



**Melbourne
Water**

Public Health Compliance

Quarterly Report

Quarter One 2006/07
(July, August, September 2006)

DRINKING WATER

Issues/Initiatives/Incidents.

Hardness of Drinking Water

The World Health Organization (WHO) recently released the final version of a report on *Nutrients in Drinking Water* as part of the rolling revision process for development of the WHO Guidelines for Drinking-Water Quality. The report details the role of drinking water as a source of dietary nutrients and its consequent impacts on human health. It examines the relationship between water hardness and cardiovascular disease mortality.

Epidemiological studies on this topic date from 1957. However, prior reviews by WHO accepted that the evidence was insufficient to conclude that a causal relationship existed and therefore no recommendations could be made about minimum hardness levels in drinking water. However, the participants at the 2003 meeting concluded that: "On balance, the hypothesis that consumption of hard water is associated with a somewhat lowered risk of cardiovascular disease was probably valid, and that magnesium was the more likely contributor of those benefits".

This statement has significant implications for drinking water suppliers as it may lead to the establishment of minimum health-based guideline values for calcium and/or magnesium in future editions of the WHO Guidelines. Possible minimum guideline values proposed in the report are 20mg/L to 30mg/L for calcium and 10mg/L for magnesium. Adoption of these values would require modification of many drinking water supplies, which have lower levels and would also affect the bottled water, domestic water treatment and desalination industries.

Hard water requires more soap than soft water to obtain a lather and it may cause scale to form on hot water pipes and fittings. Total hardness is measured as the sum of the concentrations of calcium and magnesium ions expressed as calcium carbonate (CaCO₃). The Australian Drinking Water Guidelines 2004 suggest an upper limit of 200mg/L for total hardness to minimise the build up of scale in hot water systems. There are no health limits prescribed for hardness, calcium or magnesium.

The concentrations of calcium and magnesium in Melbourne's water supply are normally in the order of 3mg/L to 6mg/L and 1mg/L to 2mg/L respectively. Total hardness is in the order of 10mg/L to 26mg/L CaCO₃. The higher values occur with the Winneke and Yan Yean supplies. The Australian guidelines categorise waters with hardness below 60mg/L CaCO₃ as 'soft but possibly corrosive'.

This is an emerging medium to long-term issue and Melbourne Water is maintaining a watching brief on the matter through the Cooperative Research Centre for Water Quality and Treatment and the Water Services Association of Australia.

Water Quality Customer Complaints Originating from Melbourne Water Operations

Following the commissioning of the Morang Reservoir Outlet Main on 26 July 2006, Yarra Valley Water received fifty taste and odour complaints from reticulation areas receiving water from this main. It is believed the complaints arose from receiving a quantity of aged water from the Morang Outlet Main. The water was affected due to having a prolonged contact with the main, which was lined with coal tar enamel. Although the main was flushed, an unexpected delay in the completion of the project meant that the water had again become affected by prolonged contact.

The Standard Operating Procedure for flushing and reintroduction of out of service water mains has been amended to ensure the mains are fully flushed and checked prior to being returned to service.

Catchment and Water Supply Asset Security

During the quarter 41 minor security breaches were recorded. These predominately involved the cutting of fences, trespassing, vandalism, fishing and littering in the catchments. The security breaches had no discernible impact on water quality.

Regulations and Compliance Targets

This section summarises the statutory requirements and corporate targets related to the quality of water supplied by Melbourne Water. Details of compliance and indicators of microbial performance are shown in the following sections.

The *Health (Fluoridation) Act 1973* requires the provision of fluoride in drinking water at concentrations not in excess of 1 mg/L. The requirements of the Act are further amplified by the accompanying Standards for Fluoridation of Public Water Supplies. In the Standards the Department of Human Services (DHS) adopted the recommendations contained in the NHMRC/AWRC 1987 Guidelines for Drinking Water Quality in Australia (referred to as NHMRC/AWRC 1987 Guidelines).

The *Health (Quality of Drinking Water) Regulations 2002*, made under the *Health Act 1958*, have been repealed by Part 6 of the new *Safe Drinking Water Act 2003* and have been replaced by the *Safe Drinking Water Regulations 2005*. The drinking water quality standards set under the Regulations apply at prescribed sampling points and are the responsibility of the water supplier (the retail water businesses in Melbourne).

Melbourne Water and the retail water companies have recently amended the water quality standards (Schedule 3) in the Bulk Water Supply Agreements (BWSAs). This will ensure consistency with the standards in the Regulations that the retail water businesses must meet at customer taps. The new regulations came into force on 19 July 2005.

Melbourne Water has requirements to meet service standards for the Essential Services Commission, which came into force at the beginning of 2005. These standards are based on the standards in the BWSAs.

Melbourne Water also sets some operational targets compatible with statutory requirements. The targets aim to allow Melbourne Water to meet its obligations under the BWSAs and enable the retail water businesses to deliver water in accordance with the conditions of their operating licences. These conditions include compliance with health related parameters of the Australian Drinking Water Guidelines 2004.

Statutory Compliance

Fluoridation Plant Reliability

Compliance with Health (Fluoridation) Act (1973)

Based on Long Term (12 mth) Average Dosage not to exceed 1 mg/L

Treatment Plant	Compliance			
	Q2 05/06	Q3 05/06	Q4 05/06	Q1 06/07
Cardinia				
Research/Winneke				*
Monbulk				
Silvan-Olinda				
Silvan-Preston				
Silvan-Waverley				
Yan Yean		**	**	

* Research Plant offline 15/06/2006 and replaced by new Winneke Plant online 07/09/2006.

** Yan Yean Reservoir and Plant off line from 1/02/2006 to 30/06/2006.

Compliance achieved		Not applicable		Compliance not achieved	
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During Quarter One the average fluoride concentration at all plants did not exceed 1 mg/L.

Quarterly Compliance with Health (Fluoridation) Act (1973)

Quarterly Average Dosage to be between 0.7 - 1.2 mg/L

Treatment Plants	Compliance			
	Q2 05/06	Q3 05/06	Q4 05/06	Q1 06/07
Cardinia				
Research/Winneke				*
Monbulk				
Silvan-Olinda				
Silvan-Preston				
Silvan-Waverley				
Yan Yean		**	**	

* Research Plant offline 15/06/2006 and replaced by new Winneke Plant online 07/09/2006.

** Yan Yean Reservoir and Plant off line from 1/02/2006 to 30/06/2006.

Compliance achieved		Not applicable		Compliance not achieved	
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During Quarter One all sites were compliant on a quarterly basis.

Compliance Summary

Summary of Compliance for Corporate Public Health Targets and Performance Standards for Water Quality in the Bulk Water Supply Agreements (BWSAs] and the Essential Services Commission (ESC) Standards

Quarter One 2006/07

Compliance Measure	Target Met
Disinfection Plant Reliability (Corporate target - combined reliability measure of 96%).	Yes
Supply to retail companies at entry and water quality monitoring points - <i>E.coli</i> . (Corporate target - 100 % of samples < 1 org/100 mL)	Yes
Trihalomethanes and Haloacetic Acids (BWSA - 100% of samples meet standards)	Yes
Aluminium - aesthetic parameter (Compliance with ESC Standards)	No
Turbidity - aesthetic parameter. (Compliance with ESC Standards)	Yes

New regulations under the *Safe Drinking Water Act 2003* (SDWA) have resulted in additional chlorine based chemicals (disinfection by-products) being included in the BWSA variations that came into effect on 1 January 2005. These are Chloroacetic Acid, Dichloroacetic Acid and Trichloroacetic Acid. Melbourne Water also has requirements to meet service standards for the ESC starting from this time. Aluminium and turbidity are now regulated parameters under the SDWA and have been included in the BWSAs and ESC standards. Aluminium and turbidity are aesthetic rather than health based parameters.

During Quarter One of 2006/07, Melbourne Water complied with the health parameters of the BWSA. However for the aesthetically based parameter of aluminium (soluble), 5 of 16 samples at two sites associated with the Yan Yean Treatment Plant did not comply with the target.

Detailed information on quarterly compliance against the indicators is given in the following sections.

Bulk Water Supply Agreements and Corporate Compliance Details

Plant Disinfection Reliability – Primary and Secondary Plants

Primary disinfection plants are those that disinfect water from systems open to faecal contamination, such as major storage reservoirs.

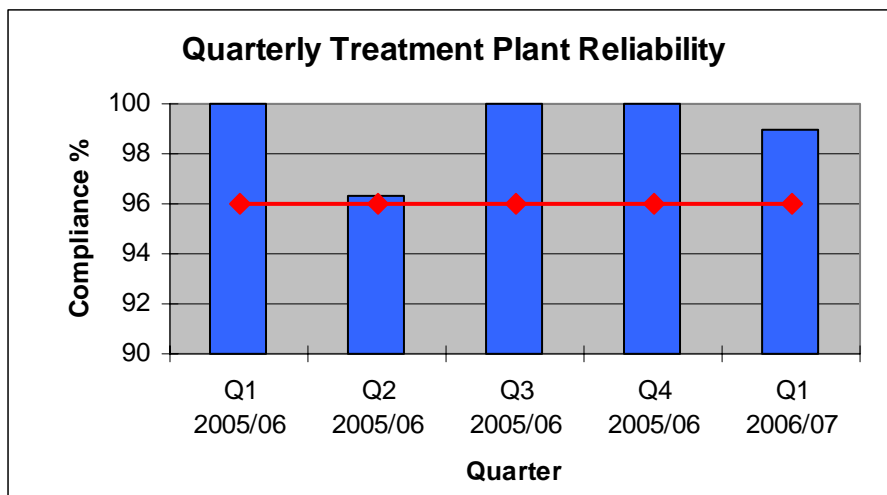
Secondary disinfection plants are those that disinfect after the water has initially been treated by a primary plant. They disinfect within a closed system to control regrowth of bacteria in the pipe network.

There are up to 37 primary and secondary plants included in the performance assessment for reliability compliance. The actual number in operation depends on system configuration during the quarter.

The established reliability measures for primary and secondary chlorination plants in operation are:

- Primary chlorinators meeting the chlorine contact time requirements for 99.9% of available operating time, and
- Secondary chlorinators within their operating range for 95% of available operating time

Melbourne Water has a target for 96% of all plants to meet the reliability measures. The target was met in Quarter One.

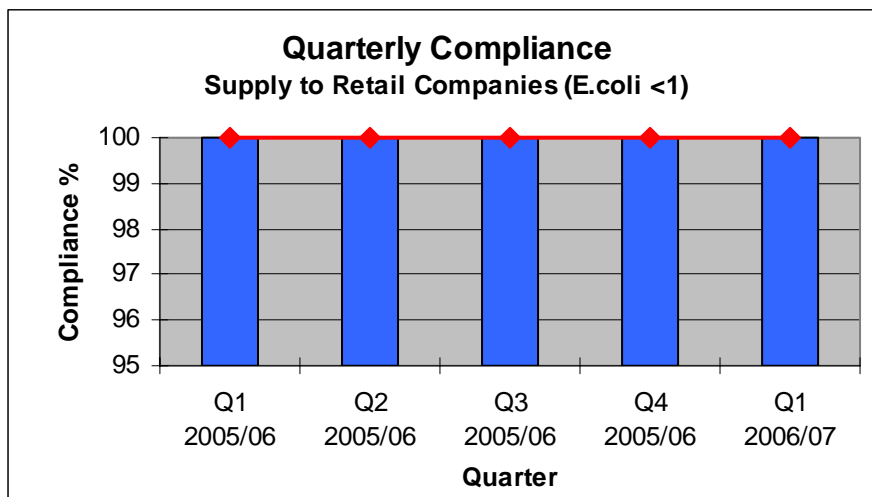


Supply to Retail Companies – E.coli

The overall objective is for no *E.coli* to be present in the water supply system. All detections are investigated and appropriate actions are taken. The chart below shows the percentage of samples taken at entry points and water quality monitoring points, which contain less than one *E.coli* bacterium per 100mL.

Entry points to supply are monitoring points immediately downstream of primary disinfection. Water quality monitoring points are other points at storages or water mains within the wholesale transfer system. They are identified in the BWSAs with the retail water businesses.

Melbourne Water's target is for 100% of the samples taken to be free from *E.coli* bacterium. It is more stringent than the requirements of the BWSAs that specify a target of 99% for each monitoring point. During Quarter One this target was met.



Disinfection By-products - Trihalomethanes (THMs) and Haloacetic Acids

Trihalomethanes and the related haloacetic acids are present in drinking water principally as by-products of disinfection using chlorine. Some epidemiological studies have reported associations between the ingestion of chlorinated drinking water with a range of health matters including increased cancer mortality rates.

The new Bulk Water Supply Agreements (BWSA) with the retail water businesses contain targets for Haloacetic Acids that are those that were expected to be in the final regulations under the *Safe Drinking Water Act 2003* (SDWA). Some minor variations were contained in the final regulations. In simple terms, the targets are consistent with standards in the SDWA regulations, which adopt the health limits of the Australian Drinking Water Guidelines. For Trihalomethanes, the target is more stringent than in the regulations.

Routine sampling at selected sites is carried out to provide adequate data on the quality of water supplied to the retail water businesses. It is currently performed on a quarterly basis. An expanded monitoring program began in Quarter 1 of 2004/05 at the time the SDWA came into effect. During Quarter 1 of 2006/07 all targets were met.

Performance against Bulk Water Supply Agreement Targets

Parameter	BWSA targets	Q2 2005/06	Q3 2005/06	Q4 2005/06	Q1 2006/07
Chloroacetic Acid	0.15 mg/L				
Dichloroacetic acid	0.10 mg/L				
Trichloroacetic acid	0.10 mg/L				
Total Trihalomethanes	0.15 mg/L				

Target met		Action required & taken		Action required & not taken	
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Other Chemical and Physical Parameters included in Bulk Water Supply Agreements (BWSAs) and reported to the Essential Services Commission (ESC)

The ESC service standards and the revised BWSAs have requirements for aluminium and turbidity, which are aesthetic rather than health based parameters.

The standards set by the BWSAs and ESC have different underlying concepts in that the BWSAs' assessment is on individual rolling average performance achieved at each sample site while the ESC performance measures are assessed on annual aggregates for all sites.

For aluminium, the ESC target is more stringent than in the SDWA regulations, which relate to retail customers' taps. For turbidity, targets are based on achieving or bettering recent historical performance. Performance against the ESC service standards is shown in the table.

During Quarter one the target for turbidity was met but the aluminium target was not. For the aesthetically based parameter of aluminium (soluble), 5 of 16 samples at two sites associated with the Yan Yean Treatment Plant did not comply with the target. The BWSA/ESC limit is 0.1 mg/L and the highest of the failures was 0.12 mg/L. Given the Australian Drinking Water Guidelines and Safe Drinking Water Act limit is 0.2mg/L, the results have no significance in terms of public health and customer impact. Levels returned to <0.1 mg/L after some minor dosing adjustments by United Utilities (operators of the Yan Yean plant).

Performance against ESC service standards *

Parameter	Q2 2005/06	Q3 2005/06	Q4 2005/06	Q1 2006/07
Aluminium (mg/litre)				
Turbidity (NTU)				

NTU = Nephelometric Turbidity Units

Target met for this quarter		Target not met for this quarter * (see note)	
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Note: The ESC assesses compliance with these service standards on an annual basis, rather than for quarterly periods as shown above. Quarterly results are therefore an indication of likely annual compliance. However in the case of aluminium a single failure at any time will result in annual non-compliance as the Essential Services Commission (ESC) service standards contain a standard for “Aesthetic standards (aluminium)” of 99.88% of the aggregated number of samples from all monitoring points to comply with the BWSA provisions.

A report on aluminium non-conformance in drinking water for 2005/06 was provided at the EHSC meeting on 17 August 2006.

RECREATIONAL WATER ENVIRONMENT

Major Incidents/Initiatives/Issues

Yarra River Action Plan

The Yarra Coordinating Committee was established to assist Melbourne Water plan and coordinate the programs in the *Yarra River Action Plan*. The Committee, chaired by Professor Barry Hart and comprising the heads of key agencies with responsibility for the River, has met six times during 2006.

The initial focus of the Committee was to produce a program plan that outlined the activities and projects being carried out in 2006 as part of the *Yarra River Action Plan*. The Program Plan was presented to the Minister for Water in August 2006. The Minister for Water requested that Professor Hart promote the program plan and activities through local papers and local council newsletter. The Minister also reinforced the importance of the Yarra Coordinating Committee.

The Chair and Committee are considering the ongoing contribution the Committee can make to improve the environmental and human health of the Yarra River. The Committee has recently turned its attention to identifying gaps and opportunities to complement government agency programs. Initially, the Chair and Committee have been examining implications of new research undertaken by Monash University (Chris Walsh and Tim Fletcher) for priorities and opportunities for retrofitting urban areas with water sensitive urban design and management of septic tanks. The Committee will oversee an international scientific review of this research on the role of septic tanks and in retrofitting urban areas with water sensitive urban design.

Upcoming priorities for the Committee include the preparation of an annual progress report for submission to the Minister for Water early 2007.

Yarra River Priority Project: faecal investigations

The faecal investigations program is on schedule. Primary investigations for Harper Street, Prahran, Kew and Locksley Road Main drains are complete.

Several discussions were held with EPA Victoria during the month over its new Yarra River Investigation and Response Program (the "pollution strike force"), announced by the Minister for Water in July. The potential for overlap and duplication is recognised and being avoided through the setting up of improved communication systems.

At a preliminary meeting with Melbourne Water and EPA Victoria (EPA), City of Melbourne staff were enthusiastic about cooperating with Melbourne Water and the EPA on the Elizabeth Street Drain (City) investigation. Sampling began in October and link in with an EPA litter blitz on the same stormwater system. A second meeting with the City of Melbourne will discuss access to the underground stormwater system and traffic management plans. During an inspection of potential access sites, an actual ruptured private sewer was found adjacent to Thierry Street and EPA alerted. It

was repaired the next day. The length of time this source has been contaminating the main drain is unknown.

Further investigations were commissioned in two major stormwater systems – using faecal sterols. Data arrived from the South Australia Water laboratory and results still pointed to significant human sewage contamination in the Prahran Main Drain and Harper Street Main Drain (Abbotsford) systems – even after locating and repairing four collapsed sewerage lines in the latter system. Stakeholders will meet to discuss an investigatory response to these results.

During an earlier investigation on the Hawthorn Main Drain system, an apartment in a block situated in Lynch Street Hawthorn was discovered with its sewer pipe connected to the council stormwater system. The Body Corporate informed Melbourne Water that plumbers had fixed the cross connection.

Planning is well advanced for a full screening stage investigation of Gardiners Creek. It will involve dry and wet weather sampling of the main creek and about 15 of the major drains running into the creek.

Statutory Compliance and Reporting

Melbourne Water has no existing statutory requirements for public health performance in regard to waterways. There are requirements for sewerage in the form of certain conditions that apply to the EPA Victoria (EPA) licences for the Eastern and Western Treatment Plants. The key health parameter is *Escherichia coli* (*E.coli*), which is defined in Appendix 1.

Bacteriological Conditions of Receiving Waters Required under the EPA Victoria Licence - Eastern Treatment Plant.

Melbourne Water is required to monitor the effect of the treated wastewater discharged from the Eastern Treatment Plant on the bacteriological quality of the receiving waters near the point of discharge at Boags Rocks. Monitoring is carried out each week in the pipeline upstream of the actual discharge and at six designated locations along the foreshore, including Gunnamatta Beach. Licence requirements are for samples to be measured for *E.coli*.

(a) Statutory Compliance and Reporting – Waste Discharge Sampling Point

The EPA licence specifies annual median and 90th percentile performance limits of 200 org/100mL and 1000 org/100mL respectively, for *E.coli* at the discharge sampling point. For the first quarter of 2006/07 the median and 90th percentile are on target to meet annual limits.

Compliance with specified levels of E.coli

Parameter	Compliance target
<i>E.coli</i> - annual median.	
<i>E.coli</i> - annual 90th percentile	

Compliance on target

Compliance not on target

(b) Statutory Reporting - Foreshore Locations

The EPA Victoria Licence requires monitoring of the receiving environment in accordance with the Eastern Treatment Plant Environmental Improvement Plan, which is a component of the Licence. The objectives for receiving water quality are defined by the State environment protection policy (Waters of Victoria). The limit for *E.coli* specified in the policy for primary contact recreation is a median of not more than 150 org/100mL. The limits for Enterococci are a median and 75th percentile of 35 org/100mL and 150 org/100mL respectively (Appendix 2). For the first quarter of 2006/07, compliance with the State environment protection policy was met.

Reporting of Results in Accordance with Statutory Requirements

Parameter	2006/07			
	Q1	Q2	Q3	Q4
<i>E.coli</i> - median				
Enterococci - median and 75%ile				

Reporting not required
 Report required and submitted

Report required but not submitted

Bacteriological Conditions of Receiving Waters Required under the EPA Victoria Licence - Western Treatment Plant.

The EPA Victoria licence for the Western Treatment Plant requires Melbourne Water to manage the effect of the discharge on the bacteriological conditions of the receiving waters of Port Phillip Bay. Long term monitoring has occurred at the actual discharges from the Plant and offshore at two locations, which are accessible from public roads. Samples are taken each week and measured for *E.coli*.

Statutory Compliance and Reporting

Before accreditation in August 2000, the EPA licence required weekly monitoring for *E.coli* at the four discharge points. This practice has continued as an appropriate means of assessing operating performance. No guidelines or limits have been established and results are only required as part of the annual report to the EPA in September each year.

Again, before accreditation, the EPA Licence required monitoring at the two foreshore locations and reporting of results when limits were exceeded. These were a geometric mean of 1000 org/100mL and an 80th percentile of 2000 org/100mL over each 42 day period beginning 1 January of each year. Although this is not a specific requirement of the accredited licence, Melbourne Water continues this monitoring as part of the overall program and to measure performance against the State environment protection policy (Waters of Victoria). For the first quarter of 2006/07 both geometric mean and 80th percentile results were below the traditional targets and compliance with the State environment protection policy was met.

Comparison of Results against Traditional Licence Requirements

Parameter	2006/07			
	Q1	Q2	Q3	Q4
<i>E.coli</i> - geometric mean				
<i>E.coli</i> - 80th percentile				

Reporting not required		Report required but not submitted	
Report required and submitted			

Meeting “State environment protection policy” Objectives

As part of Melbourne Water’s long term Waterway Water Quality Monitoring Network, *Escherichia coli* (*E.coli*) is monitored at 73 sites with a more intensive weekly monitoring program in the Yarra and Maribyrnong Rivers (Yarra Watch) all year round and other key recreational sites in the summer.

The following information provides details on the levels of *E.coli* in Melbourne’s waterways using State environment protection policy (SEPP) objectives as long-term targets. An explanation of the *E.coli* bacteriological contamination indicator in relation to swimming is contained in Appendix Two.

A revised State environment protection policy (Waters of Victoria) was issued in June 2003. Objectives became more stringent in an endeavour to increasingly improve water quality. New targets applied to the Melbourne Water region, excluding the Yarra and Western Port catchments, where regionally specific SEPPs are in force.

SEPP objectives are established according to the “beneficial uses” associated with the particular waterway. In the case of “primary contact recreation” involving direct contact with the water, there is a possibility that water may be ingested. The general policy objective for “primary contact recreation” is a median *E.coli* of <150 org/100mL, although it remains as a geometric mean of <200 org/100mL in the Yarra and Western Port catchment policies. In waterways where only “secondary contact recreation” occurs, the policy objective is less stringent.

Presentation of results in this quarterly report has been revised from last year in order to provide a better comparison against SEPP objectives. This report uses a rolling twelve months of *E.coli* data and applies geometric means and 50th percentiles (medians) dependant on the particular SEPP for the waterway. Sites have now been grouped by SEPP schedule rather than by regionally named catchments.

Previous quarterly reports used a simplified calculation (medians) to assess levels of *E.coli*. This was done for ease of interpretation and to enable comparison across the entire region. However, the new approach is based more closely on the individual SEPP rather than a comparison between waterways.

Although comparison is made against SEPP, actual compliance is not assessed. However the use of monthly samples over 12 months gives a good indication of performance against the SEPPs - incorporating a range of seasons and a greater number of samples, similar to other environmental parameters in the SEPPs.

Monitoring regimes needed to assess true compliance, as specified in the SEPPs, would be:

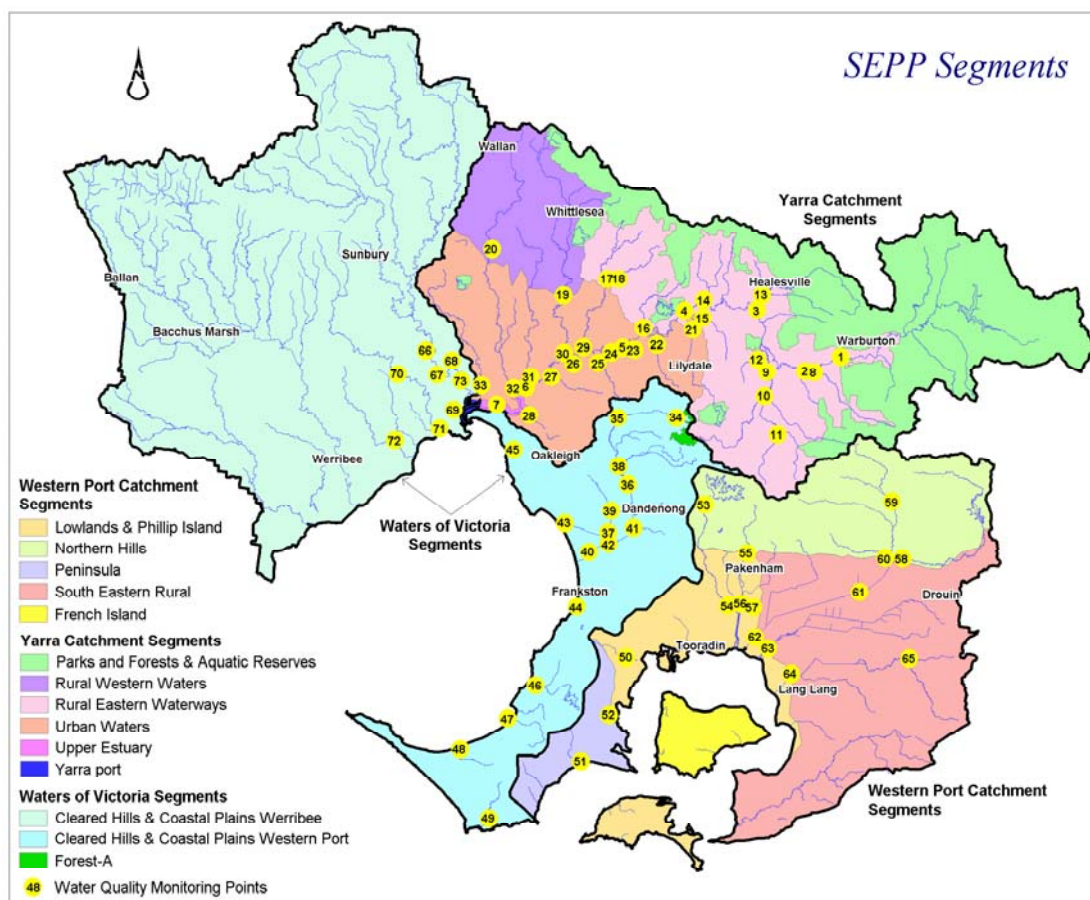
- Waters of Victoria – ‘the median of five samples taken at regular intervals within 30 days’,
- Waters of Western Port and Catchment – ‘a 42 day geometric mean’, and
- Waters of the Yarra Catchment – ‘geometric mean of not less than five samples taken over a period of not more than 42 days’.

With Melbourne Water's current program, it is only possible to determine true SEPP compliance using the Yarra Watch sites where results are obtained weekly. Yarra Watch results are provided later in this report.

Overall results for the quarter are shown in the following table. Future quarterly reports will eventually show results covering the present quarter and the previous three quarters.

A map of the SEPP segments and sampling points is also shown. An expanded monitoring program to cover the Werribee Cleared Hills and Coastal Plains Segment, now managed by Melbourne Water, is being developed.

Waterway Water Quality - Quarter One of 2006/07



Compliance Performance Number of sites and performance rating

SEPP Schedule & Segments	No. of Sites	Q1 2006/07	Q2 2006/07	Q3 2006/07	Q4 2006/07
Waters of the Yarra Catchment					
# Rural Eastern Waters	15	7			
# Rural Western Waters	2	2			
# Upper Estuary	1	0			
# Urban Waters	15	1			
Waters of Victoria					
# Cleared Hills & Coastal Plains Werribee/ Maribyrnong	8	5			
# Cleared Hills & Coastal Plains Western Port	15	5			
# Forest-A	1	1			
Waters of Western Port & Catchment					
# Lowlands & Phillip Island	7	4			
# Northern Hills	5	1			
# Peninsula	1	0			
# South Eastern Rural	3	0			

Yarra Catchment SEPP Objective – *E.coli* Geometric mean 200 org/100mL

Waters of Victoria SEPP Objective – *E.coli* Median 150 org/100mL

Waters of Western Port SEPP Objective – *E.coli* Geometric mean 200 org/100mL

Number of sites passing SEPP	Nil	< Half	= or > Half	All
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Yarra Watch Program

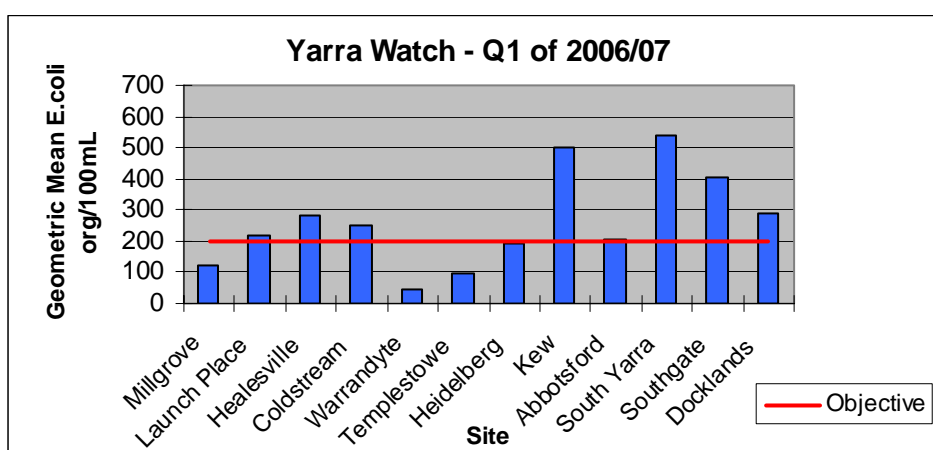
The Yarra Watch Program, which commenced in March 2005, is separate from Melbourne Water's long-term routine monitoring program. Yarra Watch is designed to provide information to the public on the water quality trends in the Yarra. It involves weekly sampling for *E. coli* and Enterococci at 12 Yarra River sites. The program is managed by Melbourne Water with results published on the EPA Victoria website. It covers the Yarra from the Docklands to Millgrove near Warburton.

The Yarra Watch results and comparison with equivalent results for 2002 to 2005 are shown below. Docklands, South Yarra and Templestowe sites have only been monitored since March 2005. There was improved water quality in Quarter 1 due to the dry conditions. Even so there were two occasions when EPA Victoria issued stormwater advisory notices for the river following rainfall events. South Yarra continues to be the worst performing site.

Yarra Watch results for 2005/06
(Main source of data: EPA Victoria web site)

River Section	Sampling Site	2002	2003	2004	2005	2005/6		2006/7
						Q3	Q4	
Lower Yarra	Docklands	*	*	*	564	556	544	289
	Southgate	879	677	563	460	412	456	404
	South Yarra	*	*	*	777	1181	613	538
	Abbotsford	288	276	181	308	324	336	206
Middle Yarra	Kew	327	624	237	358	264	351	498
	Heidelberg	439	389	320	247	547	267	195
	Templestowe	*	*	*	204	362	174	99
	Warrandyte	154	167	112	116	193	109	43
Upper Yarra	Coldstream	143	171	171	275	291	326	251
	Healesville	209	190	170	258	409	299	281
	Launching Place	402	238	209	240	305	248	221
	Millgrove	173	119	144	152	388	160	123

Complies with SEPP objective		Exceeds SEPP objective	
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All figures are *E. coli* calculated as geometric means in org/100mL. Compliance is measured against the SEPP target for primary contact of a geometric mean for *E. coli* of 200 org/100mL. This target applies to all the listed sites. For secondary contact the traditionally accepted target is a geometric mean of 1000 org/100mL.
* New sites established under Yarra Watch Program.

RECYCLED WATER

Major Incidents/Initiatives/Issues.

Recycled Water from Treatment Plants

There were no significant health compliance matters related to recycled water during Quarter 1.

WERRIBEE AGRICULTURE

Major Incidents/Initiatives/Issues.

There were no significant health compliance matters during the quarter.

Statutory Compliance

Compliance with Livestock Disease Control Act 1994

During the quarter, all cattle sales conducted by Werribee Agriculture complied with S.44 (1) of the *Livestock Disease Control Act 1994*.

APPENDICES

Appendix One: Guide to Terms

Term/Parameter	Unit	Definition
<i>Escherichia coli</i> <i>E.coli</i>	Number of organisms per 100mL	A common bacterium from the intestines of warm-blooded animals including humans. Used as the primary microbial indicator of faecal contamination. For drinking water, performance is assessed by the percentage of samples with <i>E.coli</i> less than 1 organism per 100 mL of water at entry and monitoring points.
Enterococci	Number of organisms per 100mL	A group of bacteria found in the gastrointestinal tract of warm-blooded animals. Recognised as the best microbial indicator for measuring faecal contamination of marine recreational waters. Quality is assessed using the total number of organisms per 100 mL of water at beach sampling points.

Appendix Two: Bacterial indicators

Escherichia coli is used throughout the world as an indicator of faecal contamination as it is associated with the presence of pathogenic bacteria and viruses in water. It is the most reliable indicator organism for detecting any faecal contamination in drinking water supplies.

For recreational waters both *E.coli* and enterococci are used as bacterial indicator organisms. Melbourne Water monitors waterways and receiving waters for the presence of *E.coli* through the Water Quality Monitoring Network and Licence Monitoring programs. Measurement of enterococci provides the best bacterial indicator of faecal contamination of marine recreational waters. EPA Victoria monitors enterococci at Port Phillip Bay beaches as part of the annual Beach Report program. Scientific studies have demonstrated an association between enterococci and the degree of health risk to swimmers. The overall risk of illness from swimming in the Bay is low.

State environment protection policies include acceptable levels of *E.coli* (and enterococci) for swimming. In the event of unacceptable results, EPA Victoria makes a recommendation to local Councils and the general public to avoid swimming in the contaminated area.

A revised State environment protection policy (Waters of Victoria) was issued in June 2003 and EPA Victoria has adopted the water quality guidelines in the "Australian and New Zealand Guidelines for Fresh and Marine Water Quality 2000". In these, the primary contact guideline for *E.coli* is for a median of five samples over one month being <150 org/100mL (as against a geometric mean of <200 org/100mL). This change to *E.coli* will have no impact in regard to Melbourne Water's marine

discharges but may impact the long-term attainment of State environment protection policy water quality objectives in waterways.

Bacteriological contamination in Port Phillip Bay is usually confined to beaches near stormwater or stream outlets. Sources of contamination, which enter the Bay through urban streams and stormwater drains, are derived from domestic animals, birds, herbivores, septic tank outflows and sewage spills.

Appendix Three: Melbourne Water's role in blue-green algae management

Melbourne Water conducts algal bloom monitoring of water bodies under its control and has algal bloom response plans in place. The water bodies include water supply reservoirs, sewage treatment lagoons, retarding basins and recreational lakes.

Water bodies are selected for monitoring on the basis of history of incidence, susceptibility to blooms and potential consequences. If a bloom of potentially toxic blue-green algae is discovered in a water body, a number of management actions are considered and implemented by the responsible management group. Toxicity testing can be undertaken, along with aeration of the water body, posting of signs, media releases and increased monitoring.

The Department of Sustainability and Environment (DSE) is the state wide coordinator for addressing blue-green algal blooms within Victoria. A network of eighteen "convening agencies" has been established to provide a sub-coordinating role and a means of managing outbreaks of blue green algae, which occur on a regional scale, i.e. when more than one local water manager is involved.

The convening agencies for the State are drawn from rural water authorities, non-metropolitan urban water authorities, Melbourne Water and DSE regions. Melbourne Water, through the Infrastructure Group, is the convening agency for the metropolitan area (Bunyip, Yarra and part of the Maribyrnong catchments).

The role of the convening agency is to compile a regional coordination plan and arrange for the establishment of a response group to manage the bloom. In the event of a bloom, the DSE, Department of Human Services and the relevant convening agency are informed in writing by the authority responsible for the waterway or water body in question.