has undertaken reviews and benchmarking studies with a view to strengthening its capital planning and delivery processes and systems:

- During 2005/06, a benchmarking study was undertaken with a leading United Kingdom water company with a specific focus on capital planning and delivery processes
- In June 2006 and September 2008, Melbourne Water engaged KPMG to review its capital planning and delivery process against industry 'best practice' to provide a basis for improving the process itself, including the systems and other factors that support it.

The results of these reviews are progressively being implemented and include strengthened governance arrangements through the establishment of a Board committee on capital planning and delivery. In addition, planning improvements include:

- A more rigorous program and project proposals review/challenge process
- An enhanced planning and approvals process based on business case gateways (see below) supported by a workflow system
- A streamlined planning and delivery process for low risk high volume works
- Improved cost estimation methodologies for high value/high risk projects
- Improved renewals planning and modelling to forecast future expenditures
- Introduction of Triple Bottom Line guidelines for evaluating expenditure proposals
- Progressive development of an improved project prioritisation process
- Increased emphasis on improved stakeholder engagement and relationship management.

Melbourne Water has also developed a Capital Delivery Strategy to address the issue of delivering a much larger capital program in a highly competitive contracting market.

Under the Capital Delivery Strategy, a project evolves through several planning and approval stages with gateways established for each step in the process. The four stages are:

1. Business Need Identifier
2. Preliminary Business Case
3. Functional Business Case
4. Business Case Approval.

The number of gateways the project is required to pass through depends on the scale and risk profile of the particular project being evaluated. Major (or high-risk) projects are required to complete each of the four-stages outlined above, whereas low risk projects proceed directly from Step 1 to Step 4.

Melbourne Water's Capital Project Planning and Delivery Guidelines, Triple Bottom Line Guidelines and the Investment Evaluation Model User Guide specify in detail the process to follow for developing project approvals and the methodology to be applied in project evaluation.

All projects use financial analysis to evaluate alternative solutions. Projects with capital expenditures greater than $1 million, and involving significant environmental and/or social effects, are subject to a Triple Bottom Line evaluation and assessment against a Community, Environment and Public Health Assessment (CEPHA) checklist to ensure broader environmental and social values are taken into account in decision-making.

Authorisation levels and delegations for approval are documented in Melbourne Water's Authorisation Levels Policy. Until recently, the Department of Treasury and Finance and the Department of Sustainability and Environment have approved the business case for all projects greater than $5 million. Recent advice from the State Government is that this limit will be increased to $50 million. Melbourne Water has subjected several high-risk projects to the Department of Treasury and Finance's Gateway Review Process to identify key issues in project planning and delivery.

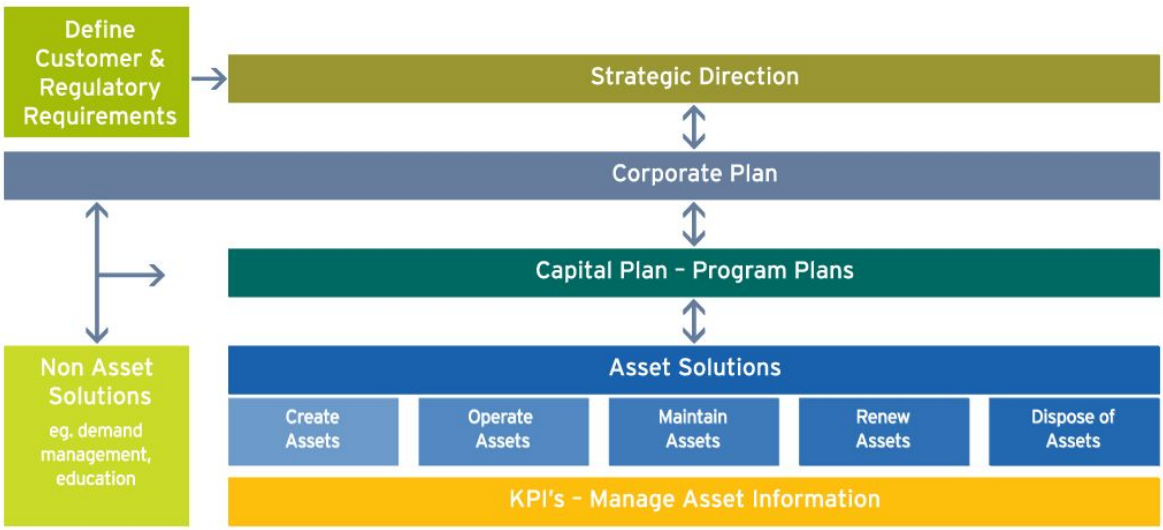
All projects satisfying Partnerships Victoria criteria (e.g. greater than $10 million and having clearly specified outputs, including measurable performance standards) are also considered in terms of the form of private sector involvement.

See Chapter 10 for further detail in relation to the Capital Delivery Strategy.

9.3 Asset management

Melbourne Water has a comprehensive Asset Management System that involves appropriate planning throughout the asset lifecycle. As shown in Figure 9.3, the Asset Management System links to the Corporate Plan and Strategic Framework.

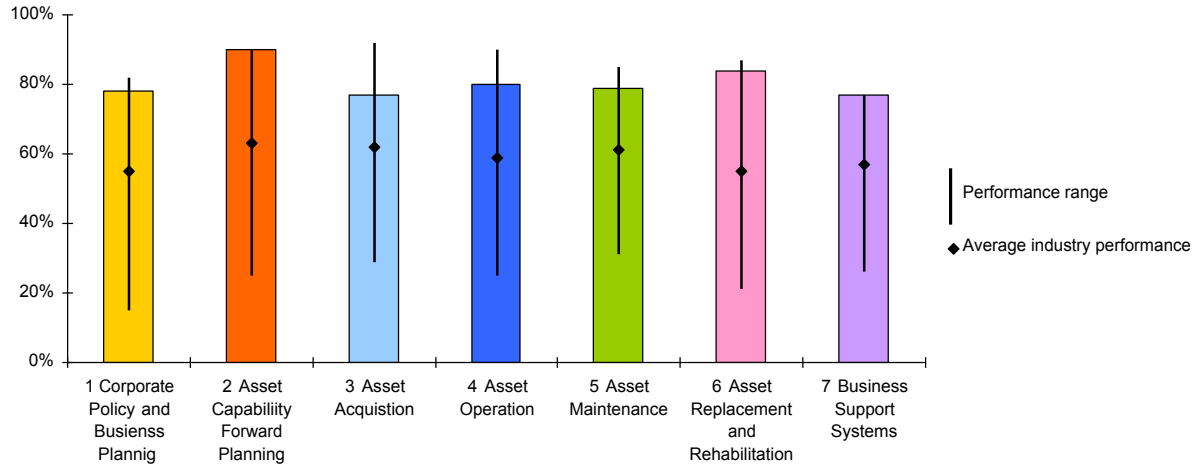
Figure 9.3: Asset management system



The Asset Management System achieves business performance targets for built assets using sustainable management principles. The Asset Management System comprises guidelines, management plans, processes and procedures, instructions and forms and is guided at the strategic level by the Asset Management Policy and Asset Management Strategic Framework.

The Asset Management System is independently audited every four years to assess current performance against Australian and overseas utilities and to identify improvement opportunities. The results of the 2008 WSAA audit reflect improvement measures implemented by Melbourne Water since the 2004 audit. Figure 9.4 illustrates the results of the 2008 audit and shows that Melbourne Water operates its asset management process at, or close to, best practice within the water industry, as was the case in 2004.

Figure 9.4: WSAA Asset Management Benchmarking 2008, Melbourne results summary



An annual Condition Assessment Report (know as the State of the Assets Report) summarises the condition of assets at a point in time. This feeds into the renewals program, asset specific management plans, operating manuals and maintenance schedules. The State of the Assets Report informs renewal planning in the short term (1 to 2 years) for civil, mechanical and electrical assets.

The State of the Assets Report is used to assess specific asset performance relative to levels of service as identified in the Strategic Asset Management Plans, including energy efficiency and maintenance frequency. Material deviations in levels of service (including average maintenance costs) will trigger a review of asset life cycle cost, which will then determine whether the asset should be repaired or renewed.

Longer term renewal planning (more than two years) for mechanical and electrical renewals varies in application depending on the asset class, but essentially uses historic asset performance and industry published data to model and predict asset life and therefore provide probabilistic replacement profiles for each asset class. Further detail is provided in Chapter 10. Civil works renewal planning is based on asset condition monitoring programs including, for example, remote camera scanning of underground assets.

The State of the Assets Report is regularly updated and presented to the Board.

9.4 Operating expenditure planning

Operating expenditure planning is undertaken within the context of the broader Melbourne Water strategic planning framework, *Sustainable Water – A Strategic Framework*. The planning process expands the Strategic Framework into more detailed action plans, e.g. Water and Sewerage Operating Plans, with related planning documents such as the Metropolitan Reuse and Recycling Plan detailed in section 9.8. This ensures that business structure, available resources and realistic timeframes are taken into account during operating expenditure planning. This planning process also draws on the Capital Plan for any associated operating expenditure impacts and involves a consultation process with the retail water businesses.

The Water and Sewerage Operating Plans detail the operational activities that Melbourne Water will undertake during the forecast period to achieve the broader strategic direction and outcomes identified in the Strategic Framework. For example, the Water Operating Plan ensures measures are in place to maintain acceptable water quality, quantity and reliability under normal operating conditions and, importantly, under drought conditions. These plans have direct links to demands, operating expenditure and revenue outcomes, taking into account long-term financial planning.

Planned operating expenditure is determined through a detailed submission and review process that draws upon:

- State Government policies including the CRSWS and the State Government's Water Plan
- Statement of Obligations
- Regulatory obligations
- Customer requirements
- External environmental impacts (political, legal, economic, social and environmental).

As indicated above, this is drawn together by the Program Plans which summarise the key strategic considerations, performance obligations, risk assessment, long-term trends, lifecycle costs, prioritisation considerations and rationale for allocations to major programs.

The principal document of the operating expenditure planning process is the Financial Operating Plan. This plan covers a four-year expenditure period (currently 2009/10 to 2012/13) capturing operating expenditure and revenue, and is reviewed by the Financial Management Investment Steering Committee.

Each business unit is responsible for development of future operational expenditure requirements. This approach ensures the business areas that spend the money are accountable for it through a budget and reporting process. Costs are classified against cost centres for specific projects (e.g. water quality and treatment expenditures associated with the reconnection of Tarago reservoir) or expenditure types (e.g. civil maintenance costs) to ensure appropriate ongoing monitoring of performance against plan. In an asset intensive industry like water, this approach has the advantage of aggregating the skills and expertise relating to specific asset classes ensuring:

- Identification of best practice processes and systems
- That service levels and quality outcomes are aligned with customer, stakeholder and regulatory outcomes
- Integration of capital and operating expenditure to ensure optimised overall expenditure levels.

Historical expenditure is an important consideration in determining future operating expenditure requirements. An understanding of historical trends and expenditure levels can significantly improve the understanding of likely future expenditures. Melbourne Water's operational expenditure planning process includes a system of checks and reporting frameworks that review historical expenditures against planned outcomes to ensure that variations are understood and justified. The review process includes an escalating review requirement based on the magnitude of the variation.

Melbourne Water recognises the need for continual efficiency improvement and undertakes benchmarking and performance review programs on a regular basis to identify emerging best practice, identify opportunities for improvement and set targets for improved performance. Details of the benchmarking and performance improvement initiatives are discussed above, as well as in Chapters 10 and 11.

9.5 Water resource planning

Water resource planning is a key input to both the capital and operating planning processes and has been a particular focus in preparing for the 2009 regulatory period given the current drought conditions.

Melbourne Water played a key role in assisting the State Government to prepare the CRSWS and the State Government's Water Plan. In these strategies and plans, the State Government committed to a wide range of actions to secure future potable water supplies for Melbourne, Geelong, Ballarat, the inner West and the Latrobe Valley, to secure irrigation supplies in the Goulburn Murray region and to improve river health.

Melbourne Water and the retail water businesses have also developed a Water Supply Demand Strategy, and a 2008 Melbourne Reuse and Recycling Plan, consistent with implementing the CRSWS and meeting the Statement of Obligations requirements. This includes a commitment to recycle 20% of Melbourne's wastewater by 2010 and to achieve potable substitution of 6.2 GL by 2015.

9.6 Sewerage planning

Sewage is increasingly being seen as a resource rather than waste for treatment and disposal. Currently, about 23% of the treated effluent from the Eastern Treatment Plant and the Western Treatment Plant is recycled, predominantly for irrigation purposes. The CRSWS commits to much greater local use of recycled water, particularly where this use can substitute for potable supplies. Tertiary treatment to improve the marine environment and produce Class A recycled water will be in place at the Eastern Treatment Plant in 2012. Melbourne Water's sustainability principles are also driving planning and implementation for the beneficial use of biosolids and production of renewable energy from sewage treatment processes. Sewerage planning needs to integrate the use of sewage as a resource with the continuing need to protect public health and the environment.

Melbourne Water and the three retail water businesses are jointly developing the Metropolitan Sewerage Strategy to ensure sewerage planning is integrated and optimised for the whole of Melbourne. Stage 1, completed in 2006, was a strategic sewerage issues review. Stage 2 examined priority issues and carried out an initial assessment of long-term drivers and scenarios. Stage 3 will involve joint detailed long term planning, appropriately interfaced with water resource planning, in the lead-up to the 2013 Water Plan.

9.7 Planning documents

The key planning documents are summarised below.

Strategic and Corporate Planning	• *Strategic Framework – Sustainable Water* • Corporate Plan
Capital Planning and Delivery	• Planning Framework and Capital Investment Policy • Capital Plan • Program Plans • The Capital Delivery Strategy
Asset Management	• Asset Management Policy • Asset Management System Framework • Independent audits of asset management processes • Condition Assessment Report
Project Planning Approvals	• Capital Management Processes and Procedures • Triple Bottom Line Guidelines • Investment Evaluation Model User Guide • Authorisation Levels Policy • CEPHA check list
Agreements and Schemes	• Bulk Water Supply Agreements • Bulk Sewerage Transfer, Treatment and Disposal Agreements
Operating Expenditure Planning	• Water Operating Plan • Sewerage Operating Plan • Metropolitan Reuse and Recycling Plan • Financial Operating Plan
Water Resource Planning	• *Our Water Our Future: the Next Stage of the Government's Water Plan* • *Central Region Sustainable Water Strategy* • *Melbourne Water Supply/Demand Strategy* • Drought Response Plan • Climate Change and Variability Adaptation Study • Metropolitan Joint Water Conservation Plan • Metropolitan Reuse and Recycling Plan
Sewerage Planning	• Metropolitan Sewerage Strategy

In the following chapters, Melbourne Water outlines its proposed capital and operating expenditures for the 2009 regulatory period which have resulted from undertaking the extensive planning process outlined in this chapter.

Chapter 10

Capital expenditure

Melbourne Water forecasts capital expenditure of $1.8 billion over the 2009 regulatory period.

About $1.1 billion (65% of the total) will be invested in four major projects directed towards implementing initiatives under *Our Water, Our Future; the Next Stage of the Government's Water Plan* (the State Government's Water Plan), the *Central Region Sustainable Water Strategy* (CRSWS), compliance with EPA Victoria's sewer spills and licence discharge requirements, and replacement of a critical ageing sewer. Three of these projects are under construction.

Investment in asset renewals has also increased the size of the capital program compared to previous years.

This larger capital program will be delivered efficiently by choosing contract and delivery strategies appropriate to the size, complexity and risk of individual projects (such as bundled delivery programs and incentivised alliance contracts). Improved working relationships with key stakeholders, increased internal project management resources and skills, and enhanced critical processes and IT systems will also ensure efficient delivery.

Melbourne Water also aims to maximise capital efficiencies and minimise lifecycle costs through innovative approaches to planning, design and delivery.

This chapter outlines Melbourne Water's proposed capital expenditure program over the 2009 regulatory period.

These forecasts are used to determine the revenue requirement in Chapter 13 and are based on obligations and demand forecasts described in Chapters 7 and 8. The forecasts have been developed through the planning framework, processes and strategies described in Chapter 9. Details of the top ten projects over the 2009 regulatory period are provided in Appendix 3.

10.1 Overview

Forecast capital expenditure for the 2009 regulatory period, in the context of actual expenditures, is illustrated in Figure 10.1.

As set out in Chapter 7, 8 and 9 the forecast capital expenditure requirements are primarily driven by:

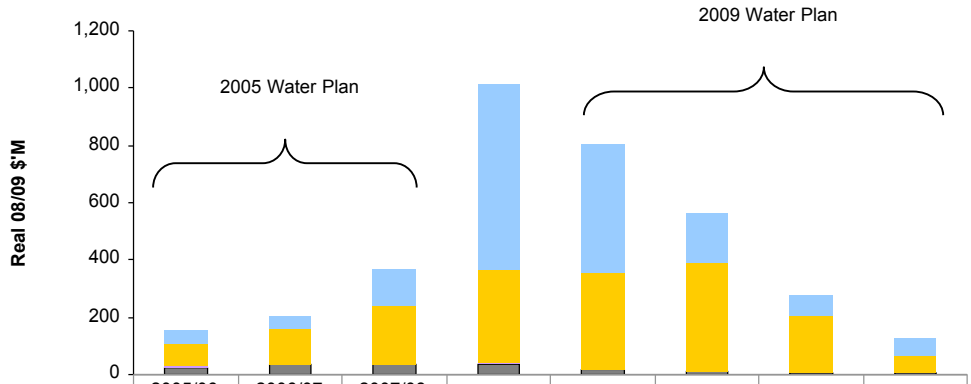
- Policy requirements set out in the State Government's Water Plan, the CRSWS and Melbourne Water's Statement of Obligations
- EPA Victoria requirements relating to sewage transfer, treatment and disposal
- Demand forecasts provided by the retail water businesses
- Asset condition/criticality assessments and predictive modelling which inform asset replacement decisions.

Key benefits of these expenditures will be the assurance of reliable, safe and affordable water supplies for households and industry, with sufficient reserves for future growth. With security of supply, Melbourne's economy and population will continue to grow. Sewerage treatment projects will improve the amenity of the receiving marine environment and provide new sources of recycled water, and the replacement of ageing sewers will protect public health and the environment through improved reliability while supporting a growing population.

The variable investment profile shown in Figure 10.1 is not unusual for bulk water and sewerage businesses (such as Melbourne Water). The variability is due to the size and 'lumpy' nature of significant projects and peaks caused by ageing assets. It is also driven by Melbourne Water's response to substantially different climatic conditions consistent with the State Government's requirements set out above.

Forecast capital expenditure assumes that the Victorian Desalination Project identified in the State Government's Water Plan is delivered by the Department of Sustainability and Environment as a PPP and therefore does not appear in the capital expenditure program.

Figure 10.1: Actual and forecast capital expenditure – 2005/06 to 2012/13

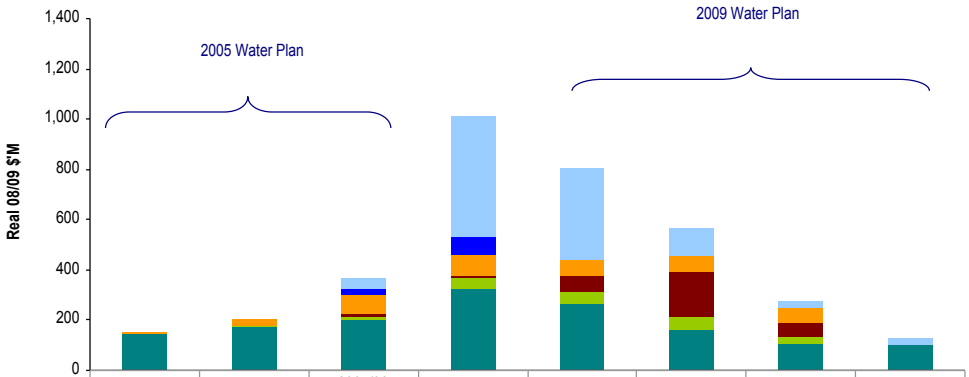


	2005/06 Actual	2006/07 Actual	2007/08 Actual	2008/09	2009/10	2010/11	2011/12	2012/13
Water	48.3	38.0	127.1	652.3	453.2	176.9	74.1	58.2
Sewerage	77.0	125.0	206.0	324.5	334.6	377.9	195.8	60.7
Recycled Water	4.8	2.0	0.4	0.6	0.2	0.3	0.2	0.3
Corp Allocated Overhead	24.3	36.9	34.9	38.6	17.5	9.3	7.3	8.0
Total	154.4	201.9	368.4	1,016.0	805.5	564.4	277.4	127.2

Planned investment over the 2009 regulatory period of $1.8 billion is higher than investment in recent years. The increase is primarily due to:

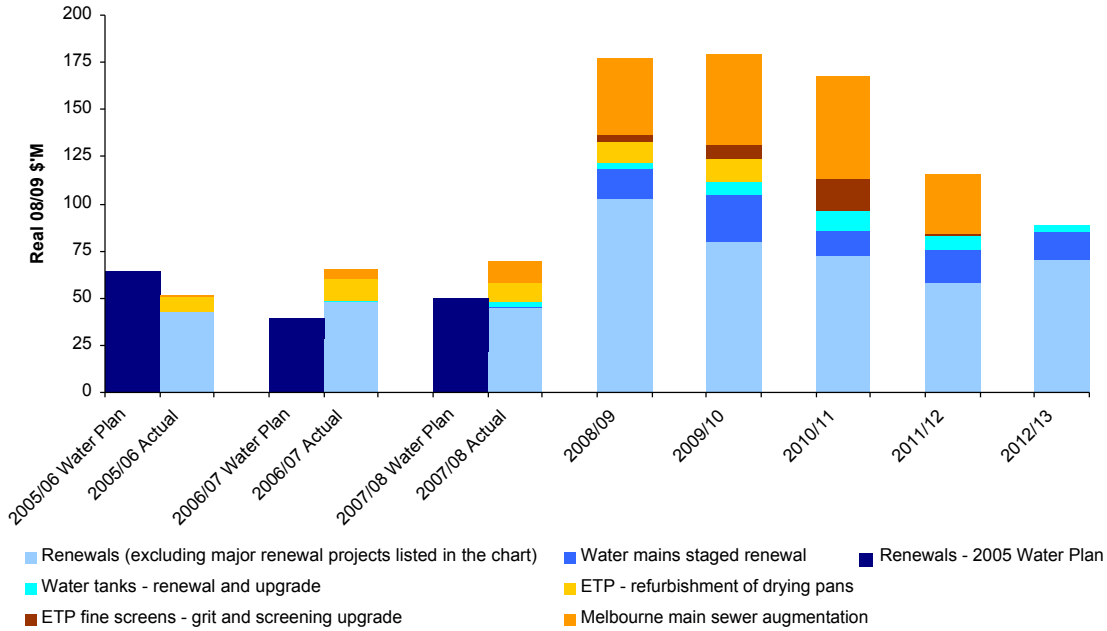
- Four major capital projects totalling $1.1 billion and accounting for approximately 65% of total planned expenditure (see Figure 10.2 below). Expenditures for these four projects have been profiled to meet obligations under the State Government's Water Plan (Sugarloaf Pipeline), the CRSWS and EPA Victoria licence and Works Approval requirements for the Eastern Treatment Plant (upgrade of Eastern Treatment Plant to tertiary treatment), compliance with EPA Victoria's sewer spills and licence discharge requirements (Northern Sewerage Project) and replacement of critical ageing infrastructure (Melbourne Main Sewer)
- By far the largest of these four projects is the Sugarloaf Pipeline project, which includes construction of the pipeline and pumping station, upgrade of the Winneke water treatment plant, upgrade of downstream transfer works and the contributions to the Food Bowl Modernisation Project. A significant proportion of the total expenditure on this project will be incurred prior to the commencement of the 2009 regulatory period
- Asset renewals of $551.3 million resulting from risk-based condition assessments and predictive modelling of future asset replacements beyond 2008/09. This renewals program is significantly higher than for the 2005 regulatory period, as shown in Figure 10.3 below.

Figure 10.2: Contributions of major projects – 2005/06 to 2012/13



	2005/06 Actual	2006/07 Actual	2007/08 Actual	2008/09	2009/10	2010/11	2011/12	2012/13
Sugarloaf Pipeline		0.1	41.6	479.3	364.1	112.0	26.0	20.0
Tarago water treatment plant		1.0	28.8	74.8				
Northern sewerage project	8.6	20.9	72.4	87.4	69.5	60.6	62.1	
ETP tertiary treatment		0.8	10.6	9.0	56.7	177.2	55.8	4.5
Melbourne main sewer augmentation	1.2	5.2	11.2	40.5	48.4	54.6	31.9	
Capex (excluding major projects)	144.6	173.9	203.8	325.1	266.8	160.0	101.6	102.7
Total Major Projects	9.8	27.9	164.6	690.8	538.7	404.4	175.8	24.5
Total	154.4	201.9	368.4	1,016.0	805.5	564.4	277.4	127.2

Figure 10.3 Asset renewals expenditure – 2005/06 to 2012/13



There are two key factors contributing to the increase in capital expenditure on renewals over the 2009 regulatory period.

Firstly, expenditure on asset renewals was underestimated in the 2005 Water Plan.

Renewals expenditure on mechanical and electrical assets was underestimated due to deficiencies in the predictive estimation tool used to forecast expenditures for the 2005 regulatory period. At the start of the 2005 regulatory period, Melbourne Water developed a new renewal planning process and model based on international industry best practice. The six step process draws on methodologies developed by:

- The United Kingdom Water Services Regulation Authority (Ofwat) requirement (Common Framework) for demonstration of economic levels of capital maintenance
- Yorkshire Water's response to the Common Framework
- Processes developed by the Commission for Victoria's electricity distribution businesses.

The model confirmed that a significant increase in expenditure on mechanical and electrical asset renewals was required.

Reflecting the results of this modelling, an accelerated asset renewals program commenced in 2006/07. Expenditure on asset renewals is forecast to peak in 2008/09 due to the carryover of projects from 2007/08, before stabilising at approximately $80 - $100 million per annum (excluding major renewal projects) over the 2009 regulatory period.

Expenditure on the renewal of civil assets generally reflected estimates included in the 2005 Water Plan.

Secondly, a small number of large, infrequent projects have boosted renewals expenditure for the 2009 regulatory period. These include augmentation of the Melbourne Main Sewer ($134.9 million), staged renewal of water mains from Preston to North Essendon and North Essendon to Footscray ($69.2 million), earlier than expected replacement of the corroded floors in steel service reservoirs at Yuroke, Sydenham, Cowies Hill and Dandenong North due to advanced corrosion ($28.9 million) and upgrade of grit and screens at Eastern Treatment Plant ($25.6 million).

Melbourne Water's proposed capital expenditure over the 2009 regulatory period is comprised of 175 active capital projects and allocations.

An allocation is a pool of capital expenditure that relates to a defined business need where planning has not yet progressed to the point where specific projects can be identified. Allocations account for $221.1 million (12% of total proposed capital expenditure) over the 2009 regulatory period and represents the largest percentage of total 'Other' expenditure for the latter years of the regulatory period. Expenditure on asset renewals accounts for a significant proportion of these allocations.

Melbourne Water develops and summarises its Capital Plan using programs and business drivers. Program Plans summarise the key strategic considerations, performance obligations, risk assessment, long-term trends and prioritisation considerations for major programs.

Figures 10.4 and 10.5 provide proposed capital expenditure over the 2009 regulatory period by product and by business driver respectively.

Figure 10.4 Capital expenditure by product – 2009/10 to 2012/13[81]

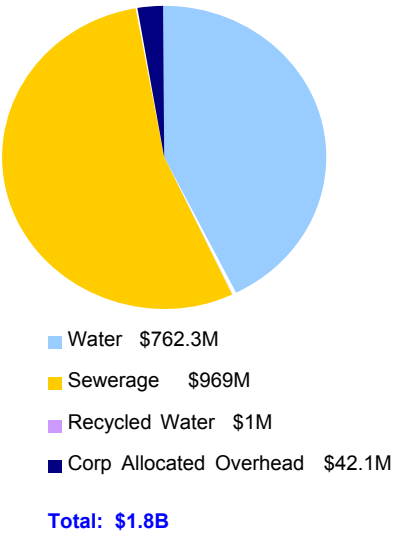
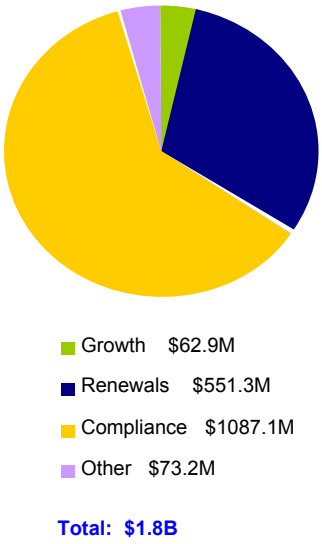


Figure 10.5 Capital expenditure by business driver – 2009/10 to 2012/13



The Water program accounts for the majority of compliance related capital expenditure. The Sewerage program is predominantly driven by compliance and renewals projects. See section 10.1.4 and 10.1.5 for further detail. The business driver 'Other' includes $9.9 million for the Sugarloaf and other mini hydros as well as many small projects.

10.1.1 New obligations and business as usual expenditures

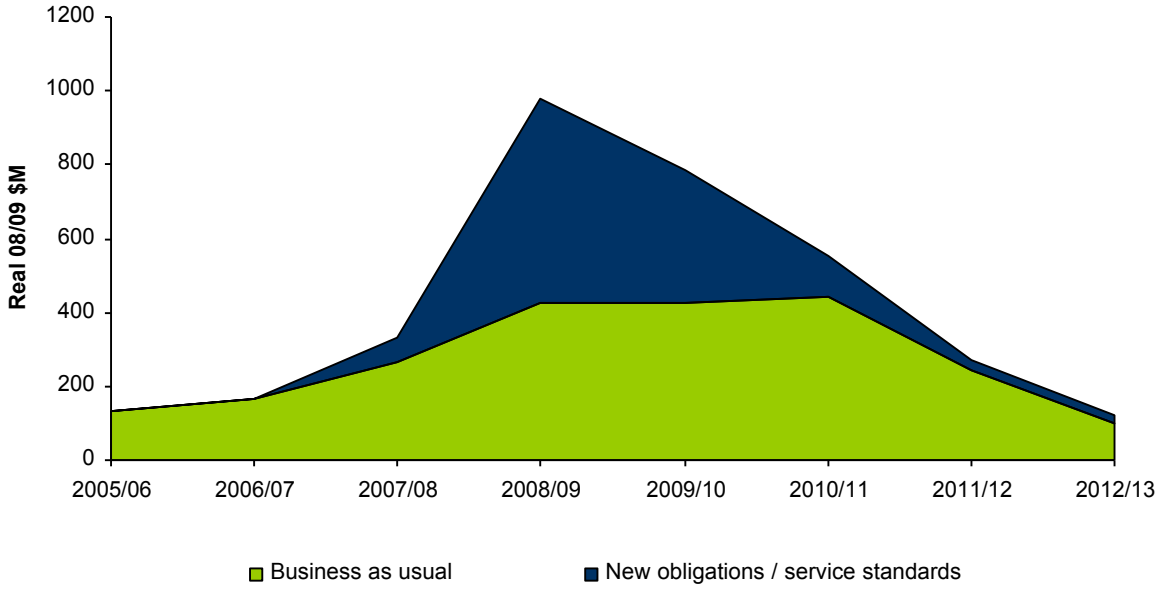
Figure 10.6 illustrates the profile of business as usual investments (71%) compared to investments required to comply with new obligations and service standards (29%) over the 2009 regulatory period.

As discussed in Chapter 6, the Commission has defined new obligations as those that come into effect from 1 July 2009. Melbourne Water considers that a supplementary approach is to identify new obligations which came into effect within the 2005 regulatory period and which were not included in the 2005 Water Plan.

New obligations coming into effect from 1 July 2005, and which were not included in the 2005 Water Plan, were outlined in Chapter 5. Over the 2009 regulatory period, capital expenditure on new obligations is $522.1 million for the planned construction of the Sugarloaf Pipeline to supply water to Melbourne from the Goulburn River and contributions to the Food Bowl Modernisation Project.

[81] While the Eastern Treatment Plant tertiary treatment upgrade is classified as sewerage expenditure, this project will also facilitate future water recycling opportunities.

Figure 10.6: Business as usual and new obligations capital expenditure – 2005/06 to 2012/13



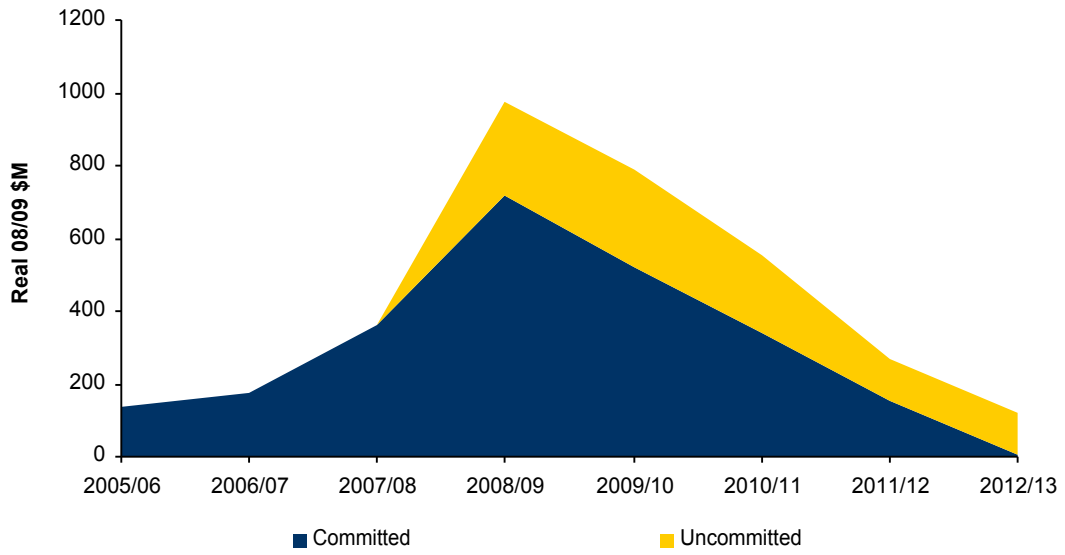
The decreasing trend in business as usual investment in the 2009 regulatory period is largely due to the completion of major projects: the Eastern Treatment Plant tertiary treatment upgrade, the Melbourne Main Sewer and the Northern Sewerage Project as well as a backlog of renewals work in 2009/10 and 2010/11 approaching longer term sustainable levels.

10.1.2 Approach to cost estimation

The Commission requires capital expenditure forecasts to be adequate in order to efficiently deliver the service levels required by customers and to meet all regulatory obligations. The accuracy of cost estimates in the Capital Plan varies for each project according to its maturity when the plan is formulated. Figure 10.7 shows the profile of committed projects (carryover projects from previous years, project approval following tender or business case approval, Target Outturn Cost[82]) compared to uncommitted projects (contingent on detailed design or pre-business case approval stage in the new capital management process).

[82] Target Outturn Cost is the expected final cost of a project.

Figure 10.7: Committed versus uncommitted projects – 2005/06 to 2012/13



Three of the four major projects have now progressed to construction. However, many of the other projects in Melbourne Water's Capital Plan are still at early feasibility and design stages, and are subject to the most variation while the project scope is defined, conditions are assessed and design innovations are considered. This means that variability in the cost estimates included in the Capital Plan in the short term (Years 1 and 2) is lower than in the medium to long term (Year 3 and onwards). Indicative ranges are given below.

In its 2005 Water Plan, Melbourne Water did not include contingency for projects in the Capital Plan without formal project approval because the compounding effect of contingency estimates in every project would overstate the budget required on an annual basis. This approach contributed to the under-estimation of capital costs on several major projects in the 2005 regulatory period, particularly with regard to the construction of sewers that required tunnelling.

To improve the accuracy of project cost estimates over the 2009 regulatory period, Melbourne Water has taken explicit account of project risk and uncertainty. Cost estimates for high value/high risk projects were developed using a consistent risk-based, probabilistic analysis. This analysis was applied to 'one-off' projects at the early feasibility and design stages with expenditures greater than $5.0 million.

A risk-adjusted cost estimate defines the range of costs for a project in probability terms, based on a rigorous assessment of the risks that might cause the actual costs to change when the project is implemented. A risk-adjusted cost estimate is developed by applying a risk factor (likelihood and consequence) against each significant 'raw' cost element of the project and then using a probabilistic analysis to combine the risk-factored cost estimates into a total project cost. The combined estimate is then expressed as a cost distribution with the most likely cost at the median (P50) and the extremes at the 5th percentiles (P5 and P95) on the distribution curve.

The statistical median for each high-value/high-risk project (P50) is included in the 2009 Water Plan. Accuracy levels are shown as a range between the upper (P95) and lower (P5) percentiles i.e. there is a 90% chance that the project final cost will fall within this range.

Examples of key project risks identified through this process include ground conditions (water pipelines and sewers), the price of steel (water pipes and tanks) and treatment process (upgrading Eastern Treatment Plant to tertiary treatment).

Accuracy levels for project estimates not developed using the risk-adjusted analysis reflect the different stages of planning:

- Investigation: +/- 30% to +/- 50%
- Functional design: +/- 30%
- Detailed design: +/- 10% to +/- 20 %
- Construction: +/- 5%.

In developing the Capital Plan, Melbourne Water also gave consideration to adjusting proposed capital expenditures to take account of differences between forecast increases in construction cost and the consumer price index (CPI). The retail water businesses and Melbourne Water jointly engaged independent economic forecaster, Econtech, to forecast movements in construction costs over the 2009 regulatory period (see Appendix 2).

Econtech's forecast of annual increases in construction costs for the various categories of work relevant to Melbourne Water are:

- Water distribution (pump stations, pressure reducing stations and large diameter pipelines above 300mm) – 5.7%
- Sewerage transfer (pump stations and large diameter pipelines above 300mm) – 3.2%
- Treatment (all facilities including recycling) – 2.8%.

This compares to Econtech's forecast CPI for Australia of 2.6% per year.

Melbourne Water considers that the principle of indexing capital expenditures for forecast increases in construction costs above CPI is important. However, it has not adjusted capital expenditures in the 2009 Water Plan, to help ensure its price increases are consistent with the State Government's pricing expectations that retail bills will no more than double by 2012/13. Melbourne Water may need to review this approach in responding to the Commission's draft decision and any comments on the capital program.

10.1.3 Capability to deliver large capital program

In its September 2008 *Supplementary Guidance on Water Plans*, the Commission indicated that it would consider the deliverability of the proposed capital expenditure over the 2009 regulatory period.

Melbourne Water recognises the significant challenge of delivering a much larger capital program on time and efficiently in a highly competitive contracting market. Construction activity around the world has grown rapidly in recent years in response to demand, putting pressure on costs and the procurement of resources and materials. The Australian water industry is also in a period of planning and construction of major water supply augmentation works, driven by long-term drought conditions.

Melbourne Water has considered this issue carefully and is confident of its capability to deliver the proposed capital program assuming the external environment, cost and resource availability reflects current expectations.

This is based on:

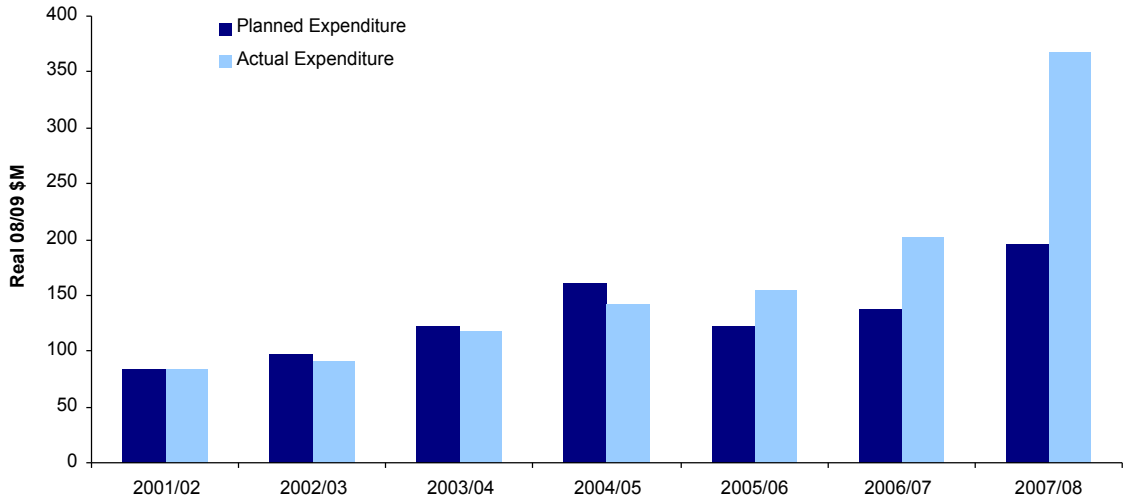
- Its consistent record of achieving planned capital expenditure over the past five years in which its capital program has almost doubled
- The composition of the capital program – four projects make up 65% of total planned expenditure over the 2009 regulatory period and 82% of planned expenditure for the major projects occurs over the first two years. Resource inputs for these projects have been secured and construction has commenced for three of these projects
- The proven ability of the market to increase supply in response to increased demand for engineering construction services
- The implementation of a Capital Delivery Strategy which involves:
  - Choosing contract and delivery strategies appropriate to the size, complexity and risk of individual projects. This has involved allocating capital projects to categories, e.g. major projects, bundled programs of medium sized projects and minor works. This enables economies of scale and scope to be achieved, which represent a sustainable business proposition to the market and ensure resources are retained to ensure delivery
  - Adopting a more collaborative approach to project delivery through the use of alliances which enable co-location and resource certainty – five program alliances have been mobilised and have commenced delivery
  - Close working relationships with key stakeholders to negotiate optimum solutions and timing for projects undergoing feasibility assessment
  - The establishment of an internal project control function to improve project scoping, scheduling and approvals for efficient and timely transition of projects from planning to construction
  - Increase in the number and skills of internal Project Managers while continuing to further identify the skills required to deliver the capital program and initiatives to attract and retain these requisite skills
  - Enhancing the processes and information technology systems that support the capital planning and delivery process e.g. the Capital Management System.

These points are discussed in more detail below.

Record of successful delivery

Figure 10.8 demonstrates Melbourne Water's successful track record in delivering its capital expenditure program in recent years. Over the past years, actual capital expenditure has more than doubled and exceeded expenditure allowed by the Commission in its 2005 Price Determination, by $269.2 million.

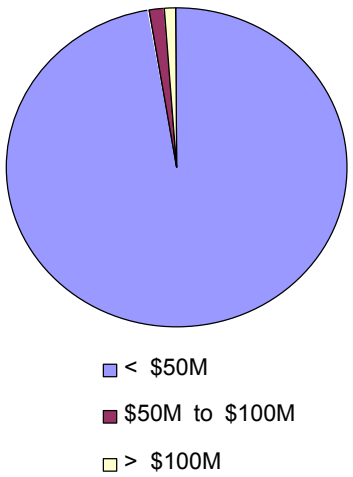
Figure 10.8 Planned versus actual expenditure – 2001/02 to 2007/08



Composition of capital program

Figure 10.9 illustrates the number of capital projects falling within various expenditure bands for the 2009 regulatory period. Four projects account for $1.1 billion (65% of planned capital expenditure), despite the large number of smaller projects.

Figure 10.9 Composition of capital program by number of projects – 2009/10 to 2012/13



Market Ability to Meet Demand

The challenge faced by Melbourne Water is to deliver an increasing complex and significantly larger capital program within a competitive market.

Data from the Australian Bureau of Statistics (ABS) shows that capital expenditure across Australia has increased significantly in recent years and this trend is forecast to continue. Further, Melbourne Water's increased investment is occurring simultaneously with increased capital expenditure by other major Australian urban water businesses in order to address water shortages. The expansion of water construction activity across all States is expected to place pressure on obtaining new resources with water industry specialisation. In terms of skills, those in highest demand are expected to include process (plant) design, estimating staff and project/site engineers.

The central plank of Melbourne Water's strategy to meet this challenge is effective partnering. Melbourne Water has offered the market a sustainable business opportunity, through the mobilisation of five program alliances.[83] This will assist in retaining key technical resources and provide an environment to respond to increased demand, with sufficient scale to obtain discounted margins locked in over the 2009 regulatory period.

In addition to an attractive, commercially sustainable and mutually beneficial offering to the market, other enablers consist of:

- A robust governance framework
- Organisation wide commitment
- Cultural change and development program
- Returns linked to outcomes aligned to Melbourne Water strategic goals.

In 2007, Melbourne Water consulted water and construction industry consultants and contractors on the significant capital expenditure it was proposing to deliver. The feedback indicated that the proposals are ambitious, but achievable, provided Melbourne Water approached the market early and used appropriate contractual models to secure resources. Melbourne Water has acted on this advice and developed and implemented its Capital Delivery Strategy, which includes the mobilisation of its program alliances and the commencement of works on major projects.

Contracting and delivery strategies

The Capital Delivery Strategy was developed recognising the variable nature of the proposed capital program for the 2009 regulatory period and the need for a flexible approach to delivery that can be scaled up or down. Under the Capital Delivery Strategy, the majority of project management and contract management is outsourced, providing flexibility and access to competitive processes to select specialised skills as required. Internal resources are focussed on capital program delivery and the development of delivery strategies.

[83] The 5 alliances are: Water, Sewage treatment and pump stations, Waterways, Pipelines (sewerage and drainage) and minor capital works.

To facilitate successful delivery of the program, Melbourne Water has developed and implemented a Capital Delivery Strategy based on a more collaborative approach which promotes efficient allocation of resources for project delivery. The following actions have been implemented under the Capital Delivery Strategy:

- Allocating capital projects to one of five categories for delivery, including through alliance mechanisms. These categories comprise major projects, bundled alliance delivery programs, bundled non-alliance delivery programs, minor works programs and miscellaneous programs
- Implementation of a new Capital Management System in July 2008 to greatly improve project reporting and tracking
- Implementation of a number of initiatives consistent with the businesses' Human Resources Strategy to restructure the existing capital delivery teams into the new delivery programs and alliance delivery structures
- Developing the capacity of capital delivery teams and other employees on alliance delivery and project manager expertise
- Consultation with the construction industry to clarify their expectations and understanding of the transition to the alliance and non-alliance delivery programs
- Encouraging efficient resource allocation, by apportioning project risks to parties best resourced and positioned to manage them
- Providing a suite of commercial incentives for parties to minimise costs, achieve key performance indicators and project objectives, and effectively manage risk
- Promoting cooperative behaviour to minimise disputes and therefore project costs and delays
- Continuing the current consultants' panel arrangements for non alliance projects and spreading the workload across a number of firms to underpin and assist the expansion of the water sector consulting industry in Victoria
- Underpinning the program with supporting Key Performance Indicators and performance targets to ensure projects (and programs) are delivered on time, on budget while achieving the benefits intended.

The delivery decision-making process undertaken by Melbourne Water is a function of a project's risk profile. For example, projects that are classified as high-risk by the Department of Treasury and Finance's Gateway Unit and/or fit the Partnerships Victoria classification will be run through Melbourne Water's delivery mechanism decision support tool. This determines the appropriate procurement strategy to deliver optimal resource allocation, risk apportionment and value for money outcomes. Through this delivery mechanism decision process, projects will either be tendered through an independent procurement approach or delivered by one of the four established program alliances (excluding minor capital works).

Capital Projects that do not trigger the Gateway or Partnerships Victoria requirements will also be delivered by the four program alliances or via the fifth alliance for high volume, low risk minor capital works. For minor capital works, Melbourne Water intends to transform its two main service providers for civil maintenance and mechanical and electrical maintenance, into an alliance to deliver both maintenance and minor capital works. At the same time, minor capital works will be streamlined to reduce project management overheads, freeing up this resource to improve the delivery of business as usual projects.

The emphasis of the delivery strategies is on adopting a commercial model that promotes value solutions to Melbourne Water and provides incentives for the proponents to deliver superior outcomes. The bundled alliance delivery programs will be supported by key result areas and key performance indicators to ensure projects and programs are delivered on time, budget and to the desired quality expectations.

Relationships with key stakeholders

Melbourne Water continues to work closely with relevant stakeholders to negotiate optimum solutions and timing for projects undergoing feasibility assessment.

To help expedite planning approvals for critical water resource projects, the State Government introduced the *Water (Critical Water Projects) Act* in December 2006. This legislation particularly assists projects requiring planning approvals and land acquisition.

For projects involving capital expenditure greater than $5.0 million, Melbourne Water is required to submit a business case for approval by the Department of Sustainability and Environment and the Department of Treasury and Finance. Melbourne Water has held discussions with these stakeholders with a view to streamlining the approvals process, including the possible lifting of the $5.0 million threshold for submission of business cases to better reflect the size of projects in Melbourne Water's capital program. In response to the Victorian Competition and Efficiency Commission's recommendations around reform of the metropolitan retail water sector, the State Government noted the Department of Treasury and Finance is reviewing this threshold, to be commensurate with the size of the business. Based on recent advice from the State Government, it is likely that Melbourne Water's threshold for project approvals will be increased to $50 million.

Establishment of governance arrangements

To achieve efficient, effective and timely planning, and delivery of the program, a governance framework has been established consisting of two teams – the Asset Investment Team and the Capital Governance Team.

The Asset Investment Team is accountable for ensuring projects are properly scoped, prioritised and have obtained necessary approvals in a timely manner to ensure delivery timeframes are achieved. The team ensures investments are prudent and align with organisational objectives, represent value for money and where opportunity exists, bundle projects to exploit efficiencies of scale and scope.

The Capital Governance Team is responsible for monitoring and control of the program, ensuring value for money is achieved through the delivery process and continued performance improvement. Activities undertaken to achieve these objectives include independent review (and approval) of project target costs and auditing of direct project costs and procedures. The team will also undertake technical and efficiency reviews from time to time.

Enhanced project management resources

The program alliances have secured a significant increase in available project resources (project managers and technical experts) for Melbourne Water to meet the challenge of a larger capital program. Following delivery of the larger components of the capital program, the surplus resources will be redeployed by the alliance partners to other activities.

Enhanced processes and systems

Melbourne Water has enhanced the processes and IT systems that support the capital planning and delivery process with Phase 1 of the new Capital Management System implemented in July 2008.

During the 2005 regulatory period, Melbourne Water engaged KPMG to review its capital planning and delivery processes in light of best industry practice. The improvement actions from this review and the preceding international benchmarking study with Yorkshire Water (completed March 2006) are being progressively implemented (refer to Chapter 9, section 9.2). A follow up review of the capital planning process was undertaken by KPMG in 2008 to identify further efficiencies and opportunities for improvement to incorporate in Phase 2 of the Capital Management System.

The new capital management IT system enhancement and upgrade, once fully embedded, will considerably improve the effectiveness and efficiency of project planning, monitoring and control processes. It will also improve project reporting mechanisms.

10.1.4 Water

Planned water investments total $762.4 million (approximately 43% of total proposed capital expenditure) over the 2009 regulatory period. Figure 10.10 summarises the major drivers of investment for water during the 2009 regulatory period. Figure 10.11 shows historical and proposed expenditure by program.

Figure 10.10: Water capital drivers – 2009/10 to 2012/13

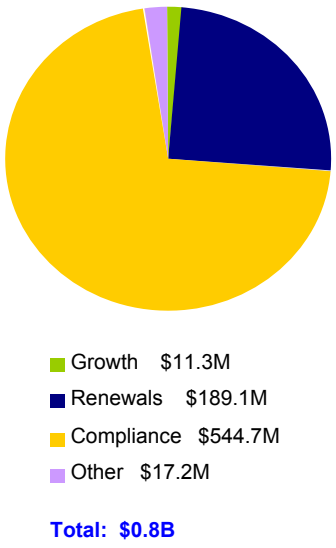
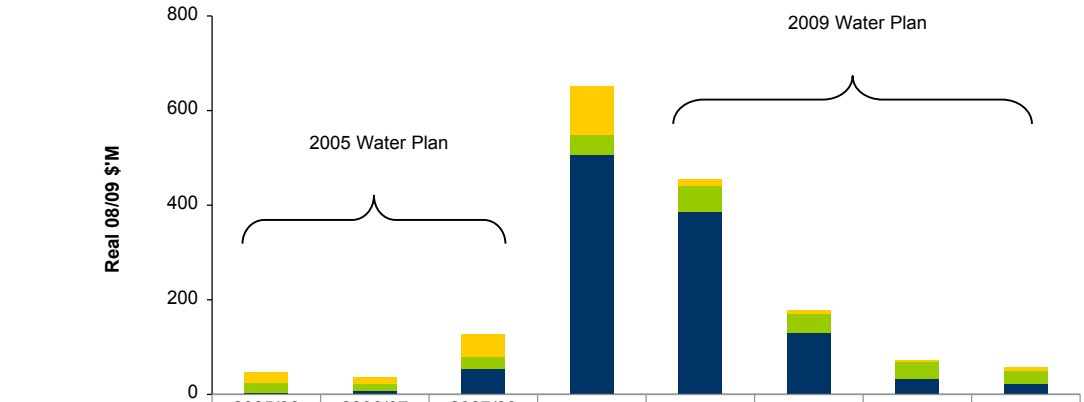


Figure 10.11: Water capital expenditure – 2005/06 to 2012/13



	2005/06 Actual	2006/07 Actual	2007/08 Actual	2008/09	2009/10	2010/11	2011/12	2012/13
Water Quality	21.7	15.6	47.1	103.0	14.1	6.3	6.6	7.4
Water Transfer	22.3	14.2	26.5	43.2	54.3	40.4	34.5	27.5
Production & Storage	4.3	8.2	53.5	506.2	384.8	130.2	33.0	23.3
Total	48.3	38.0	127.1	652.3	453.2	176.9	74.1	58.2

Recent investment in water infrastructure has been low compared to sewerage, reflecting the success of demand management programs in reducing aggregate and peak day water demands and deferring major investments in supply augmentation and transfer capacity.

However, significant investment is planned over the 2009 regulatory period due to continuing drought and low water storage levels consistent with the State Government's Water Plan and the CRSWS. This includes completing construction of a pipeline from the Goulburn River to the Sugarloaf Reservoir by early 2010 ($317.1 million) and continued contribution to the Food Bowl Modernisation Project for water efficiency savings ($205.0 million). This is a new obligation.

In regard to business as usual investment, significant asset renewals are planned including the replacement of 100-year old cast iron water mains in the Essendon area ($69.2 million), the upgrade of a number of steel water storage tanks to address corrosion of the floor plates ($28.9 million) and the construction of a new outlet structure and outlet pipe at O'Shannassy Reservoir ($10.4 million).

10.1.5 Sewerage

Planned sewerage investments total $969.0 million (approximately 55% of total proposed capital expenditure) over the 2009 regulatory period. Figure 10.12 summarises the major drivers of investment for sewerage during the 2009 regulatory period. Figure 10.13 shows historical and proposed expenditure by program.

Figure 10.12: Sewerage capital drivers – 2009/10 to 2012/13

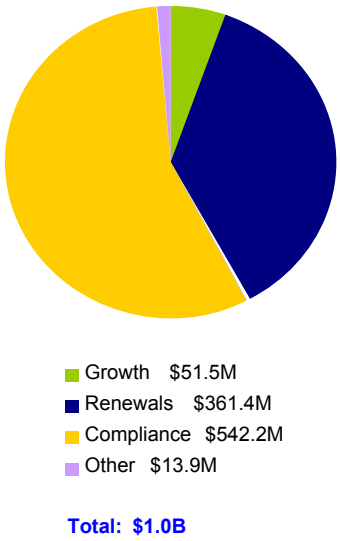
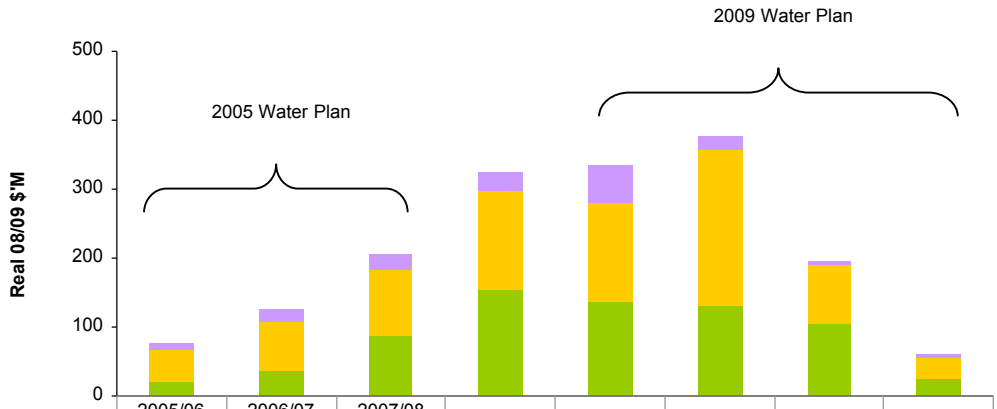


Figure 10.13: Sewerage capital expenditure – 2005/06 to 2012/13



	2005/06 Actual	2006/07 Actual	2007/08 Actual	2008/09	2009/10	2010/11	2011/12	2012/13
WTP	10.3	17.4	22.6	27.8	54.4	19.5	6.6	6.0
ETP	46.5	70.7	95.1	141.9	143.0	227.2	83.2	28.6
Sewerage Transfer	20.2	36.9	88.4	154.9	137.2	131.2	106.1	26.1
Biosolids	-	-	-	-	-	-	-	-
Total	77.0	125.0	206.0	324.5	334.6	377.9	195.8	60.7

Compliance is the primary driver for sewerage services with significant investment planned to reduce sewage spills in the transfer system and upgrade the level of treatment and disposal at Eastern Treatment Plant and Western Treatment Plant. The reduction of the biosolids inventory at Western Treatment Plant is contingent on the outcomes of technical trials and negotiation of commercial arrangements for a waste to energy project. Due to this uncertainty the project has been excluded from the capital program.[84]

Key projects over the 2009 regulatory period include:

- Sewer spill abatement works in the transfer system to meet EPA Victoria requirements, including the Northern Sewerage Project ($192.2 million)[85]
- EPA Victoria licence compliance works at the Eastern Treatment Plant, including the upgrade to tertiary treatment ($294.1 million)[86] and odour reduction ($23.0 million)
- EPA Victoria licence compliance and growth works at the Western Treatment Plant, including the wet weather capacity upgrade ($42.8M).[87]

Asset renewals are also a driver of increased expenditure. Key projects include:

- Replacement of the Melbourne Main Sewer ($134.9 million)
- Upgrade of the grit and screenings removal facility at the Eastern Treatment Plant ($25.6 million)
- Replacement of aeration blowers at the Eastern Treatment Plant ($18.3 million)
- 55 East cover replacement and associated works at the Western Treatment Plant ($16.2 million).

These projects have been classified as business as usual in that they meet existing standards but highlight the lumpy nature of Melbourne Water's investment program.

[84] As noted in Chapter 6, if this project occurs during the 2009 regulatory period it is proposed that prices would be reopened.

[85] The Northern Sewerage Project has dual drivers in compliance and growth, but for the purposes of the 2009 Water Plan it is classified as a compliance project.

[86] The tertiary treatment upgrade is not only a compliance driven project; it is also consistent with the State Government's Water Plan and the CRSWS to facilitate increased water recycling opportunities in the future.

[87] The wet weather capacity upgrade project has dual drivers in compliance and growth but for the purposes of the 2009 Water Plan it is classified as a growth project.

10.1.6 Recycled Water

Planned recycled water investments total approximately $1.0 million over the 2009 regulatory period. This investment is for the renewal of ageing mechanical and electrical equipment associated with the recycled water production quality plant and to improve the reliability of recycled water at the Western Treatment Plant.

10.1.7 Corporate

Planned corporate investments total $42.1 million (2% of total proposed capital expenditure) over the 2009 regulatory period. The majority of corporate investments are associated with business as usual activities such as information technology, replacing hardware and software to maintain current levels of performance. In addition, expenditure on the Sugarloaf mini-hydro and six other mini-hydros have been classified as corporate expenditures. It is proposed that these projects are treated as part of 'regulated' corporate business to reflect a change in the way the power generated from the mini-hydros is used by Melbourne Water. Previously, existing mini-hydros have been considered part of Melbourne Water's 'unregulated' business, as noted in Chapter 6 and 15.

10.1.8 Projects carrying beyond the 2009 regulatory period

There are a number of major projects with expenditure that carries beyond the 2009 regulatory period. Table 10.1 indicates the extent of commitment carried on into the 2013 regulatory period.

Table 10.1: Projects carrying beyond the 2009 regulatory period

Project Name	2009 Water Plan ($ M)	Beyond 2009 Water Plan ($ M)
Water		
North Essendon – Footscray mains renewal	32.2	8.6
St Albans-Werribee pipeline Stage 2	2.1	36.0
Sugarloaf Pipeline	522.1	10.0
Sewerage		
Eastern Treatment Plant aeration blower replacement	18.3	9.5
Eastern Treatment Plant outfall extension*	2.2	288.5
Hawthorn main sewer wet weather upgrade	1.3	14.1
North Yarra Main Sewer relining / duplication	17.9	21.4
Kew North branch sewer upgrade	0.7	7.2
Total	**596.8**	**395.3**

* Subject to a decision in 2009 on the most effective treatment process at the Eastern Treatment Plant (following the tertiary treatment trials) which will include consideration of whether to extend the existing Eastern Treatment Plant outfall.

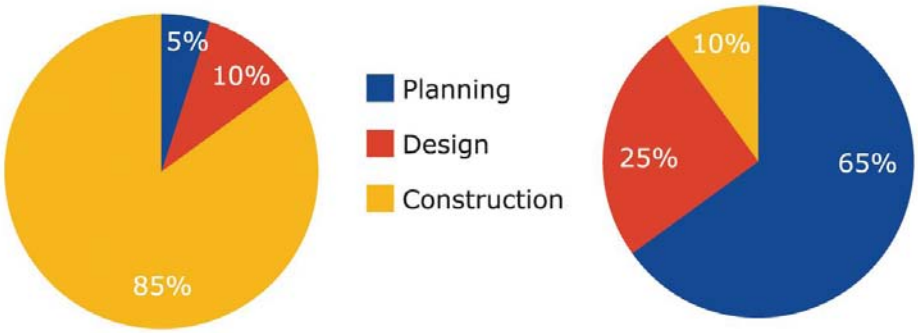
This list highlights the nature of Melbourne Water's capital program, which requires large infrastructure that can take several years to complete.

10.2 Efficiency gains and initiatives

Melbourne Water is a capital-intensive business. The majority of opportunities to achieve efficiency gains are captured through the planning process by focussing on strategies to achieve cost-effective solutions for capital and operating expenditure.

Engineering studies of investment in water infrastructure have analysed opportunities for achieving capital efficiency by comparing actual project expenditure to the factors which influence final project cost. Figure 10.14 shows how the planning stage offers the most significant opportunity to influence final project cost. The delivery stage represents the majority of project expenditure. However, innovations at this stage have the least influence on final project cost.

Figure 10.14:
Actual project expenditure **Influence on final project cost**



The **planning stage** in the capital process identifies needs, potential solutions, scope, relative priority and timing of projects. Innovative solutions, clear scope and prioritisation will have the most significant impact on costs.

The **design stage** includes the detailed definition and design for projects. Project design is carried out by a collaborative alliance process (set up via competitive engagement processes) or contracted out through competitive tender processes. Emphasis is placed on maximising value from investments through processes such as value engineering studies at the early stages of project planning and design and by incorporating learnings from post-implementation reviews.

The **delivery stage** in the capital process includes materials purchase and construction of assets. Effective project management, program bundling to achieve economies of scale, incentivised commercial arrangements through alliances and Cost Reimbursable Performance Incentivised (CRPI) delivery models, contract management and strategic purchasing arrangements can all improve capital efficiency at the delivery stage.

The following section discusses Melbourne Water's approach to achieving efficiencies in planning, design and delivery of assets, and gives examples of where significant savings have been, and will continue, to be achieved.

10.2.1 Planning

The opportunity to influence capital efficiency through planning and prioritisation will depend on the project driver and stakeholder requirements. Table 10.2 describes Melbourne Water's prioritisation considerations and stakeholder involvement in the planning process. Managing risk is an integral part of the efficiency equation, measured through the probability and consequence of not doing, or deferring investment.

Table 10.2: Planning and prioritisation considerations

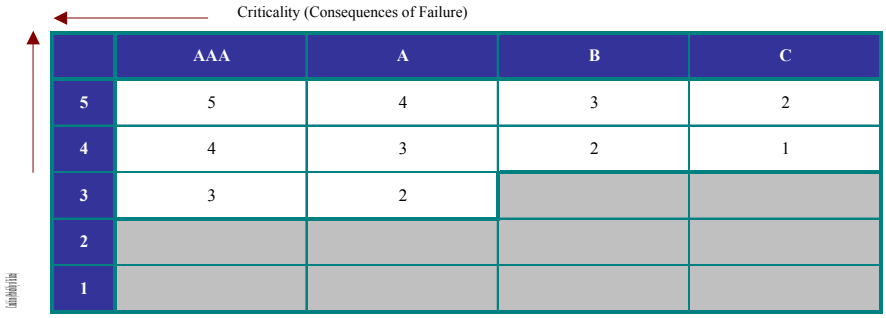
Driver	Planning and prioritisation considerations	Stakeholders
Meeting existing services standards	**Not if but when**	
Renewals	• Maintenance opportunities optimised? • Consequences of deferral (residual risk)	• Internal • Retail water businesses
Growth	• Can demand/peaks be influenced? • Consequences of deferral (residual risk)	• Retail water businesses
Meeting new services standards	**Do we have to do it? If so, when?**	
Compliance	• Can timing/standard be negotiated? • Consequences of deferral (residual risk)	• Technical regulators
Other	• Can it demonstrate positive efficiency gains? • Will it meet environmental and social strategic objectives? • Will it mitigate risk? • Is the community willing to pay?	• Community • Board

The following examples show how significant long-term savings can be achieved at the planning stage using these prioritisation considerations.

Renewals

Melbourne Water conducts a comprehensive condition assessment as part of its asset management planning. This is reflected in a Condition Assessment Report prepared each year making planning for renewals timely, targeted and relative to other priorities. The risk matrix (Figure 10.15) used by Melbourne Water is consistent with Australian Standard AS4360 and best practice for risk management. Projects with high likelihood and consequence of failure are prioritised.

Figure 10.15: Risk management matrix



Growth

Demand management programs including user pays pricing, education and regulation have reduced aggregate and peak water consumption, and deferred the need for investment in costly infrastructure to meet peak demands.

Waste minimisation strategies, developed with trade waste customers by the retail water businesses, are assisting in reducing the growth in pollution loads at sewerage treatment plants. For example, City West Water's cleaner production program targeting salt has decreased loads and, over time, is expected to reduce impacts and potential future treatment costs at the Western Treatment Plant.

Case Study:
Review of the Maribyrnong Sewer catchment strategy

Melbourne Water in conjunction with City West Water completed a review of the strategy to meet EPA Victoria's wet weather spill compliance requirements and population growth in the Maribyrnong Sewer catchment. The previous strategy proposed a major augmentation of Melbourne Water's sewer by 2010 at a capital cost of about $14.4 million. Following refinements to the model used to assess options and growth assumptions, the strategy proposed a lower cost first stage comprising a $4.0 million detention tank constructed by City West Water in 2007, and a $5.4 million pumping station as a second stage by Melbourne Water in 2020. The revised strategy has resulted in a capital cost saving of about $5.0 million with potential to further defer Stage 2 works. The review highlights the benefits of the Melbourne water industry's joint planning process in delivering integrated and cost effective solutions.

Compliance

Melbourne Water undertakes major research to inform decisions by regulators on environmental and drinking water standards. It also invests in monitoring and modelling to develop cost-effective solutions for meeting standards.

Compliance can be costly and often requires the application of evolving technologies. Melbourne Water remains abreast of international developments and technology transfer through membership of international water associations and participation in international study tours relevant to Melbourne Water's regulatory issues.

Case Studies:
Recent research used to influence effectiveness of standards

Eastern Treatment Plant/Boags Rocks environmental studies (1997-2007)
A total of $3.5 million has been spent on these studies which have used leading edge science to assess the environmental, aesthetic and public health impacts of the Eastern Treatment Plant effluent discharge at Boags Rocks. The outcome of these studies shows Melbourne Water now has a very good understanding of both the causes and the extent of the impacts. This will result in greater certainty in the environmental outcomes resulting from the management and treatment options ultimately selected. Given the very high cost of the potential options, major savings in both capital and operating expenditure will be achieved. In particular it may be that an ocean outfall, which has a current estimated cost of $290.7 million, and which does not facilitate water recycling, may no longer be required.

Examples of investigations being undertaken through monitoring and modelling to reduce costs, or improve targeting of resources, in future planning include:

- Odour monitoring and modelling at the Western Treatment Plant to assist in preparing a risk management strategy and developing efficient capital works
- Monitoring and modelling was used to underpin the design of the ammonia reduction works at the Eastern Treatment Plant, including the new aeration tanks currently being constructed.
- Similarly for tertiary works at the Eastern Treatment Plant, extensive monitoring and testing is informing the most efficient way of treating effluent to tertiary standards and minimising life cycle costs.

10.2.2 Design

Melbourne Water has typically out-sourced its design work through competitive tendering processes. Value is maximised at the design stage through design processes and contracting arrangements that provide incentives for innovation (captured through the Value Engineering process), and minimise lifecycle costs while capturing learnings from past experience.

Melbourne Water has appointed a panel of eight engineering consultants through a tender process. Design projects are assigned based on relevant individual experience and skill. A formal annual performance evaluation is conducted for each firm on the panel to identify opportunities that enhance innovation and improve value.

Design process and contract incentives

Melbourne Water is increasingly using relationship agreements for large investments to improve project deliverables and reduce lifecycle costs. Compared to traditional lump sum contracting, relationship agreements:

- Allow Melbourne Water to better manage risk and scope changes
- Provide commercial incentives for parties to minimise costs and achieve key performance indicators
- Discourage disputes by encouraging cooperative and collaborative behaviour, and effective management of resources and efficient allocation of risk.

Case study:
Tarago water treatment plant

This project is near completion of the construction phase. In its design phase, it was determined that the elevation of the plant and the choice of treatment technology was central to providing the best value for money solution. By constructing the plant at the best possible elevation, significant reductions in pumping costs could be achieved. In considering inflow water quality, it was determined that Dissolved Air Filtration Flotation (DAFF) technology would provide the requisite treated water quality at a lower lifecycle cost. It was also found that for extended periods of time water quality in the reservoir is very good and that, under certain circumstances, full treatment is not required. The project is predicted to be delivered six months ahead of schedule. The design of the main water storage tank, using concrete rather than steel, has saved in excess of $1 million and 3 months construction time.

Large capital projects using relationship agreements during the 2009 regulatory period include the Sugarloaf Pipeline, the Eastern Treatment Plant tertiary treatment upgrade, the Northern Sewerage Project and the Melbourne Main Sewer Augmentation. This type of arrangement has been shown to be effective particularly for large projects with uncertainties and potential risks that may otherwise result in significant costs being allocated for potential risks in a lump sum contract.

Post implementation reviews and adaptive management

Post Implementation Reviews are conducted for projects greater than $1.0 million, projects over budget, or where potential for learning has been identified. A summary of key learnings is reported annually to Melbourne Water's Board and is shared with relevant planning and operational people to ensure the transfer of learnings.

Examples of key changes adopted since the last annual review include:

- Adopting risk methodologies when estimating project cost
- Improved stakeholder management and approaches to achieving statutory approvals processes
- Promoting co-location of project teams.

10.2.3 Construction

The opportunities to capture capital efficiencies at the delivery stage include delivery costs minimised through effective project management and contract management.

Project management

As stated above in Section 10.1.3, the bundled alliance delivery programs have secured for Melbourne Water a significant increase in available project resources (project managers and technical experts) to meet the challenge of delivering a larger capital program. Internal resources will be focussed on the project initiation stage and development of delivery strategies.

Melbourne Water's standard contracting arrangements prioritise issues such as safety, industrial relations and environmental management to avoid risks and adverse public perceptions associated with these delivery issues. These benefits are real but difficult to quantify as savings.

Strategic purchasing

Strategic purchasing contracts have been identified where it is more cost-effective for Melbourne Water to undertake purchasing of equipment outside of individual contracts. The purchase of pipes is a good example where Melbourne Water will analyse the forward capital program enabling opportunities to purchase in bulk or at optimum time e.g. the forward purchase of steel water mains for the Sugarloaf Pipeline.

Chapter 11

Operating expenditure

Melbourne Water's planned operating expenditure totals approximately $1.4 billion over the 2009 regulatory period.

Forecast operating expenditure is increasing as a result of the costs associated with meeting new regulatory obligations, meeting existing obligations and maintaining an asset base that is expanding in size and complexity. Higher industry wide costs are also driving increased operating expenditures.

Forecast operating expenditure includes initiatives to reduce costs and improve service performance.

This chapter outlines Melbourne Water's proposed total operating expenditure[88] over the 2009 regulatory period, the primary drivers of planned increases and proposed initiatives to achieve efficiency savings. The expenditure forecasts are based on the obligations and demand forecasts described in Chapters 7 and 8 and are used in determining revenue requirements in Chapter 13. The forecast expenditure has been developed through the planning processes and strategies described in Chapter 9 and is consistent with the proposed capital expenditure in Chapter 10.

11.1 Background

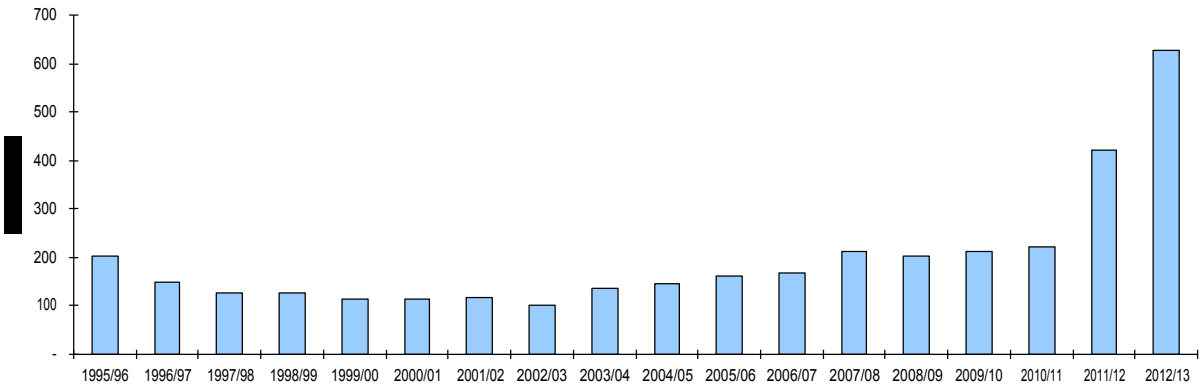
Melbourne Water has achieved significant efficiency savings since the metropolitan water industry was disaggregated in 1995. These savings have been achieved despite an increasing asset base and with growing State Government, regulatory and customer requirements.

As illustrated in Figure 11.1, Melbourne Water steadily reduced its operating costs over the period 1995/96 to 2001/02. Since then, operating expenditure has been slowly increasing, but will experience a significant increase at the end of the 2009 regulatory period as a result of the payment obligations associated with the Victorian Desalination Project.

Factors that contributed to the initial reductions up until 2001/02 include increased competitive tendering as a result of outsourcing activities to the private sector, streamlined business processes and resource use, enhanced business systems, applying research and technological developments, and savings through contract renegotiations.

[88] Total operating expenditure includes operating, maintenance and administration costs.

Figure 11.1: Actual and Forecast Operating Expenditure – 1995/96 to 2012/13 [89]



Since 2001/02, Melbourne Water has continued to implement initiatives to reduce operating costs while maintaining service quality. These savings, however, have been offset by cost increases that are due largely to external factors, including:

- New legislative and regulatory changes, particularly over the 2005 regulatory period
- Increased operational costs associated with running a water supply system in drought conditions and further population growth. Drought has also seen higher expenditure on managing the risk of fire in Melbourne's water supply catchments
- Increases in energy costs associated with new sewage treatment processes at the Western Treatment Plant and the Eastern Treatment Plant to meet higher EPA Victoria environmental requirements
- Increases in the quantity and unit cost of maintenance activities, reflecting changes in the size and composition of Melbourne Water's asset base
- Increased emphasis on sustainability considerations and triple bottom line outcomes.

While most of these external factors will continue to drive cost increases over the 2009 regulatory period, Melbourne Water will continue to focus on improving its operating efficiency by undertaking the initiatives discussed in Section 11.4. These include contracting out about 78% of direct operating expenditure to the private sector consistent with Melbourne Water's Planning Framework and Contract Strategy. This strategy aims to ensure that:

- Capital and operating costs are considered together to minimise life cycle costs
- Appropriate incentive arrangements are in place to align Melbourne Water and service provider objectives to promote improvements in service quality and reduce costs
- Strategic purchasing and bundling of inputs are considered to reduce total operating costs
- The mix of internal service provision versus externally contracted services is reviewed periodically and optimised
- Use of alliance arrangements with the private sector to deliver Melbourne Water's capital program.

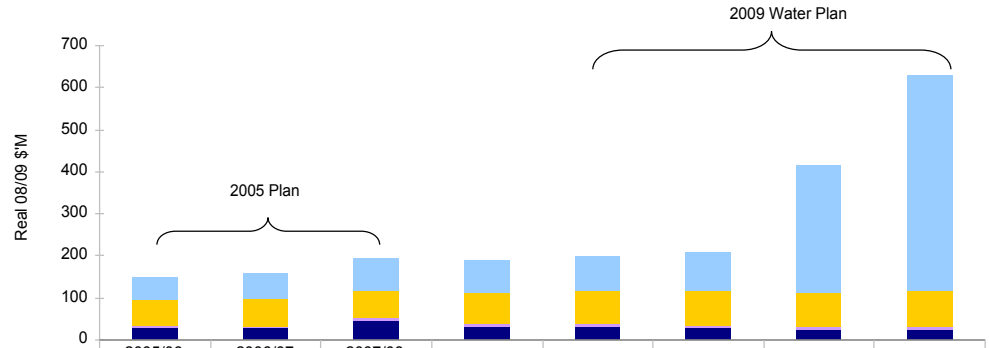
[89] Annual operating expenditure figures includes unregulated services but excludes land tax and direct expenditures associated with Melbourne Water's waterways services. The result for 2002/03 includes a write-back of a $20 million provision for remediation of the Dandenong Treatment Plant that resulted in a one off reduction in operating expenditure.

11.2 Operating expenditure forecasts

11.2.1 Overview

Forecast operating expenditure over the 2009 regulatory period totals around $1.4 billion. A significant increase in the last two years of the 2009 regulatory period will mean average annual expenditure is approximately $362.5 million compared to $168.0 million over the 2005 regulatory period. Figure 11.2 illustrates this for each product on an annual basis since 2005/06.

Figure 11.2: Actual and Forecast Operating Expenditure – 2005/06 to 2012/13



	2005/06 Actual	2006/07 Actual	2007/08 Actual	2008/09	2009/10	2010/11	2011/12	2012/13
Water	53.8	62.8	78.1	76.9	81.3	91.3	301.4	510.4
Sewerage	59.5	65.1	66.2	73.0	77.9	80.9	82.5	85.9
Recycled Water	5.8	4.8	6.1	8.1	8.0	7.6	7.3	7.3
Corporate	29.1	27.3	45.4	32.2	30.3	29.4	24.4	24.2
Total	148.2	160.1	195.8	190.2	197.6	209.2	415.6	627.7

Total operating expenditure is expected to increase over the 2009 regulatory period, on average, by approximately 34% per year relative to 2007/08.[90] A key driver of the increase in operating expenditure is meeting new obligations (see Section 11.2.2).

In terms of industry-wide unit costs/prices, market determined price increases will impact on Melbourne Water's operating expenditure estimates for both its new obligations and business as usual activities over the 2009 regulatory period. In particular:

- Contract rates for civil, mechanical and electrical maintenance are forecast to increase by more than the consumer price index (CPI), as reflected by anticipated movements in general construction escalation rates and labour rates included in Enterprise Bargaining Agreements for these industries
- Labour rates are forecast to increase broadly in line with Melbourne Water's current Enterprise Agreement
- Contract electricity prices are assumed to increase, relative to 2007/08, by more than 15% (over 2008/09 and the 2009 regulatory period), based on independent forecasts. This is consistent with recent upward market trends in contract electricity prices.

90 Based on the Commission's approach it has used previously for calculating growth.

In relation to electricity prices, Melbourne Water considers that the 15% forecast increase used by the Commission for the purposes of determining its *2008 Water Price Review* in June 2008, does not adequately reflect the potential change in future prices arising from the introduction of the Commonwealth's Carbon Pollution Reduction Scheme (CPRS).

Melbourne Water currently has an electricity contract in place for the 2008/09 to 2009/10 period which accounts for the majority of the proposed increase. In regards to estimating energy costs for the remaining years of the regulatory period (2010/11 to 2012/13), Melbourne Water has obtained independent electricity price forecasts from McLennan Magasanik Associates (MMA) which indicate a range between $88.38 per MWh (under a high carbon price scenario), $65.99 per MWh (under a medium carbon price scenario) and $51.36 per MWh (under a low carbon price scenario).[91]

For the purposes of forecasting energy costs for the regulatory period, Melbourne Water has used estimates that are consistent with the independent electricity price forecasts.

11.2.2 New obligations and business as usual expenditures

Operating expenditure associated with new regulatory obligations is forecast to significantly increase over the 2009 regulatory period, primarily driven by the commissioning of the water supply augmentation projects. Operating expenditure associated with business as usual activities is forecast to increase, on average, by about 1% per year relative to 2007/08. When adjusted for growth, it more than meets the Commission's expectation of at least a 1% productivity saving per annum, based on the methodology and cost drivers described in Chapter 6.

New obligations

As discussed in Chapter 6, the Commission has defined new obligations as those that come into effect from 1 July 2009. Melbourne Water considers that a supplementary approach is to identify new obligations which came into effect within the 2005 regulatory period and which were not included in the 2005 Water Plan.

New obligations coming into effect from 1 July 2005, and which were not included in the 2005 Water Plan, are outlined in Chapter 5. Operating expenditure planned to meet these new obligations over the 2009 regulatory period is significant and includes that for:

- Payment obligations in relation to the Victorian Desalination Project
- Operating the Sugarloaf Pipeline linking the Melbourne supply system to the Goulburn River, which includes purchasing renewable energy certificates to power the Sugarloaf Pipeline by renewable energy
- Reconnecting Tarago Reservoir
- Applying sustainable management principles to programs and activities to ensure the ongoing sustainability of resources
- Ensuring dam safety for non-operational assets, including the Devilbend reservoir
- Managing environmental flows in line with newly established Bulk Entitlements.

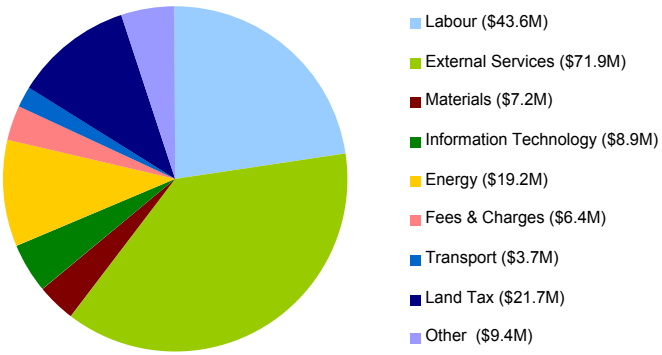
[91] MMA's forecasts are for energy prices only and not the delivered prices, which include NEMMCO charges, NUoS charges, billing and Renewable Energy Certificate flow through costs from the electricity retailers.

Business as usual activities

Forecast operating expenditure on business as usual activities totals $766.7 million over the 2009 regulatory period.

Figure 11.3 shows the average annual composition of the proposed business as usual operating expenditure by resource input. Major resource inputs of operating expenditure will continue to be subject to contracting and competitive tendering over the 2009 regulatory period, including external services, materials, energy, information technology and transport.

Figure 11.3: Average annual total business as usual operating expenditure by resource input – 2009/10 to 20012/13



Operating expenditure on business as usual activities over the 2009 regulatory period is forecast to increase, on average, by about 1% per year relative to 2007/08.[92]

The 1% increase is a net result of a number of increases in major cost inputs that have been offset by cost savings.

Major drivers over the 2009 regulatory period for the increase in business as usual operating expenditure, relative to 2007/08, include:

- Higher land tax due to projected increases in the unimproved value of land and forecast sales and acquisitions over the 2009 regulatory period. This increase takes into account the reduced land tax rate announced in the 2007 State Budget ($23.4 million)
- Higher maintenance costs ($17.9 million) arising from:
  - The increasing size of Melbourne Water's civil and mechanical and electrical asset base (see Figure 11.4)
  - The changing mix of these assets, with mechanical and electrical assets now making up an increasing proportion of the total asset base
  - Increase in contract rates for civil and mechanical and electrical maintenance due to market conditions.
- Increased energy costs due to higher electricity prices and usage ($13.6 million)

[92] Based on the formula provided by the Commission in its guidance paper for preparing the 2009 Water Plan.

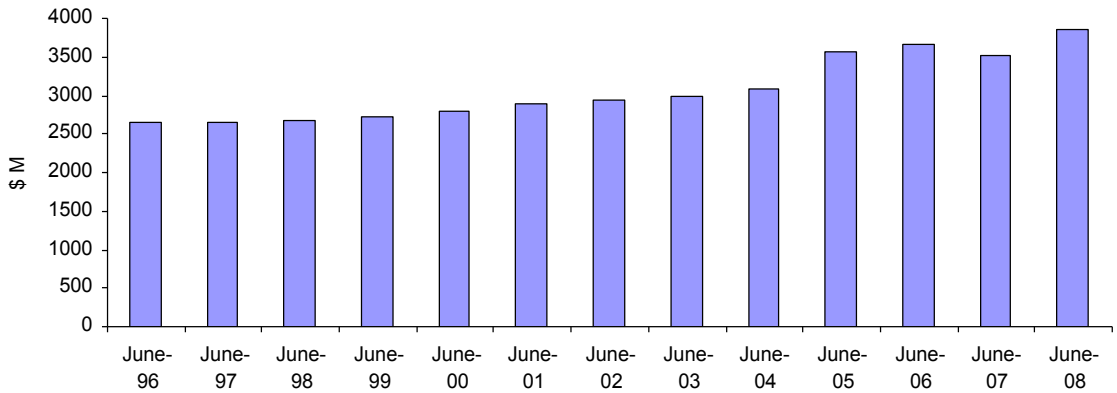
- Increased sludge harvesting and under cover desludging activities required at the Western Treatment Plant ($11.3 million)
- Achieving improved compliance against existing obligations with respect to the reuse of biosolids ($7.2 million)
- Purchasing carbon permits to meet Melbourne Water's expected obligation under the Commonwealth Government's proposed Carbon Pollution Reduction Scheme (CPRS) ($6.8 million)
- Higher labour costs due to labour rate increases that are broadly in line with Melbourne Water's Enterprise Agreement ($6.2 million).

The above increases in business as usual activities have been partially offset by expected decreases in expenditures associated with:

- The proposed treatment of mini-hydros as 'regulated' business and the use of renewable energy generated by the mini-hydro plants to replace higher cost retail electricity supplies from the grid ($7.2 million)
- Estimated cost savings from shared service and coordinated procurement arrangements with the retail water businesses. These estimates are preliminary and will be refined as the Melbourne water industry works together to determine the optimal way in which to meet the State Government's requirement of pursuing savings ($5.5 million)

As noted in Chapter 5, a driver of increased operating expenditure over the 2005 regulatory period is the one-off cost in 2007/08 associated with a reduction in the value of Melbourne Water's defined benefit superannuation fund, due to declines in share-market returns ($18.8 million). Therefore, operating expenditure would have been lower in 2007/08 without this one-off cost. Given the current volatility in international share-markets, it is possible that the proposed operating expenditures included in the 2009 Water Plan could be subject to variances as a result of changes to the value of Melbourne Water's defined benefit superannuation fund.

Figure 11.4: Written down historical costs of assets[93]

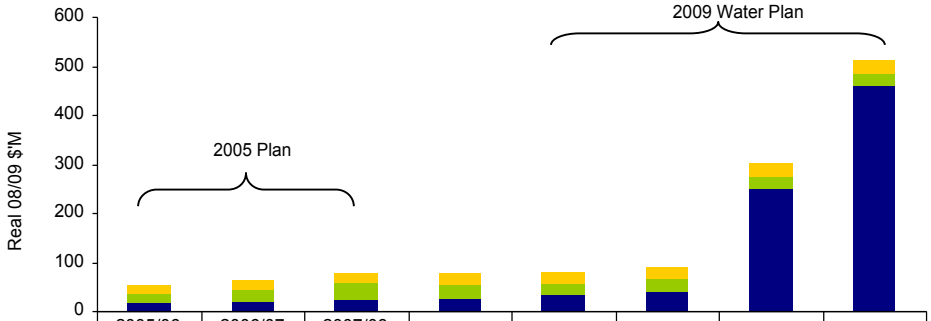


[93] The large increase between June 2004 and June 2005 reflects changed International Financial Reporting Standards.

11.2.3 Water

Forecast operating expenditure on water services is $984.4 million[94] over the 2009 regulatory period, accounting for 68% of forecast expenditure for the business.
A significant increase in the last two years of the 2009 regulatory period will mean average annual expenditure is $246.1 million compared to $64.9 million over the 2005 regulatory period. Figure 11.5 illustrates this for each program on an annual basis since 2005/06.

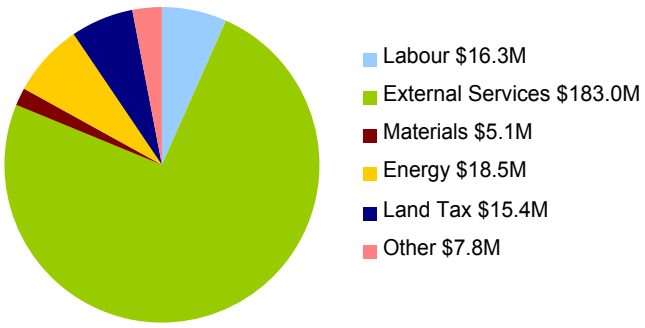
Figure 11.5: Water operating expenditure – 2005/06 to 2012/13



	2005/06 Actual	2006/07 Actual	2007/08 Actual	2008/09	2009/10	2010/11	2011/12	2012/13
Water Transfer	15.8	18.5	21.2	23.7	23.9	24.5	25.4	26.0
Water Quality	21.0	22.3	31.7	26.8	24.6	24.6	24.7	24.9
Production & Storage	16.9	22.0	25.2	26.4	32.9	42.3	251.3	459.6
Total	53.8	62.8	78.1	76.9	81.3	91.3	301.4	510.4

Figure 11.6 shows the average annual composition of the forecast operating expenditure on water services by resource input.

Figure 11.6: Average annual water operating expenditure by resource input – 2009/10 to 2012/13



Operating expenditure is expected to increase over the 2009 regulatory period, on average, by approximately 60% per year, relative to 2007/08.

[94] Excludes corporate expenditure.

A key driver of the increase in operating expenditure is meeting new obligations, primarily due to commissioning of the water supply augmentation projects, as outlined in section 11.2.2.

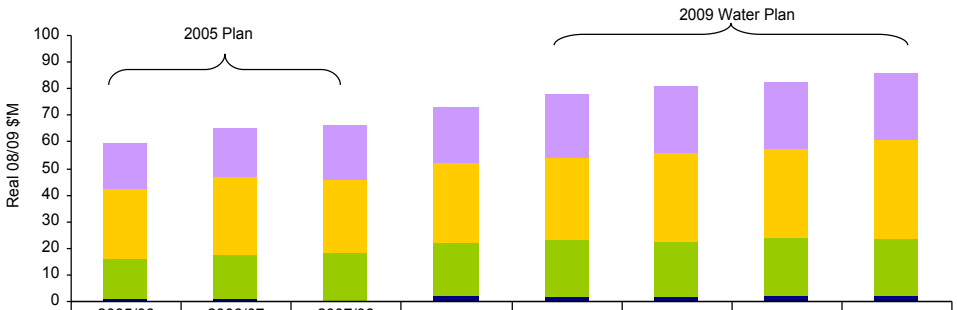
Major drivers for the increase in business as usual activities, relative to 2007/08, include:

- Higher land tax due to projected increases in the unimproved value of land ($16.5 million)
- A combination of higher contract rates for electricity and maintenance and increases in operating costs due to higher volumes of water passing through the Winneke Treatment Plant from commissioning of the Sugarloaf Pipeline:
  - Increase in energy ($8.4 million)
  - Increase in mechanical and electrical maintenance ($4.5 million)
  - Increase in chemicals ($1.6 million)
- Higher labour costs due to labour rate increases that are broadly in line with Melbourne Water's Enterprise Agreement ($1.7 million).

11.2.4 Sewerage

Forecast operating expenditure on sewerage services is $327.3 million[95] over the 2009 regulatory period which accounts for 23% of forecast expenditure for the business. Average annual expenditure is $81.8 million compared to $63.6 million over the 2005 regulatory period. Figure 11.7 illustrates this for each program on an annual basis since 2005/06.

Figure 11.7: Sewerage operating expenditure - 2005/06 to 2012/13

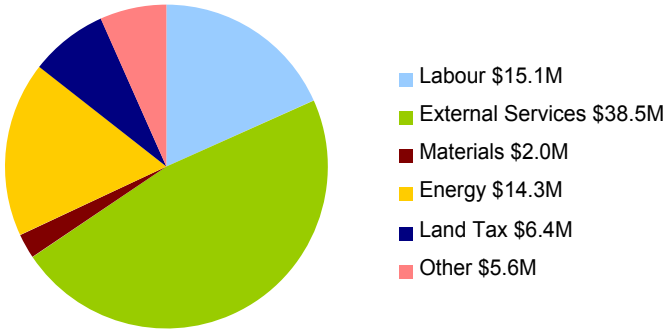


	2005/06 Actual	2006/07 Actual	2007/08 Actual	2008/09	2009/10	2010/11	2011/12	2012/13
Sew Treatment - WTP	16.9	18.3	20.3	21.2	23.8	25.1	25.0	25.3
Sew Treatment - ETP	26.7	28.9	27.8	29.9	31.0	33.0	34.0	36.8
Sewerage Transfer	15.0	17.0	17.9	19.8	21.4	21.4	21.4	21.7
Sew - Biosolids	0.9	0.9	0.3	2.2	1.6	1.5	2.2	2.1
Total	59.5	65.1	66.2	73.0	77.9	80.9	82.5	85.9

Figure 11.8 shows the average annual composition of the forecast operating expenditure on sewerage services by resource input.

[95] Excludes corporate expenditure.

Figure 11.8: Average annual sewerage operating expenditure by resource input – 2009/10 to 2012/13



Operating expenditure is expected to increase over the 2009 regulatory period, on average, by approximately 7% per year relative to 2007/08.

The increase is primarily due to business as usual activities driven by compliance activities associated with meeting existing environmental obligations and discharge licence requirements.

Major drivers for the increase in business as usual activities, relative to 2007/08, include:

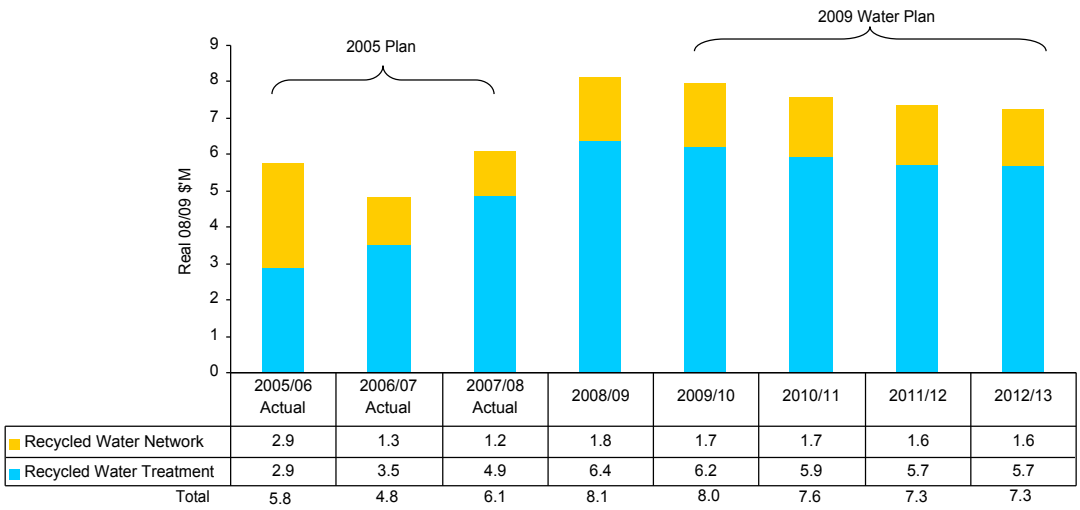
- Increased mechanical and electrical maintenance costs of $11.5 million reflecting higher market contract rates and additional maintenance costs, associated with the construction of new assets such as:
  - The Eastern Green Energy Project
  - The new odour control plant at the Western Treatment Plant and those plants associated with the Northern Sewerage Project
  - The sludge digestion augmentation works and aeration tanks at the Eastern Treatment Plant.
- Increased sludge harvesting and under cover desludging activities required at the Western Treatment Plant ($11.3 million)
- Costs associated with pursuing options for the reuse of biosolids and support for the development of emerging decontamination and reuse technologies ($7.2 million)
- Higher land tax due to projected increases in the unimproved value of land ($6.9 million)
- Purchasing carbon permits to meet Melbourne Water's expected obligation under the Commonwealth Government's proposed Carbon Pollution Reduction Scheme (CPRS) ($6.8 million)
- Increased energy costs due to higher electricity prices and additional energy requirements resulting from the Eastern Treatment Plant tertiary treatment upgrade ($5.4 million)
- Higher labour costs due to labour rate increases that are broadly in line with Melbourne Water's Enterprise Agreement ($4.9 million)
- Higher chemical costs due to increased use of polyelectrolyte required for sludge augmentation works at the Eastern Treatment Plant ($3.6 million)
- Increase in structural investigations due to the age and risk profile of sewers together with improved CCTV techniques, which generate both the need and opportunity for increased monitoring, and provides the ability to optimise future maintenance and capital costs through CCTV inspections and walk throughs ($2.7 million).

In terms of new obligations over the 2009 regulatory period, additional operating expenditure is required to implement the Sustainable Management Principles, required under the Statement of Obligations. This involves undertaking renewable energy studies and energy efficiency programs along with implementing strategies in relation to improving waste minimisation and biodiversity values ($3.7 million).[96]

11.2.5 Recycled Water

Forecast operating expenditure on recycled water services is $30.2 million[97] over the 2009 regulatory period which accounts for 2% of forecast expenditure for the business. Average annual expenditure is $7.5 million compared to $5.6 million over the 2005 regulatory period. Figure 11.9 illustrates this for each program on an annual basis since 2005/06.

Figure 11.9: Recycled water operating expenditure - 2005/06 to 2012/13



	2005/06 Actual	2006/07 Actual	2007/08 Actual	2008/09	2009/10	2010/11	2011/12	2012/13
Recycled Water Network	2.9	1.3	1.2	1.8	1.7	1.7	1.6	1.6
Recycled Water Treatment	2.9	3.5	4.9	6.4	6.2	5.9	5.7	5.7
Total	5.8	4.8	6.1	8.1	8.0	7.6	7.3	7.3

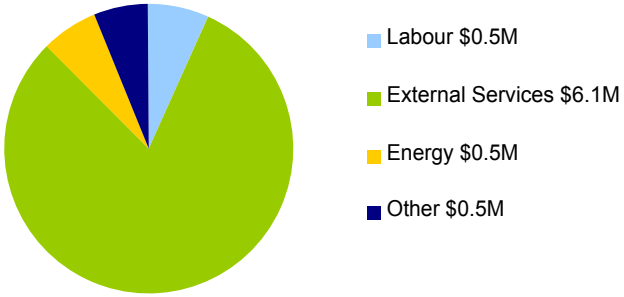
While operating expenditure is forecast to decrease from 2009/10, it is noted that upgrading the Eastern Treatment Plant to tertiary standard by 2012 will facilitate future water recycling opportunities.

Figure 11.10 shows the average annual composition of the forecast operating expenditure on recycled water services by resource input.

[96] Expenditure on these items will also occur for water, however, the majority of the costs (and benefits) are in relation to sewerage.

[97] Excludes corporate expenditure.

Figure 11.10: Average annual recycled water operating expenditure by resource input – 2009/10 to 2012/13



Operating expenditure is expected to increase over the 2009 regulatory period, on average, by approximately 5% per year relative to 2007/08. The increase is primarily due to business as usual activities.

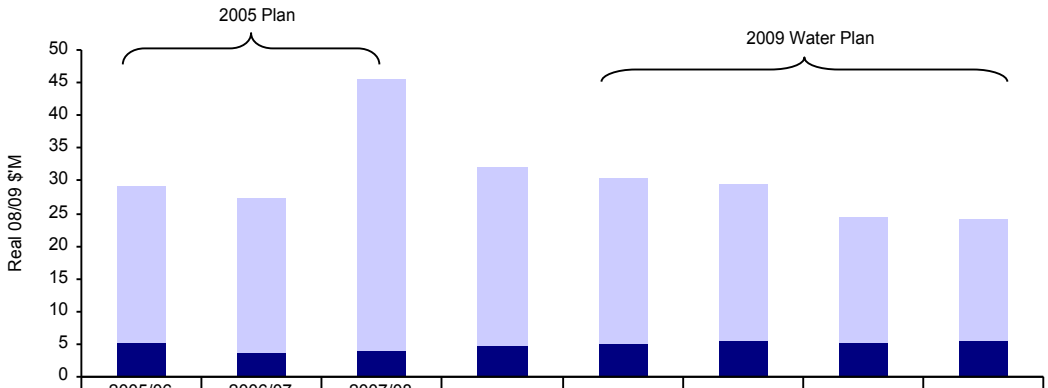
Major drivers for the increase in business as usual activities, relative to 2007/08, include:

- Higher mechanical and electrical maintenance costs due to the ageing and increased use of assets to meet higher demand for recycled water ($1.9 million)
- Recycled water research costs to further advance and refine recycled water management and supply approaches ($0.9 million).

11.2.6 Corporate

Forecast operating expenditure on corporate activities is $108.3 million over the 2009 regulatory period which accounts for 7% of forecast expenditure for the business. Average annual expenditure is $27.1 million compared to $34.0 million over the 2005 regulatory period. Figure 11.11 illustrates this for each program on an annual basis since 2005/06.

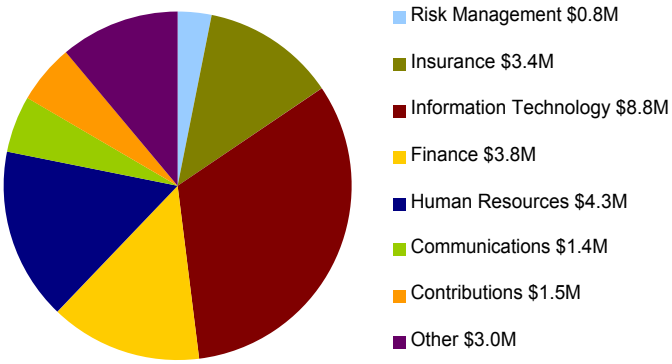
Figure 11.11: Corporate operating expenditure – 2005/06 to 2012/13



	2005/06 Actual	2006/07 Actual	2007/08 Actual	2008/09	2009/10	2010/11	2011/12	2012/13
Other	24.0	23.5	41.3	27.6	25.2	24.0	19.1	18.7
Insurance	5.1	3.8	4.1	4.6	5.1	5.4	5.3	5.4
Total	29.1	27.3	45.4	32.2	30.3	29.4	24.4	24.2

Figure 11.12 shows the average annual composition of the forecast operating expenditure on corporate services by resource input.

Figure 11.12: Average annual corporate costs by resource input – 2009/10 to 2012/13



Operating expenditure is expected to decrease over the 2009 regulatory period, on average, by approximately 15% per year relative to 2007/08.

The decreases in corporate operating expenditure are driven by savings in business as usual activities that include:

- The proposed treatment of mini-hydros as 'regulated' business and the use of renewable energy generated by the mini-hydro plants to replace higher cost retail electricity supplies from the grid ($7.2 million)
- Estimated cost savings from shared service and coordinated procurement arrangements with the retail water businesses. These estimates are preliminary and will be refined as the Melbourne water industry works together to determine the optimal way in which to meet the State Government's requirement of pursuing savings ($5.5 million)

As noted in Chapter 5, a driver of increased operating expenditure over the 2005 regulatory period is the one-off cost in 2007/08 associated with a reduction in the value of Melbourne Water's defined benefit superannuation fund due to declines in share-market returns ($18.8 million). Therefore, operating expenditure would have been lower in 2007/08 without this one-off cost.

11.3 Benchmarking Operating Efficiency

Melbourne Water participates in benchmarking to:

- Measure and assess its performance
- Improve its business performance.

In striving to continuously improve operating efficiency and customer service, Melbourne Water monitors best practice and innovation, both within and outside the water industry, and participates in national and international benchmarking studies including:

- Annual metric benchmarking, primarily conducted by the WSAA/National Water Commission
- A rolling program of process benchmarking of Australian and New Zealand businesses, also through WSAA
- International benchmarking
- Sustainability benchmarking.

Melbourne Water has generally performed well in benchmarking studies, reflecting its ongoing drive for continuous improvement and operating efficiency. Where areas for improvements have been identified through benchmarking studies, Melbourne Water has endeavoured to identify and implement best practice in a timely manner.

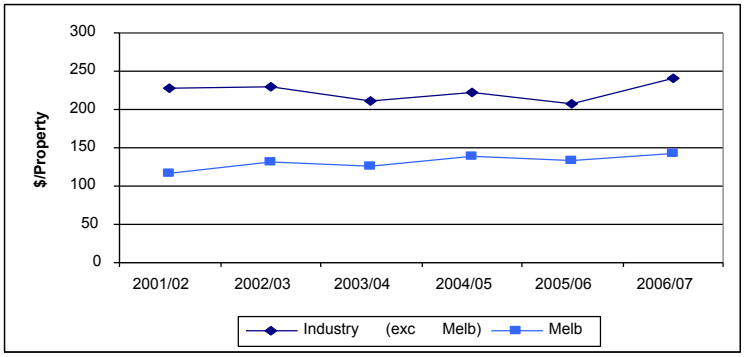
Metric Benchmarking

Melbourne Water has participated in Australian water industry metric benchmarking studies since 1986. Metric benchmarking enables various parameters relating to assets, service delivery and financial data to be compared across businesses.

Since 2005/06, the National Water Commission, a party to the National Water Initiative and WSAA, has been responsible for producing the *National Performance Report* which is designed to facilitate national benchmarking. WSAA produced an annual water industry report (WSAA*facts*) prior to the publication of the National Performance Report.

Figures 11.13 and 11.14 provide a comparison of water and sewerage operating costs per property for Melbourne against the Australian water industry average from 2001/02 to 2006/07.[98] The operating costs for Melbourne Water and the Melbourne retail water businesses have been consolidated to provide a meaningful comparison with vertically integrated businesses in other States.

Figure 11.13: Water operating costs per property – 2001/02 to 2006/07 (real 2006/07 dollars)



Sourced or estimated from WSAAfacts 2005 (1999/00 – 2004/05), National Performance Report 2005-06, National Performance Report 2006-07 and Melbourne Water

[98] Australian water industry comprises the average for Brisbane Water, Hunter Water Corporation, South Australian Water Corporation, Sydney Water Corporation and Water Corporation of Western Australia.

Figure 11.14: Sewerage operating costs per property – 2001/02 to 2006/07 (real 2006/07 dollars)

Sourced or estimated from WSAAfacts 2005 (1999/00 – 2004/05), National Performance Report 2005-06, National Performance Report 2006-07 and Melbourne Water

As illustrated in the figures above, the operating costs for water and sewerage in Melbourne has remained below the Australian water industry average since 2001/02.

Caution should be exercised in comparing performance across water businesses of different sizes, service requirements and operating environments. However, it is noted that Melbourne Water's and the retail water businesses' operating costs per property are low by national standards.

This has been achieved within an increasingly difficult operating environment of continued drought conditions and additional State Government and regulatory obligations and requirements.

Lower operating cost per property have resulted in Melbourne having the lowest combined water and sewerage bill in comparison to other major water businesses in Australia for 2006/07.[99]

In addition, Melbourne Water and the retail water businesses perform well when benchmarked against international water businesses:

- Household bills in Melbourne are approximately 20% less than the average of England and Wales
- Domestic water and sewerage prices in Melbourne are approximately half that of Copenhagen and Berlin which were identified as the most expensive cities in the survey.[100]

Process Benchmarking

Melbourne Water has focused on those areas of process benchmarking that are relevant to a wholesale water business and have the greatest impact on current and expected future costs. Given the size of Melbourne Water's mechanical and electrical asset base and level of operating expenditure spent on maintenance activities (see section 11.2.2), it has been involved in benchmarking studies examining the processes associated with mechanical and electrical maintenance and asset management. Previously, Melbourne Water has also participated in a benchmarking study on shared / corporate services.[101]

[99] Based on the National Performance Report 2006-07, Figure 7-1-1. City West Water, South East Water and Yarra Valley Water had the lowest typical residential bill for water and sewerage for major utilities with 100,000+ customers.

[100] Based on the International comparison of water and sewerage service 2007 report compiled by Ofwat.

[101] This study was undertaken by WSAA in 2003/04. At this stage, WSAA does not plan to repeat or update this study.

The results of these benchmarking studies are outlined below and demonstrate Melbourne Water's operating efficiencies in these areas.

Mechanical and Electrical Maintenance

In 2006, on behalf of WSAA, UMS-GHD completed a study of mechanical and electrical maintenance activities. This study involved 18 major Australian urban water businesses and overseas water utilities (from New Zealand and the United States). The areas covered in the benchmarking study included breakdown maintenance, scheduled maintenance and renewal maintenance for:

- Water and sewerage pumping stations
- Water and sewerage treatment plants
- Water disinfection plants.

The key outcomes from this study included:

- Melbourne Water was in the overall leading practice group
- Only 1% of prospective savings were identified for Melbourne Water, only one other participating water business was lower than this
- Comparison of results with the 2001 Mechanical and Electrical Maintenance Performance Benchmarking study highlighted that Melbourne Water has achieved a 16% increase in efficiency on a composite cost performance
- Consistent alignment of results across all benchmarked categories and activities that indicates the overall strength of Melbourne Water's approach to mechanical and electrical maintenance practices.

The strong result of a 16% efficiency gain from the 2001 to 2006 period can be attributed to:

- The implementation of Melbourne Water's contract strategy
- An increased focus on asset management, specifically in relation to a greater understanding of the service level requirements for assets.

Although these results are confined to mechanical and electrical assets, the strategies and improvements applied to the mechanical and electrical asset base are also applied to the remaining Melbourne Water asset base as part of its integrated Asset Management System. Therefore, it is expected that similar efficiency gains have been realised for other assets which have been reflected in the proposed expenditures for the 2009 regulatory period.

Asset Benchmarking

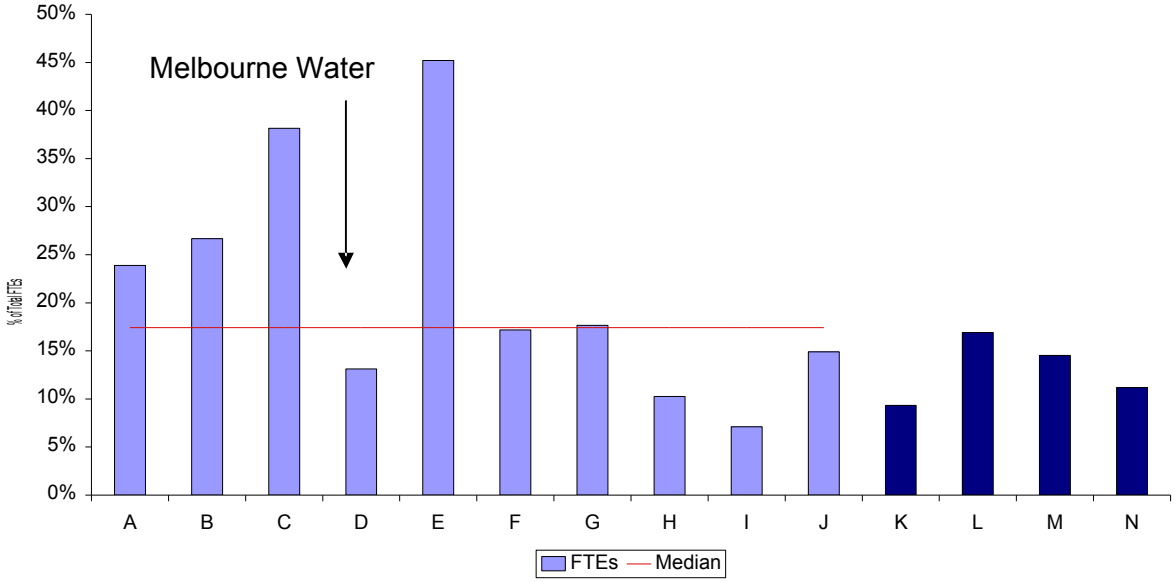
In 2004 and 2008, Melbourne Water participated in benchmarking reviews of asset management practices conducted by WSAA. The results of the 2008 study are discussed in Chapter 9 (see section 9.3) and show that Melbourne Water operates its asset management process at, or close to, best practice within the water industry. This result follows on from Melbourne Water's solid performance in the 2004 benchmarking review.

Corporate Services

In 2003, Melbourne Water participated in a WSAA benchmarking study around corporate services. In this study, WS Atkins Planning and Management Consultants benchmarked corporate services provided by ten Australian water businesses including finance, human resources, information technology and communications.

As illustrated in Figure 11.15, Melbourne Water has a relatively small number of corporate staff compared to other Australian and overseas water businesses. The study also suggests that Melbourne Water's corporate service areas provide high levels of service at low cost with each service area ranked within the top quartile of participating businesses.

Figure 11.15: Corporate employees as a proportion of total business



Note: Businesses A to J are Australian water businesses; K to N are comparable overseas water businesses.
Source: Water Services Association of Australia 2004

Melbourne Water demonstrated best practice in human resources, including implementing performance cultures along with management development programs, financial management reporting and procurement practices. Melbourne Water focus on continuous improvement includes:

- A long-term program (Preferred Culture Program) to build a more constructive and progressive culture within Melbourne Water
- Improvements in recruitment and staff development programs
- Improved human resources related processes and workflow
- Increased technical and personal training to progress the individual development of employees
- Deployment of a new Safety Management System.

Since this study, Melbourne Water has maintained its relatively small number of corporate staff. In 2007/08, business service staff represented approximately 14% of total staff.[102] This includes an increase in business service staff to perform human resource functions that were previously not done in-house and which will generate efficiencies (see section 11.4). Over the 2009 regulatory period, the ratio of business service staff to total staff will remain relatively stable.

[102] This includes Finance, Information Technology, Human Resources, and Risk Management staff.

International Benchmarking

The United Kingdom Water Services Regulation Authority (Ofwat) regularly benchmarks performance of the English and Welsh water industry to European and other international water businesses. Results of the benchmarking study are outlined in the *International Comparison of Water and Sewerage Service* report which, amongst other things, compares the unit costs of water delivered and sewage collected.

While Melbourne Water is not included as a separate entity in the report, its cost performance contributes to the outcomes achieved by the retail water businesses as the wholesale supplier.[103] As illustrated in Table 11.1, results of the 2007 study indicate that the water and sewerage unit costs for Melbourne's water businesses are well below the average for England and Wales.

Table 11.1: Comparison of water and sewerage unit costs

	Water delivered, unit costs (per cubic metre) – total cost	Sewage collected, unit costs (per cubic metre) – total cost
England and Wales average	77	98
City West Water	47	40
South East Water	44	61
Yarra Valley Water	47	53

Source: *International Comparison of Water and Sewerage Service*, 2007 report compiled by Ofwat, for the year 2004/05

In addition to formal benchmarking studies, Melbourne Water has also pursued informal opportunities for information sharing to facilitate continuous improvement. This has included a benchmarking exercise with a leading United Kingdom water business in 2005/06 which resulted in the identification of further efficiency improvement initiatives. The results of this benchmarking exercise are discussed in Chapter 9 (see section 9.2). It also has close ties with water businesses in the United States of America, South East Asia and the Middle East.

Sustainability Benchmarking

In 2007, Melbourne Water participated in a process to assess its sustainability performance against publicly listed companies considered to be world leaders in sustainability. The Sustainable Asset Management Group (SAM), which publishes and licenses the Dow Jones Sustainability World Indexes (DJSI), carried out the benchmarking survey. The SAM benchmarking compared Melbourne Water to global sustainability leaders on the basis of economic, environmental and social criteria.

The results from this survey indicate that Melbourne Water is performing well against global water utilities that are DJSI listed companies worldwide and Australian SAM Sustainability Index (AuSSI) listed Australia-wide companies. The total Melbourne Water DJSI World score rose from 69% in 2005/06 to 71% in 2006/07, while the best scoring company increased from 70% in 2005/06 to 74%. This places Melbourne Water 3% behind the best global company in the water sector (the average score globally was 61%). Melbourne Water is also implementing a number of improvement measures in response to the benchmarking results.

The results of this benchmarking exercise are further discussed in Chapter 9 (see section 9.1).

[103] The National Performance Report 2005-06 for major urban water utilities shows that Melbourne Water's operating cost per property represented less than 25% of each of the metropolitan retail water businesses' cost for water and sewerage respectively.

11.4 Efficiency gains and initiatives

In its September 2008 *Supplementary Guidance on Water Plans*, the Commission noted that it expects water businesses to demonstrate that:

- Proposed operating expenditure is efficient
- Targeted annual savings from the implementation of shared services and bulk procurement of materials as a result of recommendations from the Victorian Competition and Efficiency Commission are included in proposed operating expenditures
- Proposed business as usual operating expenditure includes an average annual productivity improvement of 1% per annum.

Melbourne Water pursues operating efficiencies in the context of maximising value and managing risks. This requires a balance to be struck between seeking immediate cost savings and the need to:

- Minimise costs over the asset life cycle by identifying the most efficient mix of capital and operating expenditure. In some cases, achieving efficiencies in capital expenditure may require upfront operating expenditure. For example, operating expenditure to undertake scanning of water balancing tank floors will provide a more accurate assessment of the condition of floor plates. The results of the assessment will enable the timing of renewal capital expenditure to be more accurately forecasted
- Generate savings over a longer timeframe
- Maintain customer service levels
- Meet environmental or community requirements and minimise the risk of injury to Melbourne Water employees or contractors
- Ensure that all significant risks are identified, understood, allocated to the party best placed to manage them and, to the extent possible, are mitigated.

As noted in section 11.3, while Melbourne Water as a business has achieved significant efficiency improvements in the past, it strives for continuous improvement and innovation. Melbourne Water has implemented a number of efficiency initiatives since the Commission's 2005 Price Determination, including those identified in its 2005 Water Plan. In particular, it has installed a trickling filter at the Spotswood Odour Control Plant to reduce odorous gases in sewage prior to it proceeding through the final filter. It also constructed a static screens gantry system at Eastern Treatment Plant to eliminate the need for crane hire when cleaning screens at the inlet of the outfall pumping station. These actions have led to savings of approximately $0.5 million.

Over the 2005 regulatory period, additional efficiency initiatives have also been generated that include:

- New contractual arrangements to outsource out-of-hours alarm monitoring ($0.9 million)
- Bringing staff recruitment activities in house and only using external recruitment agencies for specialist roles and hard to fill positions ($0.5 million per year).

Melbourne Water also recently completed the Eastern Green Energy Project, in September 2008, which will lead to cost saving being achieved through lower energy usage over the 2009 regulatory period. It will also continue to progress the replacement of motor thyristor drives, used to control the speed of pumps at Yering Gorge Pump Station and lower energy usage, over the 2009 regulatory period.

The cornerstone of efficiency initiatives implemented by Melbourne Water includes the development of a Contract Strategy which aims to increase the value provided by its contract maintenance and goods/capital acquisition. Consistent with this Strategy, Melbourne Water's maintenance contracts are developed based on:

- Building relationships with contract service providers and developing contracts that align commercial objectives by including performance based financial and, where appropriate, non-financial incentives (e.g. increasing the scope or duration of the contract)
- Consolidating maintenance contracts for generic services where appropriate
- Maintaining separate contracts for highly specialised services such as corrosion and hydrographics services
- Exercising caution in contracting out core functions or where outcomes and performance are difficult to define.

An example of savings achieved through improved contract processes is renegotiating energy supply contracts to enable the power generated by mini-hydros to be transferred for use at other Melbourne Water sites, therefore, reducing its energy operating expenditures. This is discussed further in the case study below.

Efficiency initiatives planned for the 2009 regulatory period are outlined in Table 11.2. Efficiency gains from initiatives implemented to date and planned initiatives have been incorporated into Melbourne Water's operating expenditure forecasts for the 2009 regulatory period. These efficiency gains contribute towards Melbourne Water more than meeting the Commission's growth adjusted productivity improvement of 1% per annum in business as usual expenditure, based on the resource inputs and growth drivers outlined in Chapter 6.

Table 11.2: Operating efficiency initiatives and estimated cost savings for the 2009 regulatory period

Initiative	Benefits
Projects to generate power by mini hydros for use at other Melbourne Water sites (refer case study below)	Reduction in energy costs of $7.2 million over the 2009 regulatory period
Targeted savings from shared service and coordinated procurement arrangements with the retail water businesses	Estimated cost savings of $5.5 million over the 2009 regulatory period [104]
Reduction in telecommunications cost through implementation of Telemetry Internet Protocol, renegotiation of supply contracts and other innovations	$0.3 million per year.
Improved oxygen transfer in the ammonia reduction process at Eastern Treatment Plant with the use of more efficient diffusers	Reduced energy costs excluding load growth ($0.2 million per year from 2010/11)
Replacement of fluoride slurry with fluoride acid to lower water treatment costs at Silvan reservoir	Reduced materials and energy costs ($0.2 million for 2009/10)
Review of the contract for Health and Safety Services to improve delivery and to promote increased use of in-house services	Reduced corporate costs ($0.1 million per year)
Implement an electronic system to facilitate improvements in staff recruitment processes	Reduced labour costs ($0.1 million per year)

[104] These estimates are preliminary and will be refined as the Melbourne water industry works together to determine the optimal way in which to meet the State Government's requirement of pursuing savings following the inquiry into reform of the metropolitan retail water sector by the Victorian Competition and Efficiency Commission.

Case study – Energy

Melbourne Water is among the top 15 electricity users in Victoria and is included in the 250+ corporations whose energy consumption is causing its inclusion in the Federal Government's Energy Efficiency Opportunities program. Melbourne Water aims to achieve operating expenditure savings over the 2009 regulatory period by:

Maximising its capacity to generate renewable energy

In 2008, Melbourne Water negotiated a new electricity agreement with AGL that enables the power generated by its mini-hydros to be notionally used at other Melbourne Water sites for a small fee. This initiative also has additional benefits in reducing purchases of renewable energy and/or greenhouse gas emission offsets to reduce CO_2 equivalent emissions. Melbourne Water has the following projects to generate electricity at Melbourne Water sites:

- Preston, Notting Hill and Mountain View mini-hydros, which have been commissioned
- Three other mini-hydros along with the Sugarloaf mini-hydro proposed over the 2009 regulatory period

These projects are expected to generate cost savings of approximately $7.2 million over the 2009 regulatory period.

Developing an Energy Efficiency Management Strategy

Melbourne Water will maintain a focus on energy efficiency and plans to continue to conduct energy efficiency studies at key sites. It is expected that at the end of the 2009 regulatory period, Melbourne Water will generate just over 40% of its energy requirements. Melbourne Water will develop an Energy Efficiency Management Strategy covering all Melbourne Water sites. Outcomes from the strategy and studies will be incorporated into Melbourne Water's response to EPA Victoria's Environment and Resource Efficiency Plans program which targets energy efficiency, water usage and waste production.

Chapter 12

Financing capital investments and taxation

In determining the 2009 Water Plan revenue requirement, Melbourne Water has adopted a real, post-tax Weighted Average Cost of Capital of 5.8% and has applied a straight line depreciation profile for existing assets, while deferring most of the depreciation for new assets. This is consistent with the working assumptions provided by the Minister for Water for preparing the 2009 Water Plan.

This chapter details the Weighted Average Cost of Capital that Melbourne Water intends to use in establishing the appropriate rate of return on the Regulatory Asset Value for the 2009 regulatory period. It also details Melbourne Water's views around the appropriate depreciation methodology.

12.1 Opening Regulatory Asset Value for the 2009 regulatory period

Melbourne Water has used the Commission's 'building block' method for calculating prices. This includes actual capital investment, contributions and disposals over the 2005 regulatory period and forecasts for the 2009 regulatory period to determine Melbourne Water's Regulatory Asset Value, forming the basis for the return on assets and depreciation included in prices.

Reflecting the working assumptions provided by the Minister for Water to ensure that water consumers' average bills will approximately double (in real terms) by 2012, Melbourne Water has:

- Reduced its Regulatory Asset Value by $300 million to reflect the transfer to South East Water and City West Water
- Deferred $135 million of regulatory depreciation to the next regulatory period. This reflects the depreciation on 95% of the forecast capital expenditure over the 2009 regulatory period.

As a result, Melbourne Water's rolled forward Regulatory Asset Value as at 1 July 2009 is approximately $4.1 billion. This figure reflects Melbourne Water's actual capital expenditure in 2007/08 of $368 million and forecast capital expenditure of $1,016 million in 2008/09.

Return on assets and depreciation are both major inputs to Melbourne Water's revenue requirement for the 2009 regulatory period and are discussed below.

12.2 Weighted Average Cost of Capital

The Commission includes a fair commercial return in the prices as measured by its assessment of the Weighted Average Cost of Capital. Melbourne Water has used a real post-tax Weighted Average Cost of Capital of 5.8%, which reflects the working assumptions provided for the preparation of this 2009 Water Plan.

As noted in Chapter 6, Melbourne Water understands that following the Commission's review of the 2009 Water Plan, as well as those of the retail water businesses and any further information available to the Commission, the working assumption around the Weighted Average Cost of Capital may be revised.

In 2007, Melbourne Water and the retail water businesses commissioned consultants, the Strategic Finance Group (SFG), to provide an empirical estimate of the Weighted Average Cost of Capital for their businesses. SFG developed a real, post-tax Weighted Average Cost of Capital mid-point estimate but recommended a 75th percentile figure, based on empirical analysis of the underlying data, financial theory and the requirement for all Weighted Average Cost of Capital parameters to be estimated in an internally consistent manner.

The report detailing SFG's estimate (see Appendix 4) notes that a number of Weighted Average Cost of Capital parameters cannot be estimated with great precision, but can be narrowed down to an economically reasonable range. Further, SFG believes that a regulator should set the return from this range by taking account of estimation uncertainty and consider the consequences of under investment. The consequences of under investment include adverse impacts on the financial viability of the regulated water business and on future investment (see Appendix 4). An economically reasonable range can be established using Monte Carlo simulation. Importantly, SFG also notes that there is limited empirical evidence to support water businesses having a lower equity beta, or systematic risk, than other utilities, such as gas and electricity. In particular, data over the last 30 years indicates that the estimated betas of water businesses are not statistically significantly different from those of other utilities.

In addition, SFG notes that any estimate of gamma other than zero is inconsistent with the Officer Capital Asset Pricing Model Weighted Average Cost of Capital that is used by Australian regulators.

The report also draws on regulatory precedent to recommend that the 75th percentile estimate is a way of balancing the asymmetric consequences of over and under investment in key infrastructure (i.e. the costs of setting the Weighted Average Cost of Capital too low), are much more severe than the costs of setting it too high.

While supporting the conclusions of the SFG consultancy, in light of the advice from the Minister for Water, Melbourne Water has not used SFG's recommended approach. Melbourne Water does, however, believe that the issue of setting an appropriate Weighted Average Cost of Capital for water businesses should be further debated. Importantly, this includes the issues around the empirical estimates for equity beta and gamma.

The return on assets has been determined by applying a Weighted Average Cost of Capital of 5.8%, as per the working assumptions provided to Melbourne Water, to the average regulatory asset value for each year of the 2009 regulatory period. This represents around 44% of Melbourne Water's total revenue requirement. The return on assets for the 2009 regulatory period is shown in Table 12.2.

Table 12.2: Return on assets

	Forecast Year Ending					
	09/10 $M	10/11 $M	11/12 $M	12/13 $M	Total $M	NPV $M
Return on opening RAV 2009 regulatory period	233.1	228.8	224.6	220.3	906.8	812.8
Return on new assets[105]	81.6	121.1	145.2	156.7	504.6	445.4
Total	314.7	349.9	369.8	377.0	1,411.4	1,258.2

12.3 Depreciation

Melbourne Water proposes to adopt the straight line depreciation method to calculate the return of capital (depreciation) allowance for existing Regulatory Asset Values.

The depreciation allowance for existing assets incorporates the transfer of $300 million of existing Regulatory Asset Values to South East Water and City West Water.

Depreciation on new assets has also been calculated using the straight line depreciation method incorporating a deferral of $135 million (95% of new assets) of depreciation to the 2013 regulatory period. This is consistent with the working assumptions provided for preparing the 2009 Water Plan.

The allowance for a return of capital, or depreciation, represents the revenue Melbourne Water requires to efficiently maintain its capital asset base. Depreciation represents around 9% of Melbourne Water's total revenue requirement.

The following sections discuss Melbourne Water's proposed depreciation method and the asset lives to be applied.

12.3.1 Depreciation method

In its September 2008 *Supplementary Guidance Paper*, the Commission proposed that businesses should not claim depreciation on major assets until the asset enters service. The Commission also recognised that alternative depreciation methods may be used by the business. Further, it noted that businesses should consider how appropriate it may be to adopt a depreciation profile that better matches asset utilisation and/or to smooth price paths across regulatory periods, either by shifting some regulatory depreciation to a future period or by adopting a depreciation profile other than straight line.

The Commission also noted that other depreciation profiles, such as the annuities approach, may be used. This method attempts to align the depreciation profile with the use of the asset and is more applicable to renewals expenditure. This method is commonly used in the irrigation sector and is designed to smooth the depreciation profile over a period of time to align it to the average annual capital expenditure.

[105] New assets include 2008/09 capital expenditure.

Melbourne Water notes the Commission's approach to aligning asset utilisation with the depreciation profile and claiming depreciation on major assets when the asset enters service.

However, reflecting the working assumptions to be used in preparing the 2009 Water Plan, Melbourne Water has deferred depreciation of $135 million on new assets to the 2013 regulatory period. Melbourne Water expects the $135 million deferral of depreciation to be revenue neutral over the two regulatory periods. As set out in Chapter 6, to the extent that this working assumption is not revised in the Commission's draft and final decisions, Melbourne Water will seek a fixed principles commitment to both the recovery of the specified amount in the regulatory period starting 1 July 2013 and that this will occur in a net present value neutral manner.

Melbourne Water has concerns in relation to the use of an annuity approach. It does not believe it is appropriate for its renewals capital expenditure which can fluctuate over time, particularly given the lumpy nature of the renewals projects which depend on the age of the assets (see Chapter 10). Further, it considers that it would be problematic to adopt multiple depreciation methods for different types of assets, e.g. having one method for major assets and another for renewals expenditure.

12.3.2 Asset lives to be applied

Melbourne Water has calculated its depreciation forecasts using a straight line depreciation method (adjusted for $135 million deferral of depreciation) and the asset lives shown in Table 12.3. Asset lives have been determined on a weighted average basis for each product and program. An example is provided in Table 12.4, which illustrates that a weighted average is determined by multiplying individual asset lives by remaining accounting book values. The sum of the weightings are then divided by the total program asset lives. Different weighted average asset lives are applied to the opening Regulatory Asset Values as compared to new assets. This is necessary because of the different characteristics of existing and new assets.

Table 12.3: Asset lives (years)

Program	Opening RAV 2009 regulatory period	New assets
Water Production and Storage	94	124
Water Quality	21	28
Water Transfer	128	104
Sewerage Treatment	33	33
Sewerage Transfer	67	137
Recycled Water	33	30
Corporate	21	20
Total weighted average	**73**	**73**

Table 12.4: Example of a weighted average asset life calculation

Asset number	Program	Remaining asset life	Written down book value	Weighted (Remaining asset life x Written down book value)
1	Sewerage Treatment	23	1,000	23,000
2	Sewerage Treatment	20	10	200
3	Sewerage Treatment	80	500	40,000
4	Sewerage Treatment	10	600	6,000
	Total		**2,110**	**69,200**
	Total weighted average asset life			**33**

12.3.3 Depreciat ion allowance

Table 12.5 details the capital depreciation allowance forecasts for the 2009 regulatory period.

Table 12.5: Depreciation allowance forecasts

	Forecast Year Ending					
	09/10 $M	10/11 $M	11/12 $M	12/13 $M	Total $M	NPV $M
Opening RAV 2009 regulatory period	73.5	73.5	73.5	73.5	294.0	263.4
New assets						
Water Production and Storage	5.7	7.7	8.4	8.6	30.4	26.9
Water Quality	3.9	4.3	4.5	4.8	17.5	15.6
Water Transfer	0.6	1.1	1.5	1.8	5.0	4.5
Sewerage Treatment	8.2	15.0	20.0	21.9	65.1	57.0
Sewerage Transfer	1.6	2.6	3.5	4.0	11.7	10.3
Recycled Water[106]	-	-	-	-	-	-
Corporate	2.4	3.0	3.5	3.8	12.7	11.2
Depreciation deferral	-20.5	-31.2	-39.3	-44.0	-135.0	-118.9
Total	75.4	76.0	75.6	74.4	301.4	270.0

[106] Capital depreciation allowance for recycled water is immaterial.

12.3.4 Taxation

Under the Commission's approach to determining the revenue requirement, businesses are able to directly recoup the cost of company tax during the regulatory period. The Commission prescribes a calculation for benchmark tax liability that allows Melbourne Water to recoup a benchmark company tax cost.

The benchmark tax liability is based on Melbourne Water's revenue forecasts, less allowable deductions for operating expenditure, interest, tax depreciation and franking benefit. This represents around 2% of Melbourne Water's total revenue requirement.

In the 2005 regulatory period Melbourne Water did not have a benchmark tax liability due to tax depreciation allowance being able to fully offset the tax liability. A significant number of large assets will be fully depreciated for tax purposes at the start of the 2009 regulatory period, which will increase Melbourne Water's benchmark tax liability relative to the 2005 regulatory period, thus increasing the required revenue.

It is noted that the working assumptions used to prepare the 2009 Water Plan mean that Melbourne Water's benchmark tax liability is lower than it would otherwise be. This will need to be taken into account in the event that these assumptions are revised.

Chapter 13

Revenue requirement

Over the 2009 regulatory period, Melbourne Water's smoothed revenue requirement for water and sewerage services is $2,857 million.[107]

For the retail water businesses this corresponds to an average water and sewerage price increase of CPI + 21.9% per annum over the 2009 Water Plan. Western Water's and Gippsland Water's water prices will increase on average by CPI + 24.5% and CPI + 16.4% per annum respectively.

The smoothed revenue requirement and the associated price increases for retail water businesses reflect the working assumptions provided by the Minister for Water for preparing the 2009 Water Plan.

13.1 Summary

Melbourne Water supports the use of the building block approach for the 2009 regulatory period.

Melbourne Water has undertaken a building block analysis to determine its revenue requirement for each year of the 2009 regulatory period. Melbourne Water's raw and smoothed revenue requirements are shown in Table 13.1.

Table 13.1: Revenue Requirement

	Forecast Year Ending					
	09/10 $M	10/11 $M	11/12 $M	12/13 $M	Total $M	NPV $M
Melbourne Water's **raw** revenue requirement[108]	606.2	653.4	880.9	1,098.7	**3,239.2**	**2,856.9**
Melbourne Water's **smoothed** revenue requirement	573.9	713.6	879.4	1,071.3	**3,238.2**	**2,856.9**

Melbourne Water has analysed the implications of the smoothed revenue requirement for the financial viability and sustainability of its business:

- The revenue level will maintain (at a minimum) the shareholder's financial interest in the business over the long term (assuming that prices will be increased in subsequent regulatory periods reflecting the revenue requirement generated by rolling-forward the regulatory asset value)

[107] This includes miscellaneous revenue for water, sewerage and recycled water services of $25 million.

[108] The Net Present Value of Melbourne Water's total raw and smoothed revenue requirements are equivalent, however this means there are some small differences in the total raw and smoothed revenue requirements.

- A lower revenue requirement would potentially impact on Melbourne Water's ability to meet its regulatory and customer service obligations as well as to provide an acceptable return to its shareholder.

13.2 Revenue requirements

13.2.1 Raw revenue requirements

Melbourne Water's indicative raw revenue requirements are set out in Table 13.2.

Table 13.2: Raw Revenue Requirement

	Forecast Year Ending 09/10 $M	10/11 $M	11/12 $M	12/13 $M	Total $M	NPV $M
Return on capital assets in place 1 July 2008	233.1	228.8	224.6	220.3	906.8	812.8
Depreciation of assets in place 1 July 2008	73.5	73.5	73.5	73.5	294.0	263.4
Return on new assets[109]	81.6	121.1	145.2	156.7	504.6	445.4
Depreciation of new assets[110]	1.9	2.5	2.1	0.9	7.4	6.6
Operating expenditure	197.6	209.2	415.5	627.7	1,450	1,260.6
Benchmark tax liability	18.5	18.3	20.0	19.6	76.4	68.3
Raw revenue requirement	606.2	653.4	880.9	1,098.7	**3,239.2**	**2,856.9**

This raw revenue requirement has been developed based on the building block cost components set out in this 2009 Water Plan.

13.2.2 Smoothed revenue requirements

Melbourne Water agrees that the Commission's net present value approach for calculating the amount by which prices deliver the raw revenue requirement over the regulatory period is an appropriate approach. Using this approach, Melbourne Water's smoothed revenue requirement over the 2009 regulatory period is shown in Table 13.3. The resulting price increases (the X factor) from 2009/10 are also shown in Table 13.3.

[109] New assets include 2008/09 capital expenditure.

[110] Depreciation on new assets includes $135 million deferral of depreciation to the next regulatory period.

Table 13.3: Proposed Smoothed Revenue Requirement[111]

		Forecast Year Ending					
		09/10 ($M)	10/11 ($M)	11/12 ($M)	12/13 ($M)	Total ($M)	NPV ($M)
Melbourne Water's proposed revenue requirement for water and sewerage services		573.9	713.6	879.4	1,071.3	**3,238.2**	**2,856.9**
Average annual X factor Retail water businesses	21.9%						
Average annual X factor Western Water	24.5%						
Average annual X factor Gippsland Water	16.4%						

13.2.3 Financial viability

In approving its revenue requirement, the Commission needs to consider the *Essential Services Commission Act 2001* objective of maintaining Melbourne Water's financial viability. Melbourne Water agrees with the Commission that its decision should be based on Melbourne Water achieving at least a BBB+ investment grade credit rating (say, using the Fitch's credit rating methodology).

[111] Proposed revenue requirements include miscellaneous revenue.

Chapter 14

Prices

The proposed price structures for water and sewerage continue the reform processes commenced in the 2005 regulatory period.

Individual price caps are proposed for water, sewerage volume and sewerage pollution load prices.

Pricing principles are proposed for recycled water services. Prices for planned and current recycled water schemes are proposed to ensure full cost recovery except where projects are related to meeting specific obligations.

This chapter sets out the proposed prices for water and sewerage services and pricing principles for recycled water for the 2009 regulatory period. These prices recover the required revenues detailed in Chapter 13. The chapter also details the current prices and how the proposed prices differ from those in place during the 2005 regulatory period. It provides details on the underlying cost justification for the proposed prices and discusses how the prices may impact upon customers and change customer behaviour.

Appendix 5 provides the price schedule setting out the proposed prices in 2009/10 for water and sewerage services and proposed pricing principles for recycled water.

14.1 Principles

Clause 14 of the *Water Industry Regulatory Order* sets out the matters that must be taken into account in setting prices. In particular prices must:

- Provide appropriate signals to customers about the costs of providing particular services and choices regarding alternative supplies for different purposes
- Take into account the interests of customers, including low income and vulnerable customers
- Enable customers to understand the prices charged
- Be consistent with a sustainable revenue stream for the business.

The proposed prices comply with these regulatory principles and, in particular, are consistent with encouraging further water conservation over the 2009 regulatory period.

14.2 Overview

In the Commission's September 2008 *Supplementary Guidance on Water Plans* it notes that businesses' Water Plans should clearly express the proposed price increases in terms of the outcomes and programs they are proposing to deliver, for example, by showing how each component of its regulatory requirement contributes to its proposed average annual price increase.

Melbourne Water's proposed average annual price increase for the retail water businesses (of 21.9%) reflects the expenditures required to meet the obligations and requirements set out in Chapter 7, as well as the forecast water demands and sewage flows and loads outlined in Chapter 8. It also reflects the working assumptions provided by the Minister for Water for preparing the 2009 Water Plan, including the Weighted Average Cost of Capital. Table 14.1 sets out the major projects and factors that are contributing to this proposed average annual price increase. Significant in this regard are:

- The payment obligations in relation to the Victorian Desalination Project
- Construction of the Sugarloaf Pipeline and contributions to the Food Bowl Modernisation Project
- Proposed capital expenditure on a small number of other large scale projects (e.g. the upgrade at the Eastern Treatment Plant to tertiary treatment, the Northern Sewerage Project and the Melbourne Main Sewer) as well as a large number of smaller scale projects
- Reduced water demands and sewage flows and loads
- A higher Weighted Average Cost of Capital.

Table 14.1 – Components of Melbourne Water's proposed price increase

Driver		Price increase
Major Projects (capex and opex)	Sustainable Water Strategy	
	– Victorian Desalination Project	6.7%
	– Sugarloaf Pipeline	3.1%
	– ETP tertiary treatment	0.8%
	– Tarago treatment plant	0.7%
	Sewerage Spills	
	– Northern Sewerage Project	1.0%
	– Melbourne Main Sewer Project	0.4%
Land Tax		0.6%
Other Opex		1.1%
Other Capex		3.7%
Demand Reduction		4.8%
WACC (from 5.2% to 5.8%)		3.0%
Benchmark tax payable		1.0%
Regulatory Asset Value transfer of $300 million		-1.7%
Deferring depreciation by $135 million		-2.0%
2008/09 revenue requirement shortfall		-1.3%
Total		**21.9%**

14.3 Setting bulk water and sewerage prices

Melbourne Water has set its bulk water and sewerage prices on a similar basis as for the 2005 Water Plan using a four stage process:

1. The total required revenue for the service is established
2. Each retail water business's share of the total revenue requirement is identified, based on their use of Melbourne Water's systems
3. Each retail water business's service and usage prices are established. Usage based prices (i.e. variable prices) are calculated based on long run marginal cost, thereby providing customers with signals as to the cost of accommodating a change in demand and informing investment and system use decisions. Service prices (i.e. fixed prices) are calculated as the difference between each retail water business's share of Melbourne Water's total revenue requirement and the revenue expected to be raised through usage prices.
4. Each of the metropolitan retail water businesses' shares of revenue shortfall associated with achieving the State Government's recycled water objectives is included in the relevant water and sewerage prices.

Further detail in relation to the basis for setting the bulk water and sewerage prices is provided in Appendix 8.

Changes in proposed prices are driven by:

- The increasing revenue requirement discussed in Chapter 13
- Revisions to the approach to determining each retail water business's share of Melbourne Water's total revenue requirement
- Refining both the methodology and in some cases the specification of usage prices to better reflect underlying costs and thus provide more appropriate incentives for behavioural change.

The overarching aim of these reforms is to provide more cost reflective prices that give clearer signals for sustainable resource use and investment. Melbourne Water has developed the proposed prices in consultation with the retail water businesses, worked towards agreed principles and methodologies and explored options for managing customer impacts. The proposed price reforms will result in changes in customer bills.

14.4 Bulk Water prices

14.4.1 Current prices

Melbourne Water's current bulk water prices comprise of two components – a service price for service availability and a usage price applying to the volume of water used. From 2006/07, these prices were unbundled to create separate service and usage prices for both the headworks and transfer elements of the water system. This was undertaken to increase transparency around the costs associated with these network elements and to support the potential future trading of bulk water entitlements.

As noted above, prices are cost reflective:

- Usage prices are reflective of the long-run marginal cost of supply for network elements
- Service prices are calculated as the difference between Melbourne Water's revenue requirement and the expected revenue from usage prices.

The water prices applying in 2008/09 are shown in Table 14.2.

Table 14.2: Water prices for 2008/09[112]

	Service Price ($/Month)		Usage Price ($/ML)	
Retailer	**Headworks**	**Transfer**	**Headworks**	**Transfer**
City West Water	42,098.13	23,847.23	181.37	469.03
South East Water	1,766,414.28	1,000,617.37	181.37	146.14
Yarra Valley Water	2,170,051.29	1,229,264.86	181.37	111.77
Western Water	42,106.29	23,851.85		
≤ 5,000ML per annum			123.06	352.18
> 5,000ML per annum			123.06	510.10
Gippsland Water	1,198.77	359.63	43.82	–

Service prices are billed monthly in advance and usage prices are billed weekly in arrears.

14.4.2 Proposed prices

Melbourne Water proposes to maintain the current pricing structure for the unbundled headworks and transfer water prices. This will continue to facilitate any evolution of State Government policy objectives around water trading, by enabling greater transparency in relation to the cost of the headworks and transfer elements of the water system. It is also consistent with the preferences of the retail water businesses and continues to provide improved information to assist water supply/demand planning and investment decisions.

The State Government decided in *Our Water, Our Future* that bulk water entitlements would be assigned to the retail water businesses as a pool and that trading would be permitted between the pool and other water entitlement owners. The various bulk water entitlements have now been transferred to the retail water businesses and, as part of this, they are required, along with Melbourne Water, to propose amendments to the bulk entitlements that would achieve a long-term supply-demand balance for the Melbourne supply system with the least economic, environmental and social costs. This includes the possibility of disaggregating the pooled entitlements to enhance further water trading within metropolitan Melbourne.

[112] Prices are expressed in 2008/09 dollars.

The current unbundled price information assists businesses and other interested parties to make better decisions when considering the implications of selling or acquiring bulk water entitlements (including the costs associated with storing, treating and transferring the water). The exact form of any trading market is, however, still unknown and this may necessitate further adjustments or unbundling of prices.

Importantly, the unbundling of prices may also assist in comparing supply side augmentations and demand side management programs. In an environment of constrained supply, this will be particularly useful as it is increasingly necessary to ensure that the optimal mix of supply side investments and demand side management programs are put in place.

The level and structure of the proposed headworks and transfer prices for the 2009 regulatory period are detailed in Table 14.3. These prices will continue to reinforce water conservation signals and are broadly cost reflective, as outlined in section 14.4.3 and Appendix 7 and 8.

Table 14.3: Water prices for 2009/10

	Service Price ($/Month)		Usage Price ($/ML)	
Retailer	**Headworks**	**Transfer**	**Headworks**	**Transfer**
City West Water	1,693,557	461,904	460	133
South East Water	2,302,747	859,212	460	113
Yarra Valley Water	2,568,244	1,225,112	460	90
Western Water	159,329	79,987	460	89
Gippsland Water	95	669	95	–

As can be seen in Table 14.3, it is proposed that there will be one usage price for headworks for all of the retail water businesses. This reflects the fact that businesses benefit from security of supply provided by the headworks system as a whole. Gippsland Water is the exception to this, as it only takes untreated water from Tarago Reservoir and does not receive security of supply benefits from the entire system. For this reason, a separate headworks usage price is proposed for Gippsland Water.

There are separate usage prices for each retail water business for the transfer system. This reflects each business's different usage of the transfer system and that future expenditures by Melbourne Water in meeting forecast growth in water demand will occur in different parts of the transfer system.

In the 2009 regulatory period, the funding shortfall attributable to recycled water projects will not be recovered via the unbundled water prices. Rather, it will be recovered via sewerage prices. See section 14.5.2 and 14.7.3 for further detail.

It is proposed that service prices will be billed monthly in advance and usage prices be billed weekly in arrears, consistent with current arrangements.

14.4.3 Underlying cost justification

As noted above, the guiding principle in establishing bulk water prices is that they should be cost-reflective, taking into account customer impacts. For bulk water usage prices, the key driver of long-run marginal cost is forecast growth in annual water demand and any resulting augmentations necessary to meet this growth. For bulk water service prices, the key drivers of average cost are peak water demand, asset condition, customer service standards, water quality guidelines, environmental standards and geological and topographical conditions.

Usage prices

Usage prices are a key mechanism for signalling future marginal costs and influencing customer behaviour. The proposed usage prices detailed above are, in general, reflective of the long-run marginal cost associated with Melbourne Water's headworks and transfer systems. That is, the capital and operating costs associated with the optimised response to a realistic increase in demand over a twenty year timeframe.

These optimised augmentations are established after a planning process, which involves consideration of a variety of potential measures and associated timings. For headworks, they are consistent with the augmentations detailed in the State Government's *Our Water Our Future: the Next Stage of the Government's Water Plan* (the State Government's Water Plan) and the *Central Region Sustainable Water Strategy* (CRSWS), including its low inflow planning scenarios.

The Commission's advice and preferred approach to determining long-run marginal cost is set out in its report *Estimating Long Run Marginal Cost, Implications for Future Water Prices*. The proposed usage prices for headworks and transfer are consistent with this approach and were developed using the long-run marginal cost models established by the Commission.

Service prices

The proposed service prices detailed above are based on the difference between each retail water business's share of Melbourne Water's revenue requirement for water and the expected revenue from the usage prices. In this regard, each retail water business' cost share of the revenue requirement is important. The Commission's 2005 Price Determination noted that Melbourne Water's existing cost allocation model was to be revised during the 2005 regulatory period, in consultation with the metropolitan retail water businesses and other relevant interested parties, to ensure that bulk water prices were set appropriately in the 2009 regulatory period.

Consistent with the expectations of the Commission, Melbourne Water, in consultation with the retail water businesses, including Western Water and Gippsland Water, revised its methodology for determining each retail water business's cost share of the revenue requirement.

The issue of cost allocation was subsequently reviewed by the Victorian Competition and Efficiency Commission in an inquiry into reform of the metropolitan retail water sector. In developing these prices, Melbourne Water has adopted the cost allocation approach consistent with the State Government's response to the Victorian Competition and Efficiency Commission's final recommendations. In particular, that Melbourne Water's:

- Sunk costs are allocated to the retail water businesses on the basis of 2004/05 volumes
- Future costs are allocated to the retail water businesses according to forecast volumes and pollutant loads, with the Eastern and Western Treatment Plants being treated separately.

The cost shares have not been revised since 1998 and updating them based on the above approach has caused changes in the relative shares. Additionally, since 1998, growth across metropolitan Melbourne has been concentrated in particular areas and as a result, the relative usage of bulk water services by some retail water businesses has increased while for other retail water businesses it has decreased. The cost shares are further impacted by future capital expenditure and the retail water businesses' relative usage of the resulting bulk water services from this expenditure.

This has seen South East Water's and Yarra Valley Water's cost shares for bulk water services increasing, while City West Water's cost share has decreased. The cost share of Western Water has also decreased while that of Gippsland Water has remained constant.

See Appendix 7 for further details in relation to the cost allocation process, customer issues and measures to manage customer impacts.

14.4.4 Changes in customer behaviour

Melbourne Water's proposed prices provide current and potential bulk water customers with improved information on which to make economically efficient system use and investment decisions. As discussed above, the proposed prices also facilitate a better understanding of economically desirable water trading opportunities (noting that details of any future water trading arrangements have not been resolved).

Given that the retail water businesses are familiar with this pricing approach and have been involved in the development of the proposed prices, they will be well placed to respond to the resulting price signals. Actions that could be taken in response to the proposed prices include:

- Inclusion of the proposed prices in their retail prices in order to send price signals to their customers
- Non-price measures such as customer education, incentives and regulation
- System measures such as leakage reduction.

Proposed responses will likely be set out in the retail water businesses' draft 2009 Water Plans.

14.5 Bulk sewerage

14.5.1 Current prices

Melbourne Water's current bulk sewerage prices comprise of two components – a service price for service availability and a series of usage prices applying to the sewage received. There are separate usage prices for the Western and Eastern treatment systems in relation to the volume of sewerage received and the following pollution load factors: Biological Oxygen Demand, Suspended Solids, Total Nitrogen and Total Dissolved Solids.

As for bulk water services, the prices are cost reflective:

- Usage prices are reflective of the long-run marginal cost of supply for network elements
- Service prices are calculated as the difference between Melbourne Water's revenue requirement and the expected revenue from usage prices.

The sewerage prices applying in 2008/09 are set out in Tables 14.4 and 14.5.

Table 14.4: Sewerage prices for 2008/09[113]

	City West Water	South East Water	Yarra Valley Water
Service price ($/month)	3,604,739.11	4,530,943.09	6,330,217.94

Table 14.5: Sewerage usage prices for 2008/09[114]

	Western system	Eastern system
Volume ($/ML)	76.92	142.24
Non-major trade waste load ($/ML)	60.81	210.79
Major trade waste load		
Biological Oxygen Demand ($/tonne)	38.57	295.11
Suspended Solids ($/tonne)	6.84	259.17
Total Nitrogen ($/tonne)	782.69	575.43
Total Dissolved Solids ($/tonne)	12.02	12.02

Service prices are billed monthly in advance and usage prices are billed weekly in arrears.

14.5.2 Proposed prices

Consistent with the Water Industry Regulatory Order requirements, the guiding principle for setting sewerage prices is that they should be cost reflective (i.e. provide signals about the cost of service). Sewerage prices are an important mechanism for signalling to the retail water businesses the costs and risks that Melbourne Water faces in accepting their waste. The current usage prices reflect the volume and chemical composition (the pollution load) of the sewage received at the Western and Eastern Treatment Plants, which are major drivers of Melbourne Water's costs.

[113] Prices are expressed in 2008/09 dollars.

[114] Prices are expressed in 2008/09 dollars.

Sewerage prices are also important in terms of sending signals about sustainable investment by Melbourne Water, retail water businesses and trade waste businesses as well as providing financial incentives for retail water businesses to minimise waste.

The 2009 Water Plan provides an opportunity to further refine the pricing approach developed in the 2005 regulatory period in order to provide sharper and more cost reflective price signals that will impact on retail water businesses and trade waste customer behaviour.

For the 2009 regulatory period, sewerage prices will recover the recycled water funding shortfall (see section 14.7.3 for more detail). This approach is consistent with application of the polluter pays principle as well as with Water Industry Regulatory Order principles for creating incentives for more efficient and sustainable resource use.

Usage prices – volume

There are currently two types of volume related prices, one for the volumes received at the Eastern and Western Treatment Plants and the other for the non-major trade waste load received at the Eastern and Western Treatment Plants. The costs of transferring and treating non-major trade waste load are recovered via a volume based price as there is no individual monitoring of non-trade waste loads (from residential and non-industrial customers) and the benefits of sending load price signals to non-trade customers are likely to be minimal.

There was some customer confusion in relation to this current charging structure, which is also used to bill the retail water businesses. It is therefore proposed to simplify the usage pricing approach for the 2009 regulatory period by establishing a single volume based usage price for each plant. The price structure for the Eastern and Western Treatment Plants will reflect the growth related costs associated with:

- The transfer and treatment of volume
- The transfer and treatment of load that is not related to major trade waste customers.

Melbourne Water considers that this will make the volumetric usage prices easier to understand while they continue to be cost reflective. It will, however, continue to provide the retail water businesses with a breakdown of the proposed price into the volume and non-trade waste load components.

It is proposed that Melbourne Water will continue charging each retail water business weekly in arrears for the volume of sewage received.

Usage prices – trade waste load

A key issue for setting pollution load prices is which load parameters should be priced. Since the 2005 Water Plan and the Commission's 2005 Price Determination, Melbourne Water has further considered and consulted on the most appropriate load parameters in terms of the:

- Impact on expected future capital and operating costs including certainty of future requirements as well as the magnitude and timing of the expenditure required
- Policy significance (e.g. impact on ability to meet the State Government's water recycling targets)
- Capacity to be measured reliably
- Level of support by the retail water businesses
- Potential to lead to improved customer decisions.

It is proposed that pollution load prices be applied to the amount of Biological Oxygen Demand, Suspended Solids, Total Kjeldahl Nitrogen and Inorganic Total Dissolved Solids provided by each retail water business's major trade waste customers on a monthly basis.

Biological Oxygen Demand and Suspended Solids

These parameters are still considered to be appropriate, as they remain key licence requirements for effluent quality at both the Eastern and Western Treatment Plants. Over the 2009 regulatory period, Melbourne Water will retain a price for Biochemical Oxygen Demand but review the potential to replace it with a price for Chemical Oxygen Demand as part of the 2013 regulatory period to improve accuracy and cost reflectivity.

Nitrogen and ammonia discharges

Nitrogen discharges are subject to licence requirements at the Western Treatment Plant while ammonia discharges are subject to a licence requirement at both the Western and Eastern Treatment Plants. Total Kjeldahl Nitrogen, rather than Total Nitrogen, is considered the most appropriate load parameter as it more closely reflects the drivers of significant future capital and operating costs associated with meeting these discharge requirements.[115] It can also be measured with greater accuracy than Total Nitrogen. The possibility of refining this load parameter from Total Nitrogen to Total Kjeldahl Nitrogen was raised in the 2005 Water Plan and is broadly supported by the retail water businesses.

Salinity

Melbourne Water is proposing to continue charging a salt price in the 2009 regulatory period as salinity restricts opportunities associated with water recycling (driven in the short term by the State Government's target to recycle 20% of Melbourne's effluent by 2010 and over the medium term by the water supply/demand balance). Further, to maximise the reuse of treated effluent, EPA Victoria has required Melbourne Water to ensure that the concentration of salt in the untreated sewage it receives at its Western Treatment Plant does not exceed a median concentration of 1000 milligrams per litre by 2009.

Several alternatives to the current measure of Total Dissolved Solids were considered, including Electrical Conductivity, Inorganic Total Dissolved Solids and sodium. In the 2009 regulatory period it is proposed to move to Inorganic Total Dissolved Solids despite retail water businesses not proposing to include these prices in their 2009 Water Plans.

Introducing Inorganic Total Dissolved Solids will:

- Address concerns raised by customers in relation to double counting between Total Dissolved Solids and Biological Oxygen Demand
- Create more meaningful pricing signals for industry as to the factors limiting greater use of recycled water.

There is ongoing debate about which of the compounds contributing to salinity levels are more important to target in terms of pricing. To a large extent this depends on the end-use of the recycled water, particularly where that end-use is agricultural. For example, Inorganic Total Dissolved Solids affects the osmotic capacity of plants (the ability of plants to draw up water from the soil), whereas sodium has more of an impact in relation to phytotoxicity and soil structure.

Conversely, reuse in industrial applications is driven by reductions in Inorganic Total Dissolved Solids (and possibly other specific components contributing to Inorganic Total Dissolved Solids such as calcium which causes scaling in equipment), whereas sodium in its own right does not appear to be a particular concern. While it will be important to

[115] Total Nitrogen is Total Kjeldahl Nitrogen plus nitrates and nitrites.

target sodium loads, and send appropriate pricing signals, it will also be important to target Inorganic Total Dissolved Solids with the aim of reducing salinity in its entirety to meet electrical conductivity, Total Dissolved Solids, sodium, and sodium absorption ratio requirements.

The shift from charging for Total Dissolved Solids to Inorganic Total Dissolved Solids is seen as a natural first step as there is industry-wide data available for Inorganic Total Dissolved Solids as compared to sodium. Therefore, it should be readily achievable at both the bulk and retail levels and result in a more targeted price.

Currently there is limited industry-wide data available about sodium levels. It is therefore proposed that introduction of a sodium price (in addition to the Inorganic Total Dissolved Solids price) be considered further during the 2009 regulatory period, with possible implementation in the following regulatory period. This will enable industry-wide data to be collected, studies to be undertaken in order to better understand at-source sodium contributions, the associated cost of acceptance and treatment to be analysed and consultation to occur with industry about the introduction of a price. Ways in which to address the potential double counting issues created by having Inorganic Total Dissolved Solids and sodium prices will be investigated.

This refinement was also raised in the 2005 Water Plan and broadly has the support of retail water businesses.

Melbourne Water proposes to increase its current salt price to better signal the future cost of growth in salt loads and increase the rewards associated with salt load reductions. Mindful of customer impacts, it has proposed to transition to this cost reflective price over the 2009 and 2013 regulatory period.

While Melbourne Water does not currently remove salt from recycled water, existing salinity levels restrict recycling opportunities. Charging for salt discharges increases incentives for retail water businesses to use price and non-price measures (e.g. cleaner production initiatives and investment in lower saline infiltration) to reduce their salt discharges, enabling future investment in recycled water desalination to be deferred or downsized.

The increased salt price does not result in Melbourne Water earning more revenue overall, as it recovers costs that would have otherwise been recovered via fixed monthly service prices. However, it does give retail water businesses more opportunity to influence the size of their bills by reducing salt loads. This approach is consistent with achieving the State Government's and EPA Victoria's expectations in relation to water recycling and application of the polluter pays principle. It is also consistent with Water Industry Regulatory Order principles to create incentives for more efficient and sustainable resource use.

The proposed salt price has increased significantly compared to the price in the 2005 regulatory period, meaning salt charges will comprise a larger portion of retail water businesses' sewerage bills, although still a relatively small component of overall bills. If retail water businesses were to include these prices in their 2009 Water Plans and pass this price signal on to end customers, some end customer's salt bills would increase significantly. Melbourne Water proposes to manage the customer impacts by transitioning towards a cost reflective price, with the proposed increase in 2009/10 being the first step in this process.

Further initiatives to promote more efficient and sustainable use of the sewerage system will be considered for the 2013 regulatory period.

The usage prices for each of the load parameters outlined above will reflect the growth related costs associated with augmenting the Western and Eastern Treatment Plants respectively.

Usage prices – metals and biosolids

EPA Victoria requires water businesses to move to sustainable management of biosolids, including reuse. As discussed in Chapter 7, Melbourne Water continues to assess and develop options for reuse of biosolids, including as a part of the energy recovery project and as construction fill in road projects.

The presence of heavy metals in biosolids may limit these and other reuse opportunities given removal of these metals may be a significant driver of future costs. Of particular concern, to varying degrees, are mercury, cadmium, copper, nickel and zinc. Reducing the extent of these metals in biosolids can be achieved in a variety of ways, including through partnership and cleaner production approaches, the use of pricing signals and tighter regulation.

Melbourne Water investigated the possibility of developing usage prices for those heavy metals that limit biosolids reuse and developed a proposal for the 2009 regulatory period that was put to the retail water businesses. The proposal was not supported by the retail water businesses on the basis that:

- Pricing would not provide a useful signal for at source reduction
- It would undermine current partnership and cleaner production approaches
- It would not be practical, particularly given a lack of available meaningful heavy metals data.

At this stage, and for the 2009 regulatory period, Melbourne Water acknowledges that metals pricing may not be the most appropriate approach to reducing the extent of heavy metals in biosolids. Melbourne Water considers, however, that the presence of heavy metals in biosolids that limit reuse opportunities is an issue that needs to be addressed.

Melbourne Water will not implement metals pricing over the 2009 regulatory period on the understanding that the retail water businesses will:

- Implement partnership and cleaner production initiatives with trade waste customers
- Implement management plans
- Establish data collection arrangements for heavy metals contained in sewerage loads from major trade waste customers. This information should then be used to inform the success or otherwise of the partnership and cleaner production approaches and, if necessary, could be used for pricing purposes in the following regulatory period.

Service prices

In the 2009 regulatory period it is proposed that the service prices for the availability of the treatment and transfer systems should be further unbundled in order to provide separate prices for the western and eastern systems for each retail water business. This will ensure that there are clear signals about the cost of supplying services via each of these systems, which are quite different in terms of treatment processes.

It is proposed that service prices will continue to be billed monthly in advance.

Summary of the proposed bulk sewerage prices

In summary, the proposed changes in the tariff structures since the 2005 regulatory period are:

- Changed volumetric usage prices
- Changed usage price load parameters – Total Kjeldahl Nitrogen will replace Total Nitrogen and Inorganic Total Dissolved Solids will replace Total Dissolved Solids
- Changed service prices for system availability.

The level and structure of the proposed bulk sewerage prices for the 2009 regulatory period are set out in Tables 14.6 and 14.7.

Separate service prices are proposed for the western and eastern systems, which in aggregate have increased slightly since the 2005 regulatory period. The proposed usage prices at both the Western and Eastern Treatment Plants are broadly of the same magnitude as in the 2005 regulatory period. The variations largely reflect the extent of capital works occurring at the two plants to address growth. For example, the proposed price for Biological Oxygen Demand at the Western Treatment Plant is lower in the 2009 regulatory period reflecting the fact that there are no capacity issues and, as a result, no growth related augmentations are planned. The proposed price for Total Kjeldahl Nitrogen at Eastern Treatment Plant is higher reflecting the capacity constraints that exist over a 20 year timeframe and planned growth related augmentations.

Table 14.6: Sewerage service prices 2009/10

	City West Water	South East Water	Yarra Valley Water
Service price – Western System ($/month)	3,541,826	685,064	1,906,083
Service price – Eastern System ($/month)	–	4,692,249	3,998,400

Table 14.7: Sewerage usage prices for 2009/10

	Western system	Eastern system
Volume ($/ML)	177	284
Biological Oxygen Demand ($/tonne)	10	342
Suspended Solids ($/tonne)	2	189
Total Kjeldahl Nitrogen ($/tonne)	167	707
Inorganic Total Dissolved Solids ($/tonne)	24	24

14.5.3 Underlying cost justification

As noted above, the guiding principle in establishing sewerage prices is that they should be cost-reflective, taking into account customer impacts and administrative feasibility (including availability of data).

For bulk sewerage usage prices, the key driver of long-run marginal cost is forecasted growth in annual sewerage demand and any resulting augmentations necessary to meet this growth. For bulk sewerage service prices, factors influencing the average cost include: peak sewage flows, pollutant loads, environmental standards, customer service standards, asset condition, the distance over which sewage has to be moved and geological and topographical conditions.

Usage prices

Usage prices are a key mechanism for signalling future marginal costs and influencing customer behaviour. The proposed usage prices detailed above are, in general, reflective of the long-run marginal cost associated with Melbourne Water's western and eastern transfer and treatment systems. Long-run marginal cost is determined by the capital and operating costs associated with the optimised response to an increase in demand over the 20 years from 2009.

These optimised augmentations are established after a planning process which involves the consideration of a variety of potential measures and the associated timings for delivery in order to ensure that the treatment and transfer systems have sufficient capacity to meet growth.

Proposed usage prices for Inorganic Total Dissolved Solids have been established taking into account long-run marginal costs and the need to manage customer impacts (see section 14.5.2). It is proposed that prices be set so that there is a transition over time towards a cost reflective price. The proposed price of $24 per tonne is a first step in this process.

As for water, the proposed usage prices for volume and load in the western and eastern systems are consistent with the Commission's preferred long-run marginal cost methodology. They were developed using the long-run marginal cost models established by the Commission.

Service prices

The service prices detailed above are based on the difference between Melbourne Water's revenue requirement for the western and eastern transfer and treatment systems respectively and the expected revenue from usage prices. Melbourne Water has revised the methodology for determining each retail water business's share of the revenue requirement using the same approach for water. The revised methodology is based on the agreed cost allocation principles noted in section 14.4.3. Appendix 7 provides further details of the cost allocation methodology.

This has seen South East Water's cost share for bulk sewerage services increase, while City West Water and Yarra Valley Water's cost shares have decreased.

14.5.4 Changes in customer behaviour

Melbourne Water is proposing to refine its pricing approach for sewerage to better reflect its cost drivers and to send clearer signals to its customers. It considers that the changes proposed do not complicate the tariff structures and that its customers will continue to have a good understanding of how these prices will interact with their consumption and investment decisions.

It is noted that Melbourne's vertically disaggregated industry structure means that its customers, the retail water businesses, manage the interface with trade waste and domestic sewage customers and enforce compliance with trade waste acceptance standards. Therefore, while Melbourne Water's prices impact on the retail water businesses, the ultimate ability to change the behaviour of end customers (trade waste and domestic) is dependent on the nature of the retail water business' prices and other initiatives they take. Melbourne Water can establish bulk prices but is reliant on the retail water businesses to pass those prices on and implement other appropriate initiatives to change customer behaviour.

14.6 Water and sewerage customer impacts and consultation

14.6.1 Customer impact issues

Tables 14.8 and 14.9 outline the customer impacts in 2009/10 as a result of moving to the prices proposed for water and sewerage. These are price impacts, as revenues are established by multiplying both the 2008/09 prices and the proposed prices for 2009/10 by the forecast demand for 2009/10.

Table 14.8: Customer impacts in 2009/10 of proposed prices – City West Water, South East Water and Yarra Valley Water

	City West Water		South East Water		Yarra Valley Water	
Revenue from prices	Current ($M/yr)	Proposed ($M/yr)	Current ($M/yr)	Proposed ($M/yr)	Current ($M/yr)	Proposed ($M/yr)
Total – water and sewerage	114.8	135.7	160.6	203.4	185.0	219.2
Change ($M)		20.9		42.8		34.2
Change (%)		18.2%		26.6%		18.5%

Table 14.9: Customer impacts in 2009/10 of proposed prices – Western Water and Gippsland Water

	Western Water		Gippsland Water	
Revenue from prices	Current ($M/yr)	Proposed ($M/yr)	Current ($M/yr)	Proposed ($M/yr)
Total – water	7.1	8.9	0.028	0.029
Change ($M)		1.8		0.001
Change (%)		24.5%		4.4%

The customer impacts in 2009/10 are driven by:

- The revised cost shares for the retail water businesses, as reflected in the cost allocation principles outlined in section 14.4.3 and the methodology outlined in Appendix 7
- The increased costs associated with provision of bulk water and sewerage services, including the large scale water augmentations detailed in the State Government's Water Plan and CRSWS
- The price path for later years in the 2009 regulatory period.

Beyond 2009/10, Melbourne Water is proposing a CPI+X price path for metropolitan retail water businesses, which will see prices increasing each year by 21.9%. Broadly, this ensures the price paths aligns with Melbourne Water's capital expenditure program and increases the incentives for the retail water businesses to promote water conservation in the years prior to water becoming available from the Victorian Desalination Project. It also enables some smoothing over the 2009 regulatory period of Melbourne Water's, and the retail water business's revenues.

Western Water's and Gippsland Water's proposed price paths are 24.5% and 16.4% respectively, reflecting their average, water only, price increase. However, the proposed headworks price path for Western Water is 21.9%, reflecting the common security of supply being provided to it and the other retail water businesses.

The proposed usage price for Inorganic Total Dissolved Solids has increased significantly compared to the price in the 2005 regulatory period, meaning salt charges will comprise a larger portion of retail water businesses' sewerage bills. If retail water businesses pass this price signal on to end customers, some end customer's salt bills will increase significantly. As noted above, Melbourne Water proposes to manage the customer impacts associated with setting higher prices by transition towards a cost reflective price, with the proposed increase in 2009/10 being the first step in this process.

14.6.2 Stakeholder consultation

In developing its proposed bulk water and sewerage charging structure and prices, Melbourne Water has consulted extensively with its customers and the Department of Sustainability and Environment and the Commission.

A Bulk Water Pricing Group was established, including the retail water businesses, the Department of Sustainability and the Environment and the Commission. This group worked together in a collaborative fashion to consider the appropriate cost allocation principles.

Additionally, Melbourne Water consulted with the retail water businesses on the further unbundling of the headworks and transfer prices. Various options were explored before it was agreed to continue with the current structure.

Melbourne Water also consulted with the retail water businesses on the further refinement of the usage prices for sewerage volume and the load parameters. As detailed above, various options were explored with the retail water businesses, particularly in relation to alternative load parameters as well as the possibility of introducing metals pricing. The Trade Waste Steering Committee was also consulted on these issues. The retail water businesses have indicated their broad support for the proposed charging structure.

14.7 Recycled water tariff prices

14.7.1 Current prices

Melbourne Water charges recycled water retailers for the bulk supply of recycled water from its Eastern and Western Treatment Plants. There are two classes of recycled water currently supplied:

- Class C recycled water which is suitable for many agricultural, recreational and open space uses with on site management practices
- Class A recycled water, which has had further disinfection compared to Class C recycled water and is suitable for a greater range of uses. The Department of Human Services requires an extensive validation process for the recycled water treatment and supply system.

For the 2005 regulatory period, Melbourne Water adopted the following pricing principles set out by the Commission in establishing prices:

- Prices must be set so as to maximise revenue earned from recycled water services having regard to the price of any alternative substitutes and customers' willingness to pay
- Prices must include a usage component in order to provide appropriate signals to recycled water customers to manage resources
- Any revenue shortfall arising from schemes required to meet mandated targets will be recovered through bulk water charges to metropolitan retail water businesses.

Melbourne Water has Recycled Water Bulk Supply Agreements with retail water businesses for the supply of recycled water. Prices for agreements entered during the 2005 regulatory period have been commercially negotiated in light of the above principles, the willingness of customers to pay and the cost of supply. The Recycled Water Bulk Supply Agreements in place before commencement of the 2005 regulatory period have remained unchanged during the 2005 regulatory period.

14.7.2 Proposed prices

The wholesale recycled water services provided by Melbourne Water are unique and not homogenous in either requirements for quality or security of supply. The supply of these services has been, or will be, negotiated with well informed recycled water retailers (including the metropolitan retailers). Therefore Melbourne Water proposes to adopt the use of pricing principles, as detailed below, for all new or renewed Recycled Water Bulk Supply Agreements in the 2009 regulatory period. These principles are consistent with those noted in the Commission's September 2008 *Supplementary Guidance on Water Plans* and are similar to the principles adopted by Victorian water businesses as detailed in the Commission's *2008 Water Price Review* Final Decision. Recycled water services supplied under current Recycled Water Bulk Supply Agreements will continue to be priced in accordance with those agreements until their expiry.

The pricing principles proposed for adoption by Melbourne Water for the 2009 regulatory period are that:

- Prices should be set so as to have regard to the price of any substitutes and customers' willingness to pay
- Prices should cover the full cost of providing the service (with the exception of services related to specified obligations or maintaining balance of supply and demand)
- Prices must include a usage component in order to provide appropriate signals to recycled water customers to manage resources
- Any revenue shortfall arising from recycled water schemes required to meet specified obligations, e.g. mandated targets, or to maintain balance of supply and demand, will be recovered through bulk charges to the metropolitan retail water businesses.

In relation to the fourth principle, it is proposed that over the 2009 regulatory period, the anticipated revenue shortfall be recovered from sewerage prices. This is consistent with the principle of polluter pays and the fact that sewage salinity is constraining recycled water opportunities.

14.7.3 Underlying cost justification

All current and planned recycled water projects supplied by Melbourne Water are to meet specified State Government obligations except for two projects.[116]

Melbourne Water aims to achieve full cost recovery from recycled water charges as much as possible for each new or renewed recycled water project. Melbourne Water will charge full cost recovery for discretionary projects in the 2009 regulatory period, consistent with proposed pricing principles. Full cost recovery encompasses the recovery of project specific costs, a share of costs for shared assets utilised and a share of corporate overhead costs. Project specific costs are dependent on the requirements and specifications for the recycled water scheme.

Funding shortfalls arise in respect of existing and planned recycled water projects that are not financially viable on a commercial basis, but are undertaken to meet the State Government's targets of providing environmental, social and economic benefits to the community.

The forecasted funding shortfalls for existing and planned projects over the regulatory period have been calculated as the difference between the recycled water revenue requirement and the anticipated income for all recycled water projects. The revenue requirement is based on the building block approach to costs and includes the return on and of past capital investments as well as capital and operating expenditures for the 2009 regulatory period.

Table 14.10 sets out the forecasted funding shortfall over the regulatory period.

Table 14.10: Forecast funding shortfall 2009/10 to 2012/13

	Estimated Funding Shortfall			
	2009/10 ($M)	2010/11 ($M)	2011/12 ($M)	2012/13 ($M)
Total	6.1	5.9	5.5	5.3

[116] Supply to City West Water for MacKillop College and Standpipe drought relief are outside mandatory targets i.e. both are discretionary projects.

In the 2005 regulatory period, the funding shortfall was solely recovered from bulk water prices based on the beneficiary pays principle. Further to the pricing approach set out in section 14.5.2 for the 2009 regulatory period, it is proposed that the funding shortfall be recovered via bulk sewerage prices, based on a 'polluter pays' principle. The proposed recovery of the total shortfall from the metropolitan retail water businesses over the regulatory period is given in Table 14.10. Cost recovery from each metropolitan retailer would be in proportion to their sewage volumes and loads over the 2009 regulatory period.

14.7.4 Changes in customer behaviour and customer impact issues

With continuing drought and the maturing of recycled water projects there is increasing acceptance and support from the community about recycled water usage, especially as it is not subject to the same restrictions as potable water use. The use of recycled water is now seen as a logical part of the supply and demand strategy. New and higher value uses are being investigated, implemented or proposed for recycled water including plans for dual pipe and industrial projects.

Cost is a significant issue for some customers particularly where cheaper supply from alternative sources of water such as river or ground water may be available. The proposed pricing principles provide flexibility to set prices that encourage recycled water use by balancing cost reflectivity with capacity to pay, the price of alternative water sources and the broader community benefits of achieving mandated recycle water targets.

14.7.5 Stakeholder consultation

Melbourne Water works closely with the Melbourne retail water businesses to maximise water recycling opportunities from the Western Treatment Plant and Eastern Treatment Plant. This work includes the ongoing operation of existing schemes to achieve the water recycling target and implementing projects recommended by the 2008 Melbourne Reuse and Recycling Plan, which is prepared jointly by the Melbourne water businesses.

During project investigation and the finalisation of Recycled Water Bulk Supply Agreements, there has been extensive consultation between Melbourne Water as the bulk supplier, the recycled water retailers, customers and other stakeholders to determine contractual and regulatory requirements.

14.8 Miscellaneous prices

Melbourne Water is primarily a water resource manager providing water, sewerage and recycled water services to the retail water businesses. The range of related miscellaneous services provided direct to the public (that are not related to Melbourne Water's waterways and drainage function) is quite limited. The charges for these services essentially consist of bird watching permit fees at Western Treatment Plant and tour group fees for organised tours of Eastern Treatment Plant and Western Treatment Plant.

Consistent with the approach outlined by the Commission in its March 2007 *Guidance Paper*, Melbourne Water proposes that these prices should not be subject to the annual price approval process, but rather be non-scheduled miscellaneous prices that are set consistent with pricing principles.

The pricing principles proposed are consistent with those outlined in the Commission's March 2007 *Guidance Paper*. Specifically, that non-scheduled miscellaneous prices should be set such that they:

- Reflect the direct costs of service provision (including materials and costs associated with contractors)
- Reflect the internal costs incurred by the water businesses such as labour, transport and general overheads
- For new miscellaneous services, exclude costs previously accounted for in approved prices
- Are transparent.

14.9 Form of price control

At this stage, Melbourne Water proposes to use individual price caps for water, sewerage and sewerage loads over the 2009 regulatory period. This continues the approach used during the 2005 regulatory period and means that each of the prices approved by the Commission will be escalated annually by applying the 'CPI+/-X' formula.

In addition, Melbourne Water proposes to continue to use the proposed pricing principles for recycled water services.

14.10 Adjusting prices

As already noted in Chapter 6, Melbourne Water considers it important that the regulatory framework should ensure there are sufficient mechanisms to enable retail water businesses to deal with any significant risks and uncertainties that may arise over the 2009 regulatory period including those around demands, obligations and major capital projects.

In particular, Melbourne Water believes that there should be sufficient flexibility for prices to adjust within and at the end of the 2009 regulatory period. In order to adequately manage uncertainty and ensure optimal risk allocation, the regulatory framework needs to incorporate the following features:

- For certain, specified major but particularly uncertain projects, a within-period review and pass through process should be established to examine the costs of those projects for inclusion in relevant prices
- A cumulative, end-of-period, pass through mechanism should exist for unforseen, additional and new legislative or regulatory obligations arising once the 2009 regulatory period has commenced. This should be symmetrical in application[117] and have a materiality threshold of 1% of revenues (currently at 2.5% of revenues)
- An annual assessment of actual demands should occur to establish whether there are material variations with the demand estimates used by the Commission in its final decision, along with necessary adjustments to prices to ensure that the revenue requirement specified in the Commission's final decision is recovered.

[117] That is, apply to increases and decreases in costs arising from additional and new legislative or regulatory obligations.

Chapter 15

Non prescribed services

Melbourne Water undertakes a number of value adding, non prescribed services.

Although the Commission does not regulate non prescribed services, it needs to be satisfied that they are correctly classified to avoid regulated costs being under or overstated. Melbourne Water manages these services so that their costs and revenues are appropriately ring fenced and do not impact on the quality of prescribed services.

15.1 Summary

Overall non prescribed services are expected to contribute $142.4 million[118] or 4% to Melbourne Water's business revenue over the 2009 regulatory period.

Table 15.1 sets out the major components for non prescribed services. The Werribee Agriculture Group (WAG) is Melbourne Water's largest non prescribed activity, representing 92% of non prescribed revenue.

Changes in sewage treatment processes at Western Treatment Plant have permitted the lifting of restrictions on cattle trading. The improved trading and breeding conditions will result in higher WAG revenue.

The forecast revenues and expenditures for WAG are based on business as usual operations. However, these numbers may change significantly as a result of the planned outsourcing of Melbourne Water's agricultural operations to the private sector.

Proceeds from disposals are forecast to increase significantly in 2010/11, 2011/12 and 2012/13. This is primarily due to the proceeds from the sale of the former Dandenong Treatment Plant land exceeding remediation expenditure prescribed by the Commission.

Table 15.1: Annual Total Non Prescribed Services

	05/06 $M	06/07 $M	07/08 $M	08/09 $M	09/10 $M	10/11 $M	11/12 $M	12/13 $M
Revenue	22.27	22.42	27.06	39.60	39.06	40.31	40.43	39.31
Operating expenditure	23.43	30.71	35.77	39.23	39.14	40.13	39.49	38.65
Capital expenditure	0.82	0.66	0.65	0.63	2.72	2.11	1.50	1.42
Gifted Assets								
Proceeds from disposals	–	–	–	–	–	16.48	24.11	23.51

[118] $142.4 million is the Net Present Value of total non prescribed revenue over the regulatory period discounted using a Weighted Average Cost of Capital of 5.8%.

15.1.1 The Werribee Agriculture Group

Sheep and cattle grazing has been part of the landscape of the Western Treatment Plant since 1899. The farm is one of the largest grazing properties in Victoria, supporting around 15,000 cattle and 40,000 sheep and is run by the WAG.

Historically, grazing was carried out to manage the pasture produced by sewage irrigation. In 2004, Melbourne Water completed an upgrade of Western Treatment Plant which means all sewage is now treated in modern lagoons, replacing old ponds and traditional land and grass filtration. The upgrade means some 6,500 hectares of mainly ryegrass pasture are no longer needed for sewage treatment. Irrigation of these paddocks, which fatten cattle and sheep as a complementary business, has switched from sewage to recycled water, bringing new opportunities.

Irrigation with high quality recycled water opens up opportunities for a more sustainable mix of activities. While agriculture is not considered to be the core function of Melbourne Water, it has always complemented the aims of sewage treatment, conservation and land management at the site. As part of the *Western Treatment Plant Land Use Strategy*, Melbourne Water is investigating the potential for WAG's future operations to include a mix of crops, pastures, horticulture and forestry that will provide food, animal fodder, fibre, 'carbon sinks' and fuel and be the basis of future agriculture at the site.

15.1.2 Hydroelectric generation

Melbourne Water currently provides hydroelectric generation services through:

- A plant at the base of the Thomson dam owned and operated by Melbourne Water
- A build own operate transfer (BOOT) arrangement for a plant using inflows to the Cardinia Reservoir
- Preston, Notting Hill and Mountain View mini-hydros, which have been commissioned at various points in the water supply network.

Previously, the Thomson and Cardinia hydros, and the other mini-hydro projects (some of which are still to be constructed)[119], have been considered part of Melbourne Water's 'unregulated' business. The 2009 Water Plan proposes to treat the proposed Sugarloaf mini-hydro, and the six other mini-hydros, as part of 'regulated' business.

In 2008, Melbourne Water negotiated a new electricity agreement with AGL that enables the power generated by its mini-hydros to be transferred for use at other Melbourne Water sites for a small fee. This means that Melbourne Water is able to source its own hydro power at its various sites instead of purchasing grid power (which reflects the mix of mostly non-renewable generation supplying Victoria). This enables it to reduce its energy operating expenditures and allows more efficient operation of the water and sewerage systems (rather than the hydro power being sold into the grid and generating revenue).

[119] Three additional mini-hydro power stations will be commissioned at various points in the water supply network by 2009/10.

Reflecting the opportunity provided by this agreement for operational efficiencies, Melbourne Water proposes that the Sugarloaf mini-hydro and the six other mini-hydros should be treated as a part of Melbourne Water's 'regulated' business. This means that the capital and operating expenditures associated with these projects, along with the reduced energy operating expenditures they will derive for the business, will be included in Melbourne Water's proposed revenue requirement and price increases. Previously, the Thomson and Cardinia hydros as well as the six mini-hydro projects have been considered part of Melbourne Water's 'unregulated' business. Their expenditures did not form a part of Melbourne Water's revenue requirement and any revenues were recognised as being part of Melbourne Water's un-regulated business.

The proposed treatment of the Sugarloaf and other mini-hydros as part of Melbourne Water's 'regulated' business is consistent with other operational approaches used by Melbourne Water that enable it to generate energy and reduce its operating expenditures. The biogas from the treatment processes at the Western Treatment Plant, which are used to generate energy for on-site use, is one such example.

At this stage, given the contractual arrangements associated with the Thomson and Cardinia hydros, it is not proposed to treat these as part of 'regulated' business. However, as these contracts end (November 2009 and December 2013 respectively) opportunities to use their power in the same way as the mini-hydros will be explored, providing the potential for them to also be treated as a part of 'regulated' business.

In 2006/07 the drought limited operation of the two existing hydro plants and this necessitated the purchase of external renewable energy certificates to achieve Melbourne Water's renewable energy target. Generation was also limited during 2007/08. However, Melbourne Water did not purchase renewable energy certificates because the business had already exceeded the more critical greenhouse gas emission reduction target and was not required to achieve both targets.

15.1.3 Other

Of the remaining services where Melbourne Water is a monopoly supplier, prices are designed to recover the cost of service provision.

In situations where customers have the choice of alternative suppliers, competitive market rates apply.

Other non prescribed services include:

- Rental/lease of Melbourne Water properties
- Property development services (e.g. Dandenong Treatment Plant, Werribee Field developments)
- Information fees under the *Freedom of Information Act 1982*
- Storage of sludge for other authorities
- Recovery of pollution clean up costs.