



Environment

**and
Public Health
2001**

*Improving environmental
and public health performance
at Melbourne Water*



**Melbourne
Water®**

Contents	
Foreword	3
Melbourne Water's role in the urban water cycle	4
Environmental and public-health management	4
Environmental and public-health improvement plans	5
1. Drinking water quality guidelines	6
2. Microbiological quality of drinking water	7
3. Drinking water quality management systems	8
4. Managing flows in Melbourne's rivers	9
5. Stormwater quality management	10
6. Stream condition and health	11
7. Management of sewage biosolids	12
8. Reducing environmental impacts at Boags Rocks	13
9. Reducing environmental impacts on Port Phillip Bay	14
10. Sustainable water resource management	15
11. Odour management	16
12. Containing sewage spills	17
13. Land contamination	18
14. Energy use and greenhouse gas production	19
15. Community involvement	20

Melbourne Water is owned by the Victorian Government. We manage Melbourne's water resources. Three independent retail water companies provide local water and sewerage services to consumers.

Melburnians enjoy drinking water that we believe is among the world's best – thanks primarily to the foresight more than 100 years ago of Melbourne's city planners, who set aside water catchments protected from human contamination.

The city planners also laid the foundations for a sewerage system that continues to lead technology and environmental sustainability.

These are legacies few other cities in the world can match and Melbourne Water acknowledges that they provide a sound basis for the way we manage Melbourne's water resources both now and in the future.

In managing Melbourne's water supply catchments, sewerage system, waterways and drains, we strive to match the foresight and innovation shown by the city's original planners.

Our aim is to show leadership in water cycle management, through effective, sustainable and forward-looking management of the community resources we oversee.

The business objectives established to realise this aim are to:

- > Protect public health
- > Operate as a successful commercial business
- > Manage Melbourne's water resources and the environment in a sustainable manner
- > Provide excellent service and maintain the trust and respect of the community

At Melbourne Water we understand that partnerships with stakeholders and the community are the key to achieving our vision: leadership in water cycle management. We also appreciate that achievements occur through the contribution of our people.

At Melbourne Water we are people who:

- > Recognise that we achieve more by working with others
- > Feel privileged to be the custodians of our water resources
- > Behave with integrity
- > Attain excellence through creativity and innovation
- > Celebrate our achievements and learn from our experiences

Through working successfully with others and operating as an efficient commercial business, we will be able to make Melbourne a better place to live both now and in the future.

At Melbourne Water, we work to manage the city's water, sewage and stormwater so present and future generations can continue to enjoy one of the best environments of any major city in the world.

As the city has grown, so has the demand for water and we continue to generate increasing quantities of sewage and stormwater. This is placing greater pressures on our waterways, bays and ocean.

We believe our environmental, social and financial performance and results are of equal importance. We want to communicate openly with the community as we want people to understand our operations and actions. We seek community input to ensure we meet public expectations.

Environment & Public Health 2001 sets out our plans and priorities, and details programs to further improve the city's water management, including targets, timelines and measures of success. It will also enable the community to judge how well we meet their expectations.

We welcome feedback, comments and suggestions on this plan.



Brian Bayley
Managing Director

Melbourne Water's role in the water cycle

Melbourne's water cycle starts with the rain that feeds the city's reservoirs. It ends with the discharge of stormwater and treated effluent into Port Phillip Bay, Western Port and Bass Strait.

In addition to the water that is harnessed through the water supply and sewerage systems, there is the rain that falls on rural and urban catchments, and flows into creeks and rivers.

Melbourne Water manages all this water.

Our responsibilities start with protecting the forested catchments in the headwaters of the Yarra and Thomson rivers from human contamination. We manage the major reservoirs where water from the catchments is collected and stored.

We release some water from the reservoirs to maintain healthy environmental conditions in rivers and creeks downstream, but most of it is provided to the retail water companies, City West Water, South East Water and Yarra Valley Water. They provide water to households and businesses. Water is also provided to some other retail companies and Southern Rural Water.

The retail water companies collect sewage from households and businesses. Most of it is carried to Melbourne Water's Eastern Treatment Plant at Carrum and Western Treatment Plant at Werribee. After treatment, it is discharged under Environment Protection Authority (EPA) licences to Bass Strait and Port Phillip Bay respectively.

Much of the rain that falls in and around the city flows into pipes and drains leading into streams and creeks. Eventually, it reaches the Yarra, Maribyrnong and other rivers before flowing into Port Phillip Bay and Western Port. Some rainfall doesn't enter the pipes and drains and percolates into the soil as groundwater to recharge underground aquifers or to flow straight into creeks or rivers.

Melbourne Water works with local councils, the EPA, the land development industry, the Catchment and Land Protection Board and local communities to improve the quality of Melbourne's waterways. Councils collect stormwater from local catchments which flows into regional drainage systems managed by Melbourne Water.

Managing Melbourne's water resources sustainably is one of Melbourne Water's principal objectives and it achieves this by being a leader in water-cycle management.

Environmental and public health management

In a city the size of Melbourne, there are always risks associated with the provision of water, sewerage and stormwater management. Melbourne Water has a risk management policy to ensure risk is managed consistently throughout the organisation. The policy is based on risk focus areas, including the environment and public health. The policy is based on the Australian risk management standard.

Management systems have been developed for each of the risk focus areas.



These systems involve:

- > Identifying impacts and regulatory obligations
- > Establishing policies to guide what we do
- > Ensuring day-to-day management is satisfactory
- > Developing improvement plans where required
- > Reporting internally and externally so that information is available for decision-making
- > Involving the community in appropriate ways
- > Auditing and reviewing activities to make sure they are meeting stated objectives

Melbourne Water takes its environmental and public health responsibilities seriously. We actively manage them to make sure we comply with all relevant legislation. Where there are no statutory requirements, we adopt the most appropriate guideline. An example is the use of relevant parameters from the Australian Drinking Water Guidelines.

Melbourne Water has corporate policies for environment and public health. In some cases it has developed specific policies to manage particular issues. Examples are the “No Sewage Spills” and “Community Relations” policies.

Reporting on progress

Melbourne Water has a number of reporting processes to make sure it complies with statutory and other requirements. These include:

- > Monthly and quarterly reporting to our Board of Directors
- > Annual reporting to regulatory bodies
- > Annual reporting of performance to the general public through publications and community representative committees

Environment and Public Health 2001 is a new publication providing additional detail on environmental and public health performance and improvement plans.

Environmental and public health improvement plans

Melbourne Water has a comprehensive range of plans to improve its performance on important environmental and public health issues. These plans are discussed in the following pages.

The plans all have clear objectives related to Melbourne Water’s strategic directions. Each plan provides background information, a description of issues and a list of activities with timelines to address the issues. Managers responsible for each plan are identified by their title.

1. Drinking water quality guidelines

Background

Melbourne is one of the few cities in the world that is served by uninhabited catchments. It enjoys a consistently high standard of drinking water due largely to the quality of the catchments and natural purification in large storage reservoirs. Only minimal treatment and disinfection are normally required to provide high-quality water.

Some 90 per cent of Melbourne's water is harvested from uninhabited catchments and so does not normally require more than minimal treatment. The supplies from Yan Yean and Sugarloaf reservoirs, and the supply for Healesville and Yarra Glen receive full filtration. All supplies are disinfected to comply with health requirements. Chlorination is the preferred method of disinfection for microbiological quality control that ensures water is safe. The Melbourne water supply is fluoridated in accordance with statutory requirements.

Melbourne Water and the retail water companies servicing the greater metropolitan area have mostly operated under the Guidelines for Drinking Water Quality in Australia (1987).

Issues

In late 1996 the National Health and Medical Research Council of Australia and the Agricultural and Resource Management Council of Australia and New Zealand produced revised Australian Drinking Water Guidelines (ADWG 1996).

The Victorian Government has been reviewing these guidelines to determine how they should be adapted to provide drinking water standards for Melbourne given its special situation where the majority of its water comes from uninhabited catchments. The costs and commensurate health benefits are matters that are taken into account. New Victorian Drinking Water Quality regulations will be an outcome of the review.

The 1996 guidelines generally introduce tighter standards and the implications for Melbourne Water's system will vary depending on the specific standards adopted in the Victorian regulations.

Potential issues for Melbourne Water include:

- > Higher levels of chlorination may be required throughout the system to meet new total coliform guidelines
- > Water supplied to distant areas may require rechlorination to ensure effective disinfection. This could affect the taste and smell, and mean higher levels of disinfection by-products

Plan objective

- > To ensure Melbourne Water meets the appropriate drinking water standards and retains public confidence in the water supply system

Actions and time frame

To address the major issues, Melbourne Water is conducting a series of projects in conjunction with various research and health organisations. These include:

- > Completing a 12-month monitoring program and advising the Department of Human Services on implications of the new total coliform test method for performance monitoring
- > Participating in an international research consortium to look at the fate and transport of *Cryptosporidium* in water supply catchments with a final report due in June 2004
- > Participating in a Case Control Study on the link between gastro-intestinal illness, *Cryptosporidium* and drinking water with a final report due in September 2002
- > Contributing to the revision of national guidelines through representation on the NHMRC Coordinating Group for the Rolling Revision of Australian Drinking Water Guidelines
- > Participating in the regulatory impact process regarding the introduction by the Department of Human Services of new drinking water regulations based on the Australian Drinking Water Guidelines 1996

Measures of success

- > Compliance with drinking water quality regulations
- > High level of public confidence in Melbourne's water supply

Responsible person

- > Group Manager, Research and Technology

2. Microbiological quality of drinking water

Background

In Melbourne the microbiological safety of the water supply is achieved through a series of barriers to the entry and transmission of pathogens throughout the system. These are:

- > Uninhabited catchments for the harvesting of water
- > Long retention times in major catchment reservoirs
- > Additional retention time in seasonal storage systems
- > Conventional treatment or microfiltration of water that is not harvested from protected catchments (approximately 10 per cent of water requires full treatment)
- > Disinfection of the water before it enters the distribution system (chlorination is predominantly used)
- > Closed distribution systems to avoid any possible recontamination

As a result the greater metropolitan area enjoys a consistently high standard of drinking water.

Issues

Melbourne Water strives for continuous improvement in the condition and management of its water supply system. Issues that have been targeted for improvement include:

- > Enhancing the reliability of disinfection plants
- > Reducing the potential for algae growth in, and airborne contamination of, open reservoirs
- > Managing the transfer of water in open conduits

Plan objective

- > Compliance with statutory requirements, drinking water guidelines, supply agreements with the retail water companies and corporate performance targets for treatment plants

Actions and time frame

A range of projects is under way to enhance the reliability of the microbiological quality of drinking water supplied. They include:

- > Lining and covering of reservoirs at Garfield (August 2001) and Dromana (December 2003)
- > Replacement of open reservoirs at Johns Hill, Emerald (December 2001), Frankston (December 2002) and Mornington (December 2002) with closed tanks
- > Investigations within the water supply system to improve understanding of the need for secondary disinfection and the impact of this on water quality and aesthetics
- > Monitoring of water harvesting procedures for Yarra tributaries during and after storms over a complete seasonal range to improve procedures by December 2002
- > Implementation of a "Reliability Centred Maintenance" program at critical disinfection plants over a five-year period with the aim of improving plant reliability

Measures of success

- > Compliance with statutory requirements, drinking water guidelines, and bulk supply agreements with the retail water companies
- > Achievement, on schedule, of activities within the program to enhance water quality and supply

Responsible persons

- > Group Manager, Asset Management and Capital Delivery (improvement works)
- > Group Manager, Planning (improvement planning)

3. Drinking water quality management systems

Background

Our water quality management systems are designed to minimise the risk to human health from pathogens in the water supply system and ensure continuity of supply of good quality water. These systems are based on barriers to the entry and transmission of pathogens throughout the system (see page seven, Microbiological Quality of Drinking Water improvement plan, for a full description of the barriers).

End-point sampling of indicator organisms such as total coliforms and faecal coliforms is used to assess the effectiveness of these barriers. Monitoring for specific pathogens is carried out on a routine basis and for specific investigations. Melbourne Water also has a series of management systems aimed at maintaining a consistently high standard of drinking water. These include a Public Health Policy, a Quality Management System for the treatment and supply of drinking water certified to ISO9001, a Hazard Analysis Critical Control Point method, standard operating procedures and protocols and contingency plans for dealing with incidents.

Issues

The minimisation of risk cannot be achieved by end-point monitoring alone. Other procedures are needed to adequately protect against pathogens such as the protozoans *Cryptosporidium* and *Giardia*.

Plan objective

- > To ensure Melbourne Water meets the appropriate water quality guidelines and retains public confidence in the water supply system

Actions and time frame

Melbourne Water will continue to assess and manage water quality risks in its water supply system, from the catchments to the contract interface points with the retail water companies. This involves:

- > Confirming where Melbourne Water has best practice in place and identifying areas of potential improvement to Melbourne Water's drinking water quality assurance system
- > Implement improvement actions in the ISO 9001 Quality Management System for the treatment and supply of drinking water and maintaining the Hazard Analysis Critical Control Point method

Measures of success

- > Adoption and implementation of recommendations from the risk assessment in accordance with program schedules
- > Implementation of improvement actions and maintenance of certification of the Quality Management System for the treatment and supply of drinking water
- > High level of public confidence in the water supply system maintained

Responsible person

- > Group Manager, Service Delivery

4. Managing flows in Melbourne's rivers

Background

Melbourne Water plays a major role in the management of river flows. It is responsible for:

- > Intercepting flows in rivers and storing water in reservoirs for the city's use
- > Ensuring the rivers receive enough water in "passing flows" to maintain environmental conditions below interception points
- > Managing the pumping of water from unregulated rivers for domestic and stock purposes, process cooling and agricultural and horticultural purposes
- > Modelling the impacts of floods and protecting floodplains
- > Providing information on potential flooding of the major waterways to the Bureau of Meteorology

Managing these responsibilities in an integrated manner produces the best results.

Melbourne Water is one of the parties consulted when Government establishes the bulk entitlements for regulated streams (those with dams/weirs) and is developing streamflow management plans for unregulated streams.

Issues

Issues in managing stream flows include:

- > The definition of entitlements by Government to water from Melbourne Water's catchments including environmental flow requirements
- > Maintaining Melbourne's water supply requirements and the irrigation needs of private "diverters" in the Yarra and lower Maribyrnong catchments
- > Security of supply during times of drought
- > Seasonal variations in flows needed for environmental requirements
- > Determining the importance of adequate stream flows to a stream's health
- > Potential impacts from flooding
- > Being able to measure the ecological benefits of environmental flows

Plan objective

- > To ensure that an appropriate balance is achieved between the value of water supply to the community and the need for adequate flows to maintain stream ecology.

Actions and time frame

- > Conduct consultation as part of finalising Streamflow Management Plans for the following streams:
 - Hoddles Creek (during July 2001)
 - Diamond Creek (during October 2001)
 - Plenty River (during December 2001)
- > Start the process for producing Streamflow Management Plans for the following streams:
 - Woori Yallock Creek (by October 2001)
 - Olinda Creek (by December 2001)
- > Monitoring flows below regulating structures and managing water supply abstraction to ensure passing flows are met
- > Annually review Melbourne Water's private diverter drought response plans
- > Monitoring the flow in major streams to provide a flood warning system
- > Contributing to establishing bulk water entitlements for the Yarra and Tarago catchments
- > Implementing actions related to Melbourne Water's Bulk Entitlement to water from the Thomson River

Measures of success

- > Meeting all minimum streamflow requirements at designated locations
- > Completion of Yarra catchment streamflow management plans (as agreed with NRE) by June 2003
- > Compliance of diverters with drought response plans
- > Yarra and Tarago bulk water entitlements issued to Melbourne Water by the Minister
- > Provision of information on potential flooding to the Bureau of Meteorology to enable effective public warnings about major flood events

Responsible persons

- > Group Manager, Service Delivery (releases below reservoirs and flood warning)
- > Group Manager, Planning (stream flow management plans)

5. Stormwater quality management

Background

Melbourne Water is responsible for managing waterways in the greater Melbourne area. A major component of stream health is the quality of water – its physical, chemical and biological conditions. Over the years community interest in the condition of Melbourne's streams has steadily increased. The EPA has established long-term objectives for water quality. A total catchment approach is required to move closer to meeting these objectives.

Melbourne Water monitors stream water quality and regularly publishes the results.

More recently we have sought to influence people and organisations whose activities affect water quality. They include the development industry, local government and individual community members.

Melbourne Water has established the Healthy Bay Initiative that includes the construction of wetlands aimed at improving stormwater quality. Wetlands improve water quality by slowing stormwater down allowing sediments to settle out, through the action of biological films on vegetation which process nutrients and organic matter, and through the sterilising action of sunlight.

Issues

The issues addressed by this improvement plan include:

- > The diffuse nature of stormwater pollution with inputs from the catchment by many different activities and individuals
- > The large number of people who can have an impact on stormwater quality
- > The need to reinforce community awareness that litter and other pollutants going down drains will be carried through stormwater pipes into high-value waterways and the bays
- > The significant impact of road runoff and motor vehicles emissions on stormwater quality
- > The incomplete understanding of water quality pollutant sources and the means of pollutant transmission
- > The likely growth in pollutant loads due to urban growth

Plan objective

- > To work with others to protect and maintain the quality of stormwater so that, in the long term, State Environment Protection Policy objectives in receiving waters are met and, in the medium term, to at least maintain existing water quality despite urban growth

Actions and time frame

- > Working with the land development industry to protect stormwater quality from new urban developments
- > Retro-fitting water quality treatment systems in existing urban areas
- > Working with local councils in the development of six more Stormwater Management Plans by June 2002 and achieving complete coverage by June 2003
- > Promoting the Best Practice Environmental Management Guidelines for Urban Stormwater Management to the development industry and local government
- > Completing the Healthy Bay Wetland project in the south-east growth corridor by June 2003
- > Developing a Nitrogen Reduction Strategy detailing reductions in nitrogen transported to Port Phillip Bay by stormwater by July 2002
- > Fostering the development of water sensitive urban design in new areas
- > Using water quality data to direct resources towards streams where improvement is most needed
- > Review the Waterways and Drainage Operating Charter taking into account community issues by June 2003
- > Improving understanding of impacts on stormwater quality from urbanisation in the Yarra catchment through research undertaken by the Cooperative Research Centres for Freshwater Ecology and Catchment Hydrology

Measures of success

- > Waterways and Drainage Operating Charter reviewed
- > All councils in the greater Melbourne area have completed Stormwater Management Plans by June 2003

Responsible persons

- > Group Manager, Asset Management & Capital Delivery (wetlands and nitrogen reduction)
- > Group Manager, Planning (development industry)
- > Group Manager, Research & Technology (CRC research)

6. Stream condition and health

Background

Melbourne Water's responsibility for stream management includes protecting existing vegetation and good quality habitats, rehabilitating areas that are degraded as well as protecting private and public assets from damage or loss due to bed or bank failure.

Environmental flow requirements are met through bulk entitlement agreements and streamflow management plans. The quality of water in streams, and the stability and quality of the beds and banks are managed through a range of programs. Improving stream ecology is also often achieved by working in partnership with adjoining landholders, councils and community conservation groups.

Issues

As urban and agricultural development in and around Melbourne has occurred, streams and the plants and animals that depend upon their ecology have suffered. Stream management used to be based on managing flows to prevent flooding. Over the years this has changed to a more integrated approach that recognises the importance to the community of a stream's ecological and landscape values. Many people believe that waterways contribute significantly to the living environment in Melbourne. Since 1998 the Index of Stream Condition has been used to describe the condition of Melbourne's streams.

Plan objective

- > To continuously improve the environmental health and physical condition of urban and rural waterways in the greater Melbourne area

Actions and time frame

Actions include:

- > Providing assistance to landowners through the stream frontage management program
- > Provision of "fish ladders" and "fishways" on a priority basis in significant waterways, so fish can pass instream obstructions
- > Biological and toxicant monitoring programs to indicate stream health and areas for improvement
- > Supporting research into platypus in urban waterways
- > Applying the Index of Stream Condition to all streams on a five-year rolling basis to assist with the prioritisation of stream management works
- > Achieving full coverage with Waterway Management Plans by the end of 2002 and revising these on a five-year rolling basis
- > Undertaking waterway rehabilitation and stabilisation projects

Measures of success

- > Continued existence of healthy platypus populations in waterways
- > Existence of migratory species of fish above stream fishways
- > Planting of 50,000 plants and building of 25 kilometres of fencing each year under the Stream Frontage Protection program
- > Assessment of all waterways using the Victorian Index of Stream Condition every five years

Responsible persons

- > Group Manager, Asset Management & Capital Delivery (frontage management, fishways, stream condition)
- > Group Manager, Research & Technology (platypus research)

7. Management of sewage biosolids

Background

Melbourne Water's sewage treatment plants produce more than 40,000 tonnes of dry biosolids equivalent each year. At the Eastern Treatment Plant, approximately 25 per cent of the biosolids are sold as soil conditioner. The rest is stored on site. At the Western Treatment Plant, all biosolids are retained on site.

The management of biosolids is becoming increasingly complex due to changing factors, including:

- > Regulatory requirements to maximise the reuse of biosolids
- > An evolving regulatory environment governing the reuse of biosolids
- > Treatment plant process changes
- > The requirement to achieve improved odour performance from the Western Treatment Plant, including at the biosolids handling areas
- > Limitations on biosolids storage facilities and the requirement for periodic rehabilitation of the sludge drying pans at the Eastern Treatment Plant
- > Changes to desludging, dewatering, storage, reuse, and disposal practices and their impact on a long-term strategy for overall biosolids management

Issues

There is a range of issues relating to the management of biosolids. They include:

- > Technical matters relating to the dewatering and treatment of sludge and the drying of biosolids
- > The effect of trade waste and domestic sewage on the quality characteristics of the final biosolids products
- > Acceptance of sludge or biosolids from other waste treaters
- > Regulations and guidelines for the reuse of biosolids
- > Product liability and potential land contamination associated with biosolids reuse
- > Community and stakeholder acceptance of biosolids reuse
- > Technology changes for the handling and treatment of biosolids
- > The cost of treatment, disposal and reuse of biosolids

Plan objective

- > Compliance with EPA licence conditions and relevant policies and statutory obligations

Actions and time frame

- > Implement recommendations in the strategic position paper on biosolids management with the long-term aim of re-using all biosolids produced at Eastern and Western Treatment plants
- > Construct the first stage of new sludge drying and storage facilities at Western Treatment Plant by December 2003
- > Reuse sludge from Eastern Treatment Plant as landfill for Woodlands wetlands by December 2003
- > Monitor technology changes regarding biosolids management
- > Work with the retail water companies to manage sewage quality and any potential risks of regulatory non-compliance or limitations on the cost-effective disposal of sewage biosolids, including by maintaining and progressively improving agreed sewage quality management systems

Measures of success

- > 100 per cent compliance with regulatory requirements for the management and reuse of biosolids
- > Increasing levels of annual biosolids reuse to achieve 50 per cent reuse at Western Treatment Plant and 100 per cent reuse at Eastern Treatment Plant by 2020.

Responsible persons

- > Group Manager, Asset Management & Capital Delivery (sludge management facilities)
- > Group Manager Service Delivery (biosolids reuse)
- > Group Manager, Planning (trade waste management)
- > Group Manager, Commercial Services (Braeside project)

8. Reducing environmental impacts at Boags Rocks

Background

The Eastern Treatment Plant at Carrum receives approximately 40 per cent of the sewage generated in metropolitan Melbourne. Most of the treated effluent is discharged to Bass Strait at Boags Rocks near Cape Schanck on the Mornington Peninsula. The shoreline discharge is next to the Gunnamatta surf beach. Approximately one per cent of the effluent is used for agricultural purposes or irrigation of public areas and golf courses in accordance with EPA Victoria guidelines. The Eastern Treatment Plant operates under a licence issued by the EPA. Compliance with licence standards aims to be 100 per cent. The licence required Melbourne Water to carry out an investigation and consultation program to evaluate treatment, reuse and outfall extension options to improve environmental performance of the plant.

In mid-1997, Melbourne Water commissioned the CSIRO to undertake an effluent management study on the impact of the discharge at Boags Rocks and the opportunities for reduced discharge and greater use of recycled water. Other research tasks were undertaken at the same time. In summary the study included:

- > Environmental impact assessment of the discharge on the marine environment
- > Review of land and marine effluent disposal options
- > Microbiological health risk assessment
- > Investigating treatment improvement options at the plant itself
- > Investigating outfall extension concepts and options
- > A community consultation program

In the meantime, a program to enhance treatment plant processes and functions has been implemented to improve operational and environmental performance, and reduce operating costs.

Issues

The four broad issues related to the outfall at Boags Rocks are:

- > The nature and magnitude of the impact of the discharge on the local marine ecology
- > The possible health effects of the outfall on surfers and swimmers
- > Changing public expectations regarding discharge standards
- > Minimisation of the ocean discharge and its potential impact on the environment (for example, by the maximum use of recycled water)

Plan objective

- > Compliance with EPA licence conditions and relevant policies and statutory obligations

Actions and time frame

The following actions to improve performance at Eastern Treatment Plant will be implemented:

- > Facilitating funding discussions between stakeholders for the proposed Eastern Irrigation Scheme to supply the Koo wee rup horticultural area by June 2002
- > Conducting research and a major field trial into improved aeration efficiency and nitrogen removal performance by December 2001
- > Completing a major upgrade of the outfall pumping station and sludge gas utilisation system by February 2003
- > Completing an upgrade of primary treatment by December 2001
- > Establishing a research program into aesthetic impacts (foam, oil and grease, litter, odour and colour) at Boags Rocks due to the Eastern Treatment Plant discharge with a final report by March 2002
- > In consultation with stakeholders, the EPA and the broader community, establish an agreed improvement plan that reduces the environmental impact at Boags Rocks and contributes to a sustainable Mornington Peninsula by November 2001

Measures of success

- > Development of a cost-effective strategy to address the effluent management study outcomes within the time frame specified by the EPA
- > Delivery of the expected benefits from each of the process improvement projects, including overall annual cost savings by mid-2003 and reduced environmental impacts at Boags Rocks
- > 100 per cent compliance with EPA licence and other statutory requirements

Responsible persons

- > Group Manager, Asset Management & Capital Delivery (ETP upgrades)
- > Group Manager, Planning (EPA works approval)
- > Group Manager, Research & Technology (aesthetic impacts and aeration research)
- > Group Manager, Commercial Services (Koo wee rup initiative)

9. Reducing environmental impacts on Port Phillip Bay

Background

Treated effluent from the Western Treatment Plant discharges to the western side of Port Phillip Bay at four points between the Werribee River and Point Wilson. Streams and stormwater drains collect agricultural and urban stormwater run-off from the Yarra, Maribyrnong, Werribee, Moorabool and part of the Bunyip river basins. These impose sediment, nutrient and other pollutant loads on the bay, which need to be matched with its assimilative capacity to accept them. At the same time, natural flows have been modified by water harvesting, and agricultural and urban development.

In 1992 the CSIRO was commissioned to conduct a major environmental study of the bay. The study was the most comprehensive and integrated environmental audit undertaken on a coastal ecosystem in Australia. The aim of the study was to assess the health of the bay, given the sediment, nutrient and other toxicant loads imposed on the bay. Particular objectives included identifying the factors having an environmental impact on it and determining how best to manage the bay in the long term. Sixteen main recommendations resulted from the study. These dealt principally with toxicants, nutrients and the ecology of the bay.

Issues

The major issues for Melbourne Water identified in the Port Phillip Bay Environmental Study are:

- > A long term target for reducing the annual average load of nitrogen to the bay by 1000 tonnes
- > A reduction in the impact of nitrogen and sediment from storm loads and urban run-off
- > Improvement in the nitrogen removal processes at the Western Treatment Plant, especially during winter
- > Protection of the aesthetic and conservation values of the coastal and intertidal zones
- > Reduction in toxicant inputs to waterways and drains leading to the bay
- > Development of catchment models that can be integrated with models of the bay and of the entire water cycle

Plan objective

- > Compliance with EPA licence conditions and relevant policies and statutory obligations

Actions and time frame

Major works are being undertaken to reduce environmental impacts of the Western Treatment Plant by enhancing treatment processes to cut nitrogen loads and to improve effluent quality, particularly with respect to ammonia, BOD (a measure of the oxygen depleting potential of a waste stream) and suspended solids.

These will ensure that new EPA licence obligations to take effect in 2001 and 2005 are met.

The works/actions are:

- > Use information on performance and cost-effectiveness of the initial enhanced lagoon system to retro-fit enhanced lagoon technology to another major lagoon system by June 2004
- > Identification, and the construction, of any further works required to meet EPA licence conditions which come into effect in 2005
- > Upgrading the pre-1980s lagoon systems by December 2005

Other activities to reduce the impact of stormwater run off on the bay are included in the Stormwater Quality Improvement Plan (see page 10).

Measures of success

- > Achievement of construction and upgrade programs and activities on schedule
- > 100 per cent compliance with EPA licence and other statutory requirements
- > Reduction of an aggregate 500 tonne per annum nitrogen load to Port Phillip Bay by 2006 compared with a specified EPA baseline including achievement of an average 3500 tonne per annum target by December 2001

Responsible persons

- > Group Manager, Asset Management & Capital Delivery (lagoon enhancement construction)
- > Group Manager, Planning (additional lagoon enhancements)

10. Sustainable water resource management

Background

As Melbourne continues to grow, the community has become more concerned about limits to water resources. Melbourne Water recognises the need to maximise the use of recycled water to meet new or existing water demands and to defer the potential need for major new water storages.

The current drought has emphasised the importance of ensuring Melbourne's water supply can cope with varying climatic conditions. The value of water can only increase over time and establishing sustainable resource management will help avoid the need for a new dam.

Melbourne Water wants to reduce the volume of effluent it discharges to the marine environment. At present, about one per cent of the effluent from the Eastern Treatment Plant is recycled by agriculture and sporting facilities close to the plant or the outfall pipeline.

Issues

The recycling of water has environmental and public health implications although the community generally accepts appropriate recycling. Issues that need to be managed include:

- > The level of treatment and consistency of effluent quality from the sewage treatment plants
- > The types of reuse proposed and the management required to address environmental and public health concerns
- > Financial arrangements to provide the infrastructure needed to recycle more water
- > The discharge of treated effluent that cannot be recycled because there is not enough demand for it
- > The availability and the cost of existing water supplies

Other issues include the community's concern over the potential future need for additional water storage dams in sensitive environments.

Plan objective

- > To achieve sustainable water resource management

Actions/time frame

- > Developing a Water Resources Strategy to ensure adequate security of water supply to the community and satisfactory environmental flows to rivers by June 2002
- > Adopting a whole of Government and industry approach in the development of innovative recycled water schemes
- > Completing the effluent recycle and distribution system at the Western Treatment Plant by December 2004
- > Ensuring sewage quality from business and domestic sources does not unreasonably compromise Melbourne Water's capacity to recycle water

Other actions to increase water recycling at Eastern Treatment Plant are in the Reducing Environmental Impacts at Boags Rocks Improvement Plan (see page 13).

Measures of success

- > Completion of the Water Resources Strategy
- > Achieving an annual average water recycling target of 20 per cent by 2010

Responsible persons

- > Group Manager, Asset Management & Capital Delivery (water recycling system)
- > Group Manager, Planning (water resources strategy)
- > Group Manager, Commercial Services (whole of Government approach to recycled water)

11. Odour management

Background

Odour can be generated in transporting sewage in pipes, treating sewage, digesting and drying sludges and in the use of chlorine. Decomposing algal growth in lagoons and waterways can also produce odours. Melbourne Water's EPA discharge licences require us to confine odours from sewage treatment plants within the plant boundaries. We aim to reduce the incidence of offensive odours and act to stop those that do occur as quickly as possible.

Issues

The generation and management of odours is a critical issue for Melbourne Water. While it is not always possible to stop the generation of odours, it is important to minimise the impact of odours on the general public, including neighbours and people passing by Melbourne Water assets. Issues related to odours include:

- > Adequately characterising odours and understanding how they are generated
- > Being able to determine sources of odours
- > Responding promptly to odour complaints from the general public
- > Emerging technologies to identify and manage odour
- > Taking a long-term view, especially for Melbourne Water's neighbours and on adjacent development proposals

Plan objective

- > To contain any persistent objectionable odours within the boundaries of Melbourne Water's property

Actions and time frame

Melbourne Water will:

- > Establish an odour management framework and policy to manage odour at treatment plants and in the sewerage system by December 2001
- > Investigate options to improve processes at Eastern Treatment Plant that could reduce the incidence of odours at the outfall by December 2001
- > Providing odour reduction works as part of the Western Treatment Plant Environment Improvement Project including covering of anaerobic sections of lagoons, stopping the direct application of raw sewage to land and closing the West Sedimentation Tanks, progressively by 2005
- > Work with the EPA to develop a management program for any residual odour issues at Western Treatment Plant beyond January 2005

Measures of success

- > Implementing actions as a result of establishing the odour management framework
- > No complaints of persistent offensive odours and a falling number of intermittent odours attributable to any particular Melbourne Water source
- > Acceptance based upon a community survey that the works associated with the Western Treatment Plant Environment Improvement Project have reduced odours

Responsible persons

- > Group Manager, Planning (odour plans)
- > Group Manager, Service Delivery (odour management programs)

12. Containing sewage spills

Background

Sewerage systems are designed to transport sewage flows based on catchment size. Flows coming from illegal stormwater connections and inflows from groundwater infiltration can lead to a sewer's capacity being exceeded. Sewers are not designed to carry 100 per cent of all flows. If they were, the pipes would be extremely large and uneconomic. Overflow points are located at strategic points in the system to minimise the effect of spills to the environment and risks to public health. These also allow overflows from sewer blockages to be relieved at the most appropriate point.

As Melbourne has grown, some of the sewers built over the past 100 years have been replaced or augmented to cope with an increasing volume of sewage. At the same time the community's concern with raw sewage spilling to the environment has risen.

Melbourne Water has responded to these concerns by implementing the No Sewage Spills Policy.

The EPA's policy requires sewerage systems to progressively have the capacity to convey without spilling all sewage generated in a catchment up to and including a one-in-five-year rainfall event.

Issues

Melbourne's sewerage system has pipes that are up to 100 years old. Issues that need to be addressed to meet the plan's objective for sewage containment include:

- > Appropriate monitoring of the condition of existing sewers
- > Maintaining an awareness of population growth to enable management of changing flow patterns
- > Recording weather conditions to identify one-in-five-year rainfall events and monitoring flows in the sewerage system at critical points
- > Modelling the sewerage system to prioritise works to augment the sewerage system's capacity
- > Operation of the sewerage system to optimise acceptance of flows and reduce overflows

Plan objective

- > To progressively augment the sewerage system to contain all sewage resulting from a one-in-five-year rainfall event under average catchment conditions and to prevent sewage spills to the environment due to operational or asset failure

Actions and time frame

Actions under this plan include:

- > Monitoring and assessing the condition of all sewers to ensure any necessary rehabilitation works are undertaken in a timely manner and their structural integrity is maintained
- > Managing flows in the sewerage system to avoid sewage spills due to operational failures and during dry weather
- > Maintenance and continual enhancement of a hydraulic model to effectively assess hydraulic performance of the sewerage system
- > Operation and maintenance of flow monitoring equipment to manage flows and to plan for timely and adequate augmentation of system capacity to meet service standards
- > Working with the retail water companies to develop joint improvement projects for locations that do not meet the EPA one-in-five year spill test
- > Construct the Melbourne Water stage of the Merri Creek Diversion Sewer as part of implementing the Northern Sewerage Strategy with Yarra Valley Water by 2009
- > Regularly removing sediments from sewers to maintain capacity

Measures of success

- > Zero spills due to operational failures which have the potential to cause an environmental impact
- > Progressive reduction in spills for all rainfall events below one-in-five-year frequency under average catchment conditions

Responsible person

- > Group Manager, Planning (modelling and spill reduction)
- > Group Manager, Service Delivery (system management)
- > Group Manager, Asset Management & Capital Delivery (system improvements)

13. Land contamination

Background

Melbourne Water sells surplus land and purchases land needed for new projects. Soil contamination is an issue that needs to be investigated and understood before property transactions are finalised. On selling land, we need to know if the soil is contaminated and should be decontaminated before sale and when buying land we need to know if land is contaminated before we buy it. We have to avoid contaminating land so that its value is not reduced and the environment is not damaged. Activities that can lead to contamination include sewage treatment, sludge storage, pipe scouring, sediment removal from streams and sediment traps and disposal of contaminated soils from construction sites.

Issues

The critical issues related to land contamination include:

- > The status of contamination in land being sold or bought
- > Recognising the current market value of land held and being used for Melbourne Water activities
- > Emerging land contamination criteria in government policies and guidelines
- > Liabilities that Melbourne Water has through the ownership and use of land

Plan objective

- > To ensure that surplus land sold by Melbourne Water reflects its market value
- > To minimise the liability to Melbourne Water from the disposal and acquisition of land

Actions and time frame

Melbourne Water aims to:

- > Develop a policy to minimise contamination of land from current activities by December 2001
- > Assess the contamination status of all land that Melbourne Water buys or sells
- > Assess and manage any known contaminated land owned or managed by Melbourne Water in accordance with relevant statutory and corporate requirements
- > Manage the contaminated land at the former Dandenong Treatment Plant according to the EPA Pollution Abatement Notice and implement a remediation program at the plant by June 2003
- > Implement the Western Treatment Plant land management strategy to maximise the use of land not needed for sewage treatment by December 2003
- > Phase out the discharge of untreated sewage to land at Western Treatment Plant by December 2005

Measures of success

- > Land Contamination Policy completed by December 2001
- > Provide an annual report to the EPA for the former Dandenong Treatment Plant
- > Cease the application of raw sewage to land for treatment at Western Treatment Plant by 2005
- > Meeting relevant statutory and corporate requirements

Responsible persons

- > Group Manager, Commercial Services (policy, land transactions and Dandenong Treatment Plant)
- > Group Manager, Planning (Western Treatment Plant land application phase out)

14. Energy use and greenhouse gas production

Background

Melbourne Water uses a significant amount of energy. It is used to operate electric pumps, treat water and sewage, run offices and transport people. Energy accounted for approximately eight per cent of Melbourne Water's 1998–99 budget expenditure. A coordinating Energy Management Team has been established to explore how we can reduce the amount and cost of energy we use and emissions of greenhouse gases to the environment. Melbourne Water has established a Greenhouse Strategy to reduce its emissions.

Australia has tentatively agreed to limit the increase of greenhouse gas emissions to no more than 1.08 times 1990 levels. Contributions towards achieving this target may be used in developing greenhouse gas trading markets.

Issues

A supply of reliable energy is critical to Melbourne Water. There is the potential for Melbourne Water to generate energy through hydro-electricity plant and from the collection and combustion of gases produced during sewage treatment processes.

Critical issues include:

- > Balancing the use of energy with the need to meet Melbourne Water's service objectives
- > The relative costs and payback periods for energy recovery facilities
- > Government targets for greenhouse gas emission reductions
- > Retail electricity suppliers desire for sources of renewable energy

Plan objective

- > To reduce the cost and the environmental impact due to Melbourne Water's use of energy

Actions and time frame

Melbourne Water plans to:

- > Implement the Melbourne Water Greenhouse Strategy
- > Join the Greenhouse Challenge by December 2001
- > Develop energy performance indicators and targets that are based on the unit cost of providing Melbourne Water services by December 2001

Measures of success

- > Measurement and reporting as required by participation in the Commonwealth Government's Greenhouse Challenge
- > Development of targets for reducing energy and greenhouse gas emissions by December 2001
- > Reduction in the cost per unit of Melbourne Water services

Responsible persons

- > Group Manager, Service Delivery (energy management)
- > Group Manager, Research & Technology (greenhouse strategy)

15. Community involvement

Background

Melbourne Water has a strong commitment to communicating openly with its community stakeholders. We provide a great deal of information to the community to help people understand our operations and actions, and to ensure there are many opportunities for community input to our decision-making.

People need accurate information on the costs and benefits of proposed environmental and public health improvements. Melbourne Water communicates with community stakeholders on many levels and in many ways. In addition to a comprehensive communications program through the mainstream media, we work closely with community organisations and individuals about specific projects. This ensures that we find out how the community feels about the services we provide, and we have the opportunity to address community concerns early on, before major problems arise.

Issues

It is important for Melbourne Water to be sure that it is meeting community needs. That is why we maintain appropriate community relations at both broad and specific levels.

Initiatives include:

- > Providing information on Melbourne Water's activities
- > Reporting of Melbourne Water's performance
- > Involvement in new project development
- > Assistance to help community groups become involved in Melbourne Water's activities
- > Ongoing assessment of community concerns

Plan objective

- > To be an excellent corporate citizen through improved accountability, increased transparency and enhanced interaction with the community

Actions and time frame

- > Introduce Triple Bottom Line reporting to Melbourne Water's annual reports for the 2000–2001 year
- > Appropriately involve affected community groups and individuals in the development of Melbourne Water's projects and strategies
- > Prepare information on Melbourne Water's programs for all community groups including people with non-English-speaking backgrounds
- > Introducing youth forums with the assistance of the Australian Conservation Foundation by January 2002 to obtain advice on how best to relate to young people in educational campaigns
- > Working with community and key stakeholders to develop key performance indicators for Melbourne Water's social responsibility by December 2001
- > Undertaking a community consultation program on the Environmental Improvement Plan for the Eastern Treatment Plant
- > Conducting an independent evaluation of Melbourne Water's community consultation programs by June 2002

Measures of success

- > Positive comment from an independent evaluation of Melbourne Water's community consultation programs

Responsible person

- > Group Manager, Communications