



**Melbourne  
Water**

**Environmental Compliance**

***Quarterly Report***

**Quarter Two 2006/2007**  
**(October, November, December)**

## **Incidents, Initiatives and Issues**

### **Incidents**

#### *Werribee Irrigation District Lettuces*

Southern Rural Water had received reports from Werribee Irrigation District irrigators that lettuces planted in mid September 2006 had exhibited inhibited growth. The lettuces had been irrigated with recycled water from Western Treatment Plant. Southern Rural Water declared this to be an incident, as did Melbourne Water. Melbourne Water contributed to the investigations conducted into the incident coordinated by the Department of Primary Industry.

Testing has not identified a definitive cause of the incident. Department of Primary Industry is completing analysis of the data gathered and is preparing a report that will be subject to peer review. Once this is completed, Southern Rural Water will initiate an independent review of the investigation and continue to communicate further with the affected growers.

#### *Harrop Creek Erosion*

Heavy rainfall on 2 November 2006 caused bypass erosion control measures on a pool/riffle construction project on Harrop Creek, Mt Martha to be exceeded, resulting in sediment-laden waters flowing downstream. A contractor was carrying out the project as part of a local development and local concern over the development meant that a resident had complained to EPA Victoria about the incident. EPA Victoria considered issuing a Pollution Abatement Notice to the contractor but decided against this action following prompt action by the contractor in implementing improved silt control measures that satisfied both Melbourne Water and EPA Victoria.

### **Initiatives and Issues**

#### *UNESCO Urban Aquatic Habitats Publication*

Melbourne Water employee Sophie Bourguès had been contacted by UNESCO to contribute to a publication on the management of urban aquatic habitats. A chapter titled *Ecosensitive Approaches to Managing Urban Aquatic Habitats: Technical Measures and Implementation* will be included in the book to be published in early 2007.

#### *Werribee River Geomorphology Overview and Frog Report*

As part of broad stream health data collection in the Werribee Catchment a geomorphology overview of the keys issues and recommended management approaches associated with stream form and a frog report summarizing available information on the distribution, significance and ecology of frog populations was finalised during the quarter. This information will form part of an integrated report on the health and key waterway management issues of the Werribee River system.

### *Stony Creek (West) Pollution Tracking- Drain Inspections*

Stony Creek has been identified as a problematic creek in terms of water quality, regularly having Alert Level Reports to EPA Victoria. Pollution was considered to be associated with wet weather. Melbourne Water investigations in 05/06 further investigated pollution sources in Stony Creek with results indicating that a number of drains in particular contributed largely to decreased water quality.

During 2006/07 Melbourne Water further targeted these drains to try and isolate pollution sources. These drain investigations proved to be successful and a significant source of pollution was isolated. Working with the EPA Victoria, prosecutions are now pending and the control of the pollution source will lead to improved water quality in Stony Creek.

### *Sewerage Transfer System Odour Management*

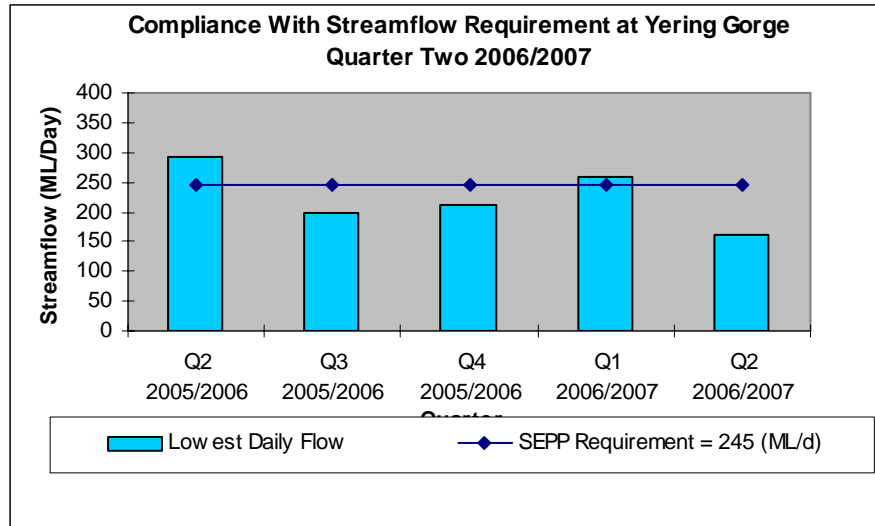
Melbourne Water's Operations Group implemented a manhole and vent stack inspection program to minimise the risk of odour emissions from the Sewerage Transfer System. The program has resulted in identifying four sites as having potential for odour complaints. Works were undertaken to rectify the issue at each site.

Melbourne Water's Strategy and Planning and Strategy Group implemented an odour-monitoring program at selected "hot spots" within the sewerage transfer system to determine the best odour treatment solutions to minimise the emission of offensive odours into the local community.

These initiatives should reduce the number of odour complaints from the sewerage transfer system

## Statutory Compliance

### State Environment Protection Policy Requirement for Passing Flow in the Yarra River



Melbourne Water is required by Schedule F7 (Waters of the Yarra Catchment) of the Waters of Victoria State environment protection policy to provide for, to the extent practicable, a flow of no less than 245 ML/day in the Yarra River downstream of the Yering Gorge diversion. The gauge at Yering Gorge below the pumping station is used to manage pumping into Sugarloaf Reservoir to ensure the minimum flow is met.

In accordance with the Yarra Drought Response Plan, when flows at Yering Gorge fall below 245 ML/day, Melbourne Water ceases filling Sugarloaf Reservoir from Yering Gorge Pumping Station. The Yarra Drought Response Plan also requires Melbourne Water to manage diversions from the Yarra by applying progressively tighter restrictions.

Yarra River monitoring by Melbourne Water has shown that when flows fall below 150 ML/day environmental conditions deteriorate due to low dissolved oxygen levels in the river. Melbourne Water considers releasing water to ensure environmental conditions in the Yarra River do not deteriorate when flows fall below 150 ML/day at Yering Gorge.

During this quarter, the minimum flow at Yering Gorge was 161 ML/day and Melbourne Water met the requirements of the Yarra Drought Response Plan.

## Sewerage System Summary of Statutory Compliance by Facility

### Summary of Compliance by Facility Quarter Two 2006/2007

Facility	Compliance * of Samples Q2 (%)	Non-Sample Compliance**	Sewage Spills***	Odour Complaints
Eastern Treatment Plant			0	0
Western Treatment Plant			0	0
Wastewater Transfer	N/A	N/A	0	2
Total	N/A	N/A	0	2

	<b>Compliance achieved for all parameters</b>
	<b>Compliance not achieved for one or more parameters.</b>

\* Compliance of samples details the compliance status for maximum/minimum/range or annual discharge parameters as indicated by the quarter's results.

\*\*Non sample compliance covers licence breaches for issues other than discharge parameter limits. Details on compliance breaches appear in following sections.

\*\*\*Sewage spills include all spill types (operational failures, compliant and non-compliant less than 1:5 rainfall event spills and greater than 1:5 rainfall event spills)

## Sewerage System Statutory Compliance Detail

### Compliance of Samples – 2nd Quarter 2006/2007

The following table shows compliance of Melbourne Water's wastewater treatment plants with parameters in EPA Victoria licences where limits are expressed as a maximum, minimum or a range.

#### Treatment Plant Compliance with EPA Victoria Licences by Parameter \* Quarter Two 2006/2007

SITE	Amm	Surf	Metals	PH	D.O.	Flow	TRC	Other#
	Max	Max	Max	Range	Min.	Max	Max	
WTP all outlets								
ETP								
Air Emissions								

	<b>Compliance achieved</b>
	<b>Compliance not achieved** - See following sections for details</b>
	<b>Not applicable</b>

\* See Appendix One for a guide to the above parameters and Appendix Five for the location map of Western Treatment Plant Outlets.

# Parameters that are less significant and rarely fail to meet the required standard.

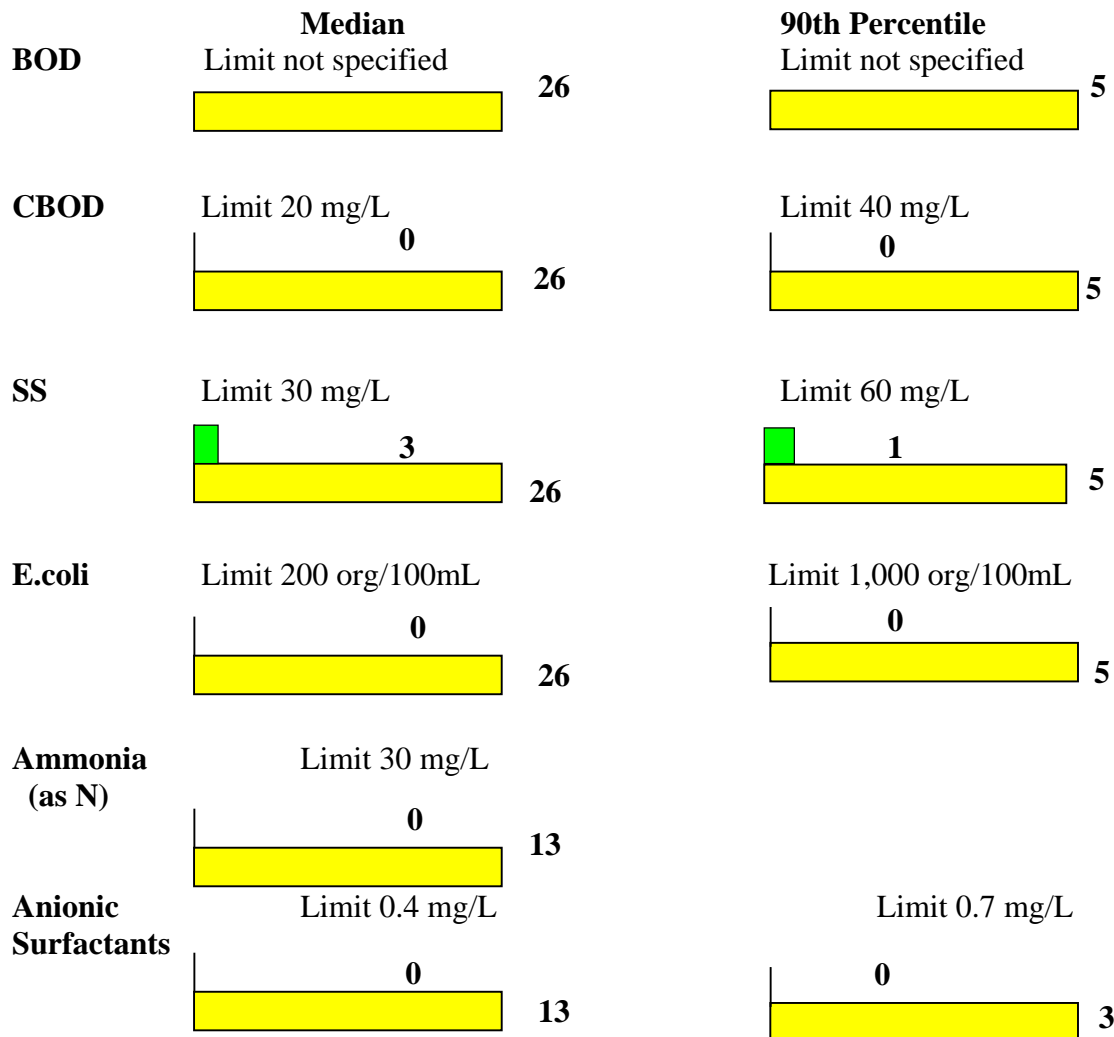
\*\* EPA Victoria is given an explanation for each non-compliance

## Eastern Treatment Plant

### Annual Parameters

The following details Eastern Treatment Plant's performance for critical parameters. Performance with respect to other parameters is reported here only if the results exceed licence limits, in which case explanatory information is contained in the following section.

**NOTE:** The plant has been granted a waiver for BOD compliance by EPA Victoria on the understanding that CBOD is also monitored and CBOD limits are complied with.



	Number of sample results to date greater than the Licence Limit – exceeds the total allowance for the year (licence breach).
	Number of sample results to date greater than the Licence Limit – exceeds the allowance for the year to date.
	Number of sample results to date greater than the Licence Limit – within the allowance for the year to date.
	Number of sample results during the year allowed to exceed the Licence Limit.

***General Licence Requirements***

No issues

***Groundwater Monitoring***

Consultants conducted groundwater monitoring during November 2006 and Melbourne Water received their report during the quarter.

Results were within the historical range found at the plant and consistent with previous years' results. There is evidence of groundwater mounding and elevated nitrogen, carbon, sulphate and metals concentrations in the vicinity of Sludge Drying Pans at ETP. Groundwater flow rate is slow and this localised impact has not impacted on groundwater quality beyond the Plant boundaries. Melbourne Water has an on-going program of Sludge Drying Pan refurbishment and the refurbishment program includes repairs to the impermeable liners in the pans to prevent groundwater contamination.

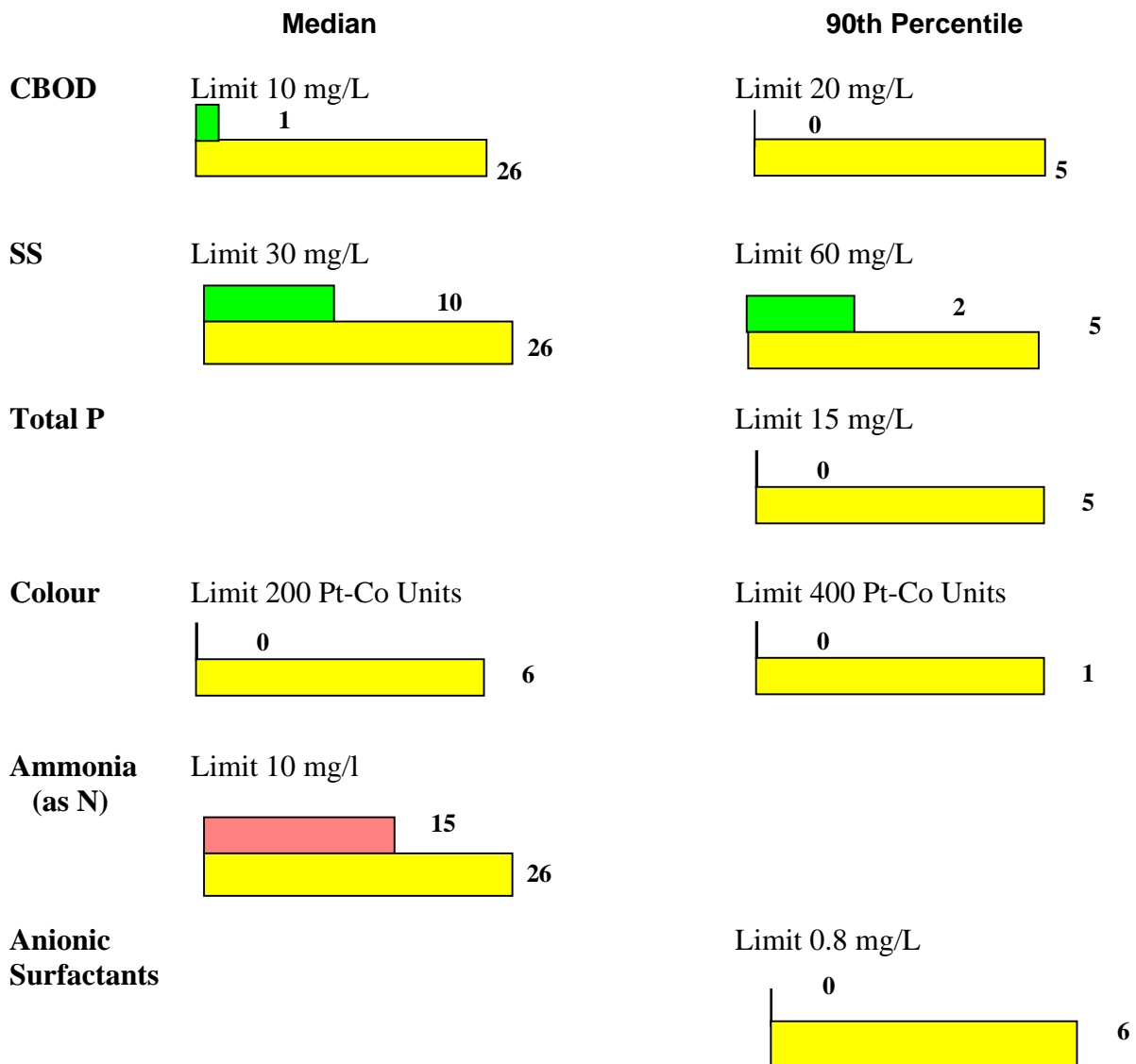
***Details of Licence Non-Compliance/Parameter Exceedances***

No issues.

**Western Treatment Plant**

The following details Western Treatment Plant’s performance for critical parameters. Performance with respect to other parameters is reported here only if the results exceed licence limits.

*Annual Parameters - flow weighted average of all four licensed outlets*



	Number of sample results to date greater than the Licence Limit – exceeds the total allowance for the year (licence breach).
	Number of sample results to date greater than the Licence Limit – exceeds the allowance for the year to date.
	Number of sample results to date greater than the Licence Limit – within the allowance for the year to date.
	Number of sample results during the year allowed to exceed the Licence Limit.

### ***General Licence Requirements***

No issues.

### ***Details of Licence Non-Compliance/Parameter Exceedances***

Ammonia levels exceeded the median limit, however this is typical of older lagoon performance during the winter/spring period. Ammonia levels have since diminished and will remain low for the remainder of the financial year.

Suspended solids exceeded the 90<sup>th</sup> percentile and median limits during the quarter. The recycling of significant quantities of higher quality effluent from the 15 East lagoon system increases the effect the poorer quality effluent from the other lagoon systems has on effluent discharged to the Bay. Melbourne Water has alerted EPA Victoria to this and is discussing options to make sure that discharge licence requirements are met.

### ***Groundwater Monitoring***

Melbourne Water is reviewing the Western Treatment Plant groundwater monitoring program to take into account recommendations made in the December 2005 groundwater monitoring report, the accredited licence audit report and the review of the Environment Improvement Plan.

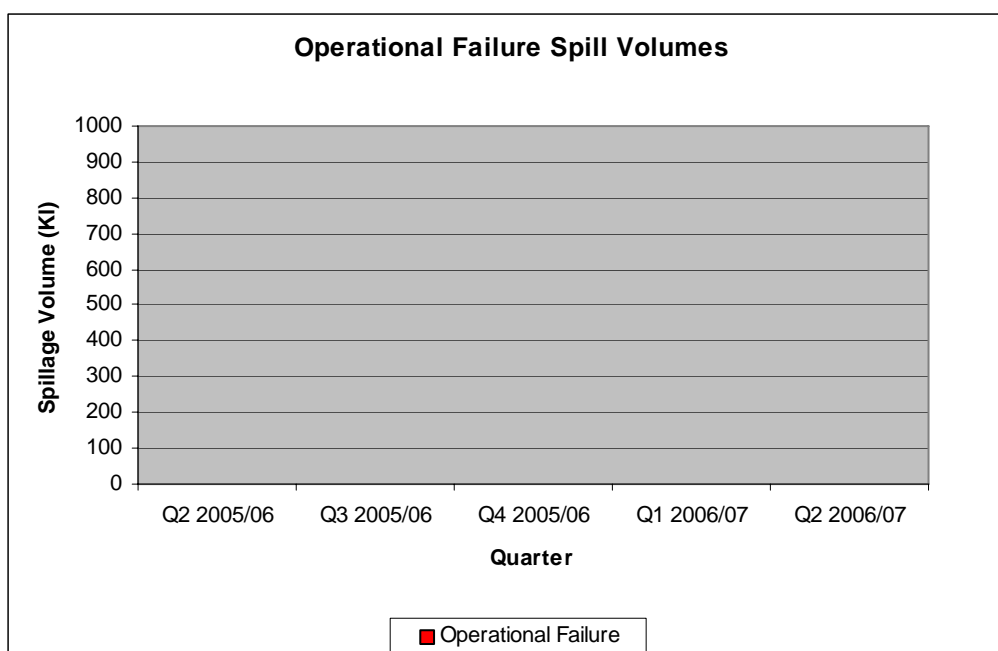
Issues that will be dealt with include the location of monitoring bores and the frequency of sampling and reporting. The program review has been completed and we are awaiting EPA Victoria input and approval for the revised program.

The new program is to begin in February 2007 with maintenance and decommissioning of some bores around the Western Treatment Plant. Sampling and testing of the groundwater bores will follow.

## Sewage Spills Summary

Number of Spills	Q2 2005/06	Q3 2005/06	Q4 2005/06	Q1 2006/07	Q2 2006/07
Number of Spills	3	3	0	1	0
Operational failure	1	0	0	0	0
<1:5 compliant	2	0	0	1	0
<1:5 non-compliant	0	0	0	0	0
>1:5	0	3	0	0	0
Significance*	Q2 2005/06	Q3 2005/06	Q4 2005/06	Q1 2006/07	Q2 2006/07
Minor (Rating 1 - 3)	2	1	0	1	0
Significant (Rating 4 – 5)	0	2	0	0	0
Not Rated	1	0	0	0	0
EPA Victoria Reporting Protocol Met	Yes	Yes	Yes	Yes	Yes

\* Melbourne Water reports spills according to the Melbourne Water-EPA Victoria spill reporting protocol that is contained in Appendix Three. The rating assigned to a spill is determined by applying the potential impact rating to the incident (refer to Appendix Two). If a spill is contained on site with no damage to the environment it will be reported in this report but not included in spills publicly reported.



### *Spills Due to Operational Failures*

There were no spills due to operational failure during the quarter.

The above graph indicates the volume of sewage spilt due to equipment breakdown or human error.

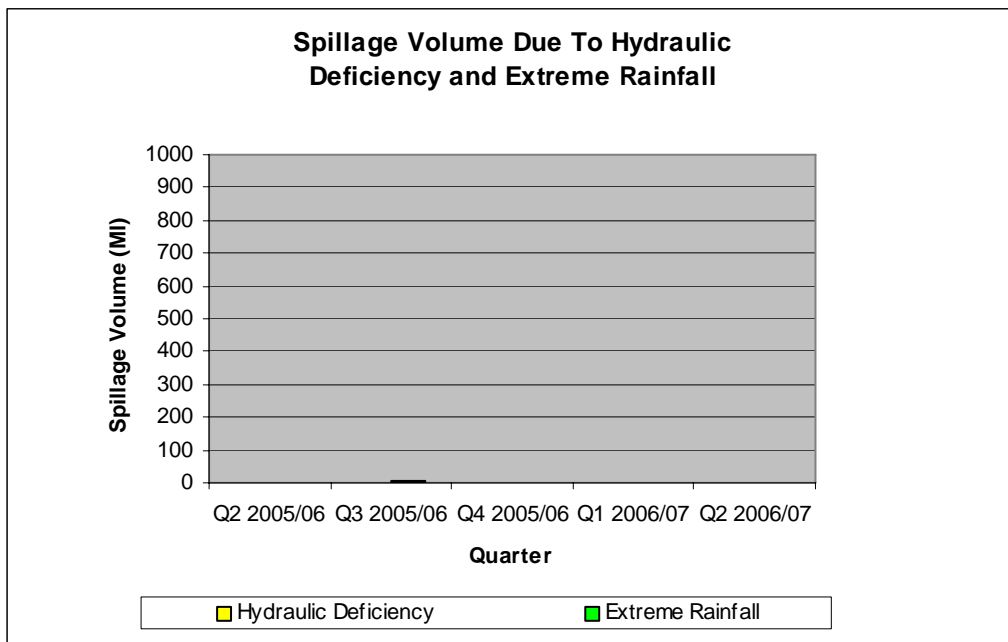
***Eastern Treatment Plant***

There were no spills at Eastern Treatment Plant during the quarter.

***Western Treatment Plant***

There were no spills at Western Treatment Plant during the quarter.

***Spills Due to Rainfall Events Greater than 1:5 Year Return Frequency (Extreme Rainfall) and Hydraulic Deficiency***

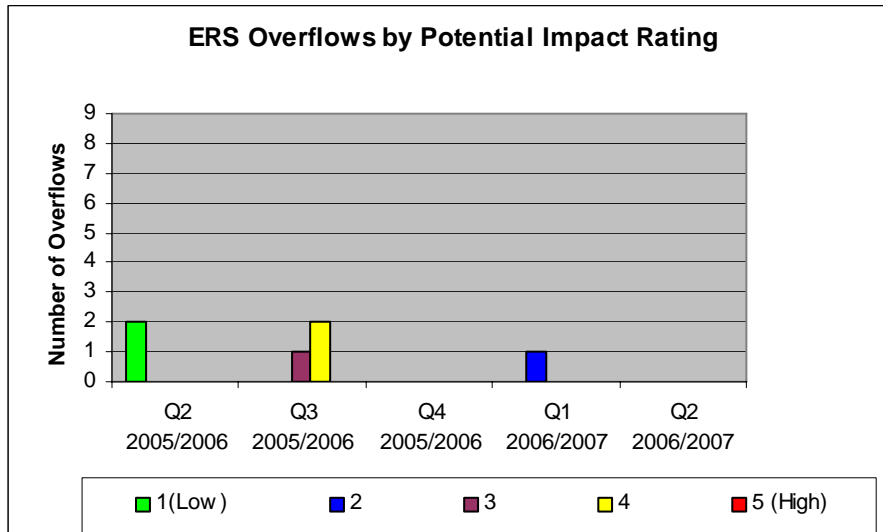


**Hydraulic Deficiency** - Spills due to insufficient pipe/pump capacity

**Extreme Rainfall** - Spills due to rainfall events greater than 1: 5 year return frequency

There were no spills due to hydraulic deficiency or extreme rainfall (greater than 1 in 5 event)

## ERS Overflows

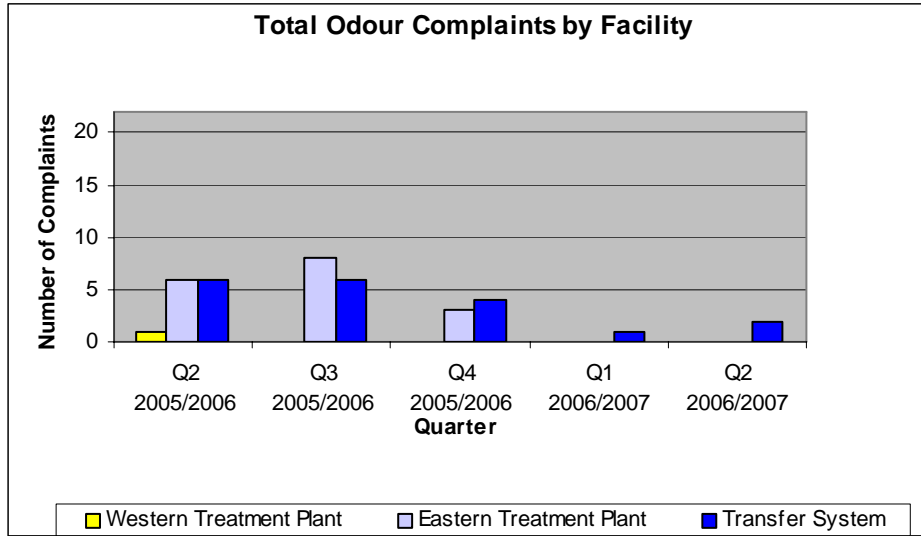


## Odour Complaints

EPA Victoria regulates odour and this requires Melbourne Water to have no offensive odour attributable to its activities. New facilities have to be designed to meet this requirement and existing facilities with odour have to establish improvement programs to achieve this in agreement with EPA Victoria. Melbourne Water has an odour management strategy to ensure that treatment plant and transfer system odour performance meets regulatory requirements. This strategy has been developed with EPA Victoria agreement. This includes targeted actions for Eastern and Western Treatment Plants and the Transfer System.

Odour performance from facilities is measured through odour complaints attributable to the facility. EPA Victoria will consider an odour complaint a discharge licence breach if it is attributable to Melbourne Water and if either the relevant improvement program is not being implemented or the program is considered unsatisfactory. Odour complaints from facilities without a discharge licence could result in a requirement to develop and implement a neighbourhood improvement plan. Should odour become a significant local issue EPA Victoria could strengthen this approach and require a review of improvement strategies or issue sanctions such as penalty infringement notices.

None of the odour complaints described below are considered to be licence breaches by EPA Victoria at this time.



### ***Eastern Treatment Plant***

There were no odour complaints received during the quarter.

### ***Western Treatment Plant***

There were no odour complaints during the quarter.

### ***Transfer System***

There were two odour complaints received during the quarter. Details are as follows:

On 30 October 2006 a member of the public reported an odour in the vicinity of Fishermans Bend. Upcoming night works planned for 30 October required the exhaust fan on the East Drop Structure located below the West Gate Bridge to be operated during the day (it normally operates during the night) to ensure condensation was kept to a minimum in the manhole. The operation of the fan during the day will be reviewed for any future works to determine if other options are available to reduce condensation in the manhole.

On 28 October 2006 a member of the public reported an odour in the vicinity of Manhole 18 on the Caulfield Intercepting Sewer in Ormond. Due to capital works at Eastern Treatment Plant that requires minimum flows at the Plant the North Road Pump Station is not operated. This leads to surcharging of the Caulfield Intercepting Sewer and it is believed this caused the odour. When the odour was reported, North Road was run to freshen up the sewage. North Road was also operated on 30 November when there was predicted hot weather to reduce the possibility of further odour issues. A standard operating procedure has been developed to run North Road twice a week and during hot weather to freshen the sewage and reduce the possibility of odour issues from the Caulfield Intercepting Sewer.

## Corporate Compliance

### Melbourne Water Passing Flow Compliance in Rivers and Streams

The table below outlines compliance with passing flow requirements at various sites. Some of these passing flows may vary due to the Yarra bulk entitlement conversion process.

#### Melbourne Water Passing Flow Compliance Quarter Two 2006/2007

Site	Passing Flow (ML/d)	Actual Min. Flow (ML/d)	Compliance	Comments
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#### RESERVOIRS:

Cardinia Res. to Cardinia Ck	5	8	✓	Melbourne Water agreement with former SR&WSC
Maroondah Res. to Watts R.	1	1	✓	Melbourne Water operating rule – 1 ML/d released via ungauged outlet pipe
O'Shannassy Res. To O'Shannassy R.	4	4	✓	Melbourne Water operating rule – 4 ML/d released via ungauged outlet pipe
Silvan Res. to Olinda Ck	2	2	✓	Melbourne Water operating rule – 2 ML/d released via ungauged outlet pipe
Tarago Res to Tarago R At Scalp Ck	5	20	✓	Melbourne Water agreement with former SR&WSC
Thomson Res. To Thomson R: Below Dam	25	105	✓	Melbourne Water Bulk Entitlement provision for Thomson Reservoir.
At Narrows	80	221	✓	
At Coopers Ck	216	229	✓	
Toorourrong Res. to Plenty R.	0.2	0.2	✓	Melbourne Water operating rule - 0.2 ML/d released for stock
Upper Yarra Res. to Yarra R: Upper Yarra Dam	10	10	✓	Melbourne Water operating rule since 1993. Based on past agreement with the SR&WSC 1999 SEPP requirement
At Millgrove	98	73*	✓	
At Yering Gorge	245	161**	✓	

#### WEIRS<sup>†</sup>:

Armstrong Ck Weir	5	5	✓	Melbourne Water operating rule
Coranderrk Ck Weir	3	3	✓	Melbourne Water operating rule – via ungauged outlet pipe
Donnelly Ck Weir	1	1	✓	Melbourne Water operating rule– via ungauged outlet pipe
Graceburn Ck Weir	3	3	✓	Melbourne Water operating rule. Reduced to 1ML/d in times of low flow and high demand from Healesville
McMahons Ck Weir	2	2	✓	Melbourne Water operating rule
Silver Ck Weir	1	0***	✓	Bulk Entitlement provision - 1 ML/d is released when streamflow is 4 ML/d or greater
Starvation Ck Weir	2	2	✓	Melbourne Water operating rule
Wallaby Ck Weir	1	1	✓	Bulk Entitlement provision - 1 ML/d is released when streamflow is 2 ML/d or greater

\* Between flows of 98 and 73 ML/d the tributaries are progressively turned out (currently McMahons and Starvation are turned out) and then 73 ML/d becomes the minimum flow. River releases have been increased at Upper Yarra, O'Shannassy and Maroondah Dams to compensate for low river flows.

\*\*Yering Gorge minimum flow to be maintained is 155 ML/d while River pumps are not in operation.

\*\*\*Dry conditions. Natural flow was below 1.0 ML/d.

### Thomson and Yarra Bulk Entitlement Watering Plans

The Thomson Catchment Bulk Entitlement for the Environment requires the West Gippsland Catchment Management Authority to develop an Annual Watering Plan detailing the release pattern for the 10,000 ML environmental water reserve held in Thomson Reservoir. Since 1 July 2006 Melbourne Water has released 4,126 ML from the environmental water reserve to meet orders placed by the Catchment Management Authority to benefit river health.

The Yarra River Bulk Entitlement for the Environment requires 17,000ML reserved in storage to meet river freshening flows. Melbourne Water is required to develop an Annual Watering Plan for the river by 26 April 2007 detailing how the environmental water reserve is to be used to benefit river health. The Minister for Water Resources and Climate Change qualified the environmental water reserve by deferring it until level 2 restrictions are lifted in Melbourne.

### Maribyrnong River Bulk Entitlement

Melbourne Water is required to manage its share of releases from Rosslynne Reservoir and water extractions from the Maribyrnong River to ensure that, as a result of diversion activities, passing flows in the river at Keilor do not fall below requirements specified in the Maribyrnong Bulk Entitlement Orders - 5 ML/day or the natural flow, whichever is the lesser. Natural flow is based on flow at Deep Creek at the Bulla gauging station.

Days when flow at Keilor was below that required		0
	<b>Compliance achieved</b>	
	<b>Compliance non achieved</b>	

## Trade Waste Agreements

Retail water company operating licences require that a company must accept any trade waste that complies with the trade waste standards. A retail company can only accept a trade waste if it does not:

- Endanger human health;
- Compromise the safety of a person or the works of any licensee; and
- Significantly adversely affect the operation of a sewage treatment plant or any part of the environment.

They may accept trade waste that does not comply with the above requirements after consultation with Melbourne Water.

A trade waste discharge that is outside the trade waste standards or an agreed variation to the standard is a non-compliant discharge and the retail water companies provide data on non-compliance to Melbourne Water every month.

The trade waste compliance requirement in retail water company licences requires quality assured systems for detecting and managing non-compliance with trade waste agreements. The three retail companies are all certified to ISO 9001 and have Sewage Quality Management Systems to meet this requirement.

Melbourne Water has established new performance targets to monitor customer performance in meeting their trade waste agreements with the retail water companies as follows:

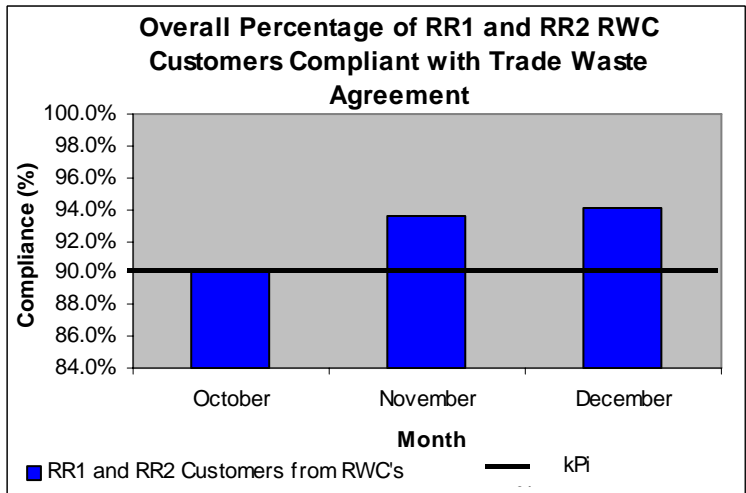
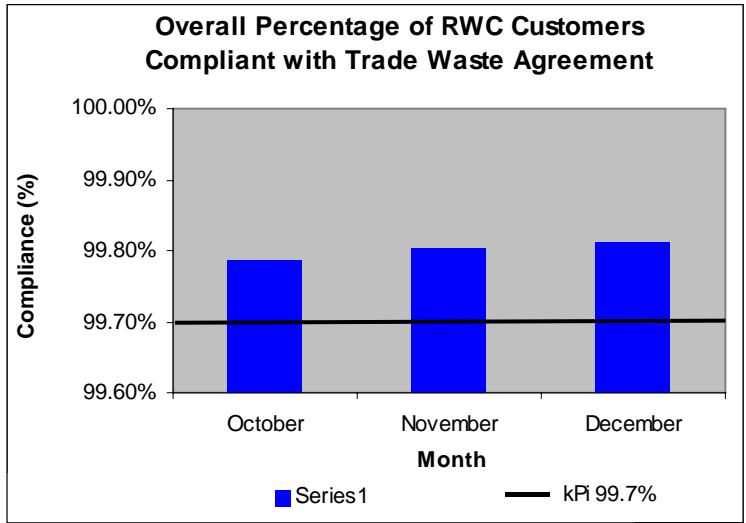
- 99.7% of trade waste customers should be compliant with their trade waste agreement
- 90% of risk rank 1 and 2 trade waste customers should be compliant with their trade waste agreement

When these targets are not met Melbourne Water will discuss the non-performance with the retail water company to see if there are any opportunities to bring the trade waste customer into compliance. Melbourne Water is discussing with the retail water companies how they can improve trade waste performance reporting so that the surveillance of high-risk customers is appropriate.

The performance targets are based on historical levels of non-compliance provided by the retail water companies and are designed to provide a baseline with which to compare future performance. The nature of Trade Waste discharges means that there will always be a background level of non-compliance, therefore a 100% target is not realistic. The performance targets provide an increased focus on the management of customer discharges by the retail water companies.

South-East Water and Yarra Valley Water include all trade waste customers, including greasy waste customers, in their report to Melbourne Water. City West Water does not include their low risk greasy waste customers in their reporting to Melbourne Water.

An explanation of the stages of the non-compliance management process for trade waste discharges is given in Appendix Four.



***RR1 and RR2 RWC customers compliant with Trade Waste Agreement***

The following table shows the data broken down by retail water companies. The KPI is to have 90 percent compliance measured and aggregated for the three retail water companies each month.

Percentage of RR1 and RR2 customers compliant	CWW	YVW	SEW
October	85.42	89.19	96.08
November	85.42	97.30	98.04
December	87.50	94.59	100

The above comparison shows the percentage of RR1 and RR2 customers that are compliant with the agreements each month. The cause of the non-compliance is not considered in this KPI and it therefore does not necessarily relate to potential risk for Melbourne Water. For example a non-compliance with a treatable parameter such as nitrogen is not as large a risk as non-compliance with an explosive or non-treatable toxicant. The differences in KPI performance can also be related to the level of monitoring conducted by the retail water company. This is not consistent across the retail water companies.

Melbourne Water will be working with the retail water companies to develop a more sensitive KPI that better reflects risk to Melbourne Water and that encourages a more appropriate measure of performance.

## Water Recycling at Western and Eastern Treatment Plants

Waste minimisation, through effluent and biosolids reuse and by other means, is a licence objective for both Eastern Treatment Plant and Western Treatment Plant. Melbourne Water has established a target to recycle on average 20 % of effluent by 2010.

### *Eastern Treatment Plant*

During the quarter approximately 1,018 ML of recycled water was supplied to customers along the South East Outfall and 3,667 ML was supplied to the Eastern Irrigation Scheme. In addition to this approximately 6,474 ML of water was used onsite at the Eastern Treatment Plant.

The Eastern Irrigation Scheme now provides “Class A” recycled water from their new plant off Thompson Road supplying quality recycled water to the Sandhurst Club, Wedge Rd Reserve and other customers in the Cranbourne and Five Ways districts.

### *Western Treatment Plant*

During the quarter approximately 4,751 ML of recycled water was supplied to Southern Rural Water for the Werribee Irrigation District, and 116 ML was supplied to the Werribee Tourist Precinct, incorporating both the Werribee Park Golf Club and the State Equestrian Centre. In addition to this, approximately 14,589 ML of recycled water was used onsite at the Western Treatment Plant.

The new chlorination and UV disinfection plant is supplying Class A recycled water to both the Werribee Tourist Precinct customers and the Werribee Irrigation District.

### *Influent Total Dissolved Solid Limit*

To ensure that flows into Western Treatment Plant do not have total dissolved solids levels that would compromise effluent reuse opportunities, the revised discharge licence from EPA Victoria has a future influent limit of median total dissolved solids to not exceed 1000 mg/L by 2009. This section will report on compliance with the current compliance limit of 1250 mg/L.

Influent limit of 1250 mg/L total dissolved solids			
Compliance	Not Achieved	Achieved	

## **Biosolids Reuse at Western and Eastern Treatment Plant**

Melbourne Water has developed a biosolids management strategy that includes targets to beneficially use 100% of annual production at Eastern Treatment Plant by 2005 and Western Treatment Plant by 2010.

EPA Victoria approved the Eastern and Western Treatment Plant biosolids management plans in January 2004. These plans describe biosolids inventories, address quality and quantity issues, beneficial use options and set relevant Melbourne Water operational targets.

The Board noted the 2006 Biosolids Beneficial Use Strategy in July 2006. The Strategy outlined actions to achieve the use of clay-rich biosolids stored onsite at the Eastern Treatment Plant as structural fill in roads in the short to medium term. The strategy also outlines plans for further investigations into the potential use of Eastern Treatment Plant biosolids for land application in the longer term, subject to clarification of potential risks and liabilities. In addition, a research program for identifying future innovative options for beneficial use of biosolids from both the Eastern and Western Treatment Plants will be implemented. At Western Treatment Plant, the strategy recommends developing a business case for the potential use of biosolids as a fuel at the Blue Circle Southern Cement facility at Geelong.

### ***Eastern Treatment Plant***

During the quarter there were no biosolids removed from the Eastern Treatment Plant for beneficial use.

Due to the high clay content of the Eastern Treatment Plant stockpiled biosolids, Melbourne Water is pursuing the use of biosolids as road embankment fill in the Vic Roads Deer Park bypass project. Melbourne Water has received confirmation from EPA Victoria that the project is consistent with regulatory obligations and is working with EPA Victoria to develop guidelines for using biosolids in this application. Developing these guidelines would allow biosolids structural fill projects like this to proceed under an approved Environment Improvement Plan.

### ***Western Treatment Plant***

During the quarter no biosolids were removed from the Western Treatment Plant for beneficial use.

Due to the high contaminant levels and potentially useful calorific value of the Western Treatment Plant biosolids, Melbourne Water completed a feasibility study into energy recovery. The study investigated both onsite and offsite energy recovery alternatives and found that use of biosolids as a fuel at Blue Circle Southern Cement was the preferred option.

During the quarter a Memorandum of Understanding was completed between Melbourne Water and Blue Circle Southern Cement to describe arrangements for a joint feasibility study into using biosolids as a renewable fuel at their facility. This study has commenced and will be followed with a business case should the project prove to be technically and commercially viable.

*Status Report - Meeting SEPP Targets for Melbourne's Waterways*

The following information describes the physico-chemical and bacteriological condition of Melbourne's waterways during the reporting period. Objectives set out in the three relevant State environment protection policies (SEPPs) are the long-term targets for water quality. There is no specific statutory obligation on Melbourne Water to meet these targets.

The Waters of Victoria SEPP has a provision for the development of interim waterway water quality objectives if there is little chance of attaining the desired quality within the ten-year time frame of the SEPP. Melbourne Water will be developing interim objectives where relevant as part of the Regional River Health Strategy. Melbourne Water has adopted a long-term target to achieve good waterway health in all natural waterways by 2025.

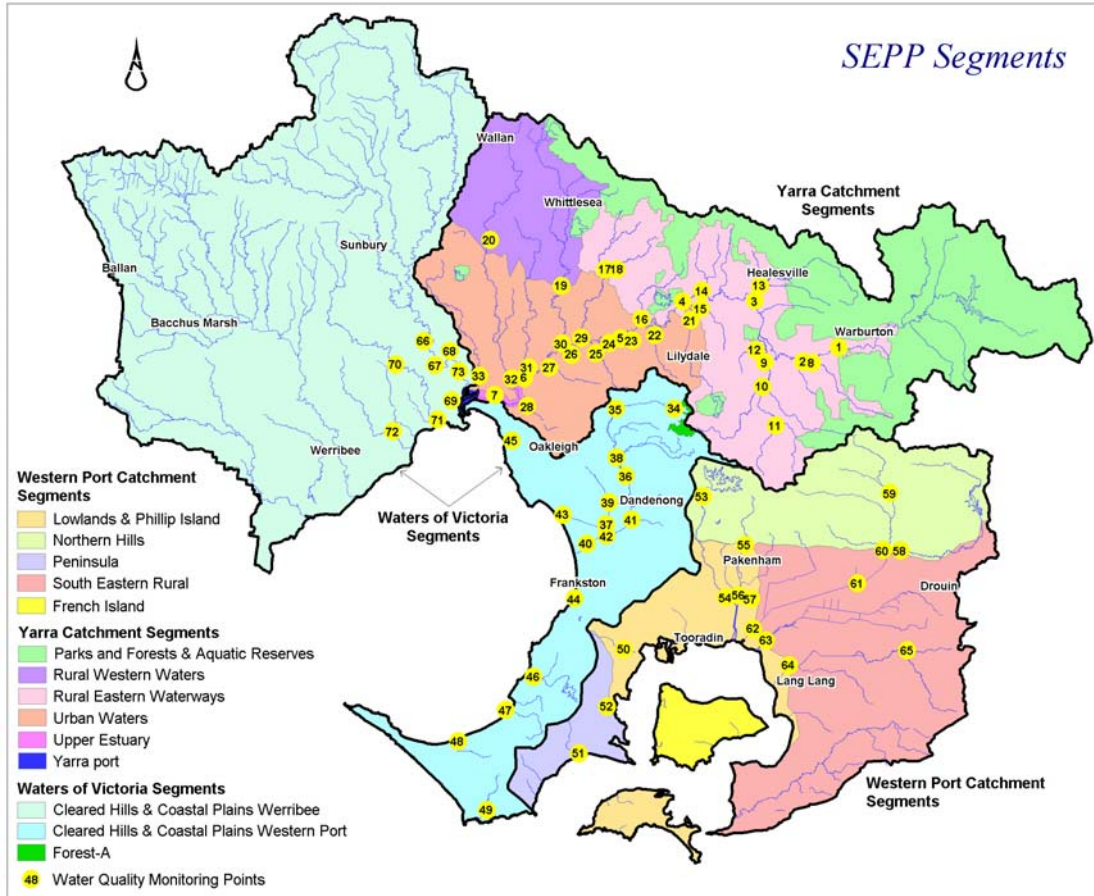
This quarterly report uses a rolling twelve months of waterway water quality data and applies 25th, 50th and 75th percentiles to the data, as well as minimums, maximums and geometric means, dependant on the particular SEPP schedule and segment a waterway falls within. A revised map has been prepared to show SEPP segments and where monitoring points are located. The performance tables show performance against relevant SEPP objectives. The coloured row shows how many sites in the segment met the relevant objective. SEPP compliance calculations require eleven samples for most parameters. For a small number of sites in this report, a reduced number of data were available due to drought or access conditions.

New monitoring sites will be added in the extended area and as data becomes available this will be included in the tables.

Waterway monitoring data from the last twelve months showed that waterways within Greater Melbourne performed well for parameters such as pH and poorly for nutrients, dissolved oxygen and electrical conductivity. Results were mixed for turbidity and *E.coli*.

## Waterway Water Quality Quarter Two, 2006/2007

The table below shows the environmental quality of Greater Melbourne's waterways during the reporting period, sorted by catchment. Results indicate the percentage of samples taken in each catchment that comply with State water quality guidelines.



### SEPP - Waters of the Yarra Catchment

Segment	Sites	DO min	EC	pH min	pH max	Turb 50%	T-P max	T-N max	<i>E. coli</i> geo**
		% sat		pH units	pH units	NTU	mg/l	mg/l	org/100ml
Rural Eastern Waters		80	NA	6	8.5	15	0.05	0.6	200
	15	0		14	15	11	4	0	11
Rural Western Waters		60	NA	6	8.5	25	0.05	0.6	200
	2	0		2	2	2	0	0	2
Upper Estuary		60	NA	6.5	8.5	30	NA	NA	200
	1	1		1	0	1			0
Urban Waters		60	NA	6	8.5	30	0.08	0.9	200
	15	6		14	11	13	2	0	1

## SEPP - Waters of Victoria

Segment	Sites	DO 25%ile	EC 75%ile	pH 25%ile	pH 75%ile	Turb 75%ile	T-P 75%ile	T-N 75%ile	<i>E.coli</i> 50%ile*
		% sat	uS/cm	pH units	pH units	NTU	mg/l	mg/l	org/100ml
Cleared Hills & Coastal Plains - Werribee / Maribyrnong		85	1500	6.5	8.3	10	0.045	0.6	150
	8	0	2	8	8	3	2	2	6
Cleared Hills & Coastal Plains - Western Port		85	500	6.4	7.7	10	0.045	0.6	150
	15	1	1	15	11	4	2	2	4
Forest-A		90	100	6.4	7.7	5	0.025	0.5	150
	1	0	0	1	1	0	1	0	1

## SEPP - Waters of the Western Port Bay and Catchment

Segment	Sites	DO min	EC	pH min	pH max	Turb 50%ile	T-P max	T-N max	<i>E.coli</i> geo**
		% sat		pH units	pH units	NTU	mg/l	mg/l	org/100ml
Lowlands & Phillip Island		80	NA	6.5	9	15	0.05	0.6	200
	7	0		6	7	2	1	0	4
Northern Hills		85	NA	6.5	9	5	0.03	0.2	200
	5	0		5	5	0	0	0	3
Peninsula		80	NA	6.5	9	15	0.05	0.6	200
	1	0		0	1	1	0	0	0
South Eastern Rural		80	NA	6.5	9	15	0.05	0.6	200
	3	0		3	3	2	1	0	0

## Colour Legend

Sites	Number of Sites passing SEPP			
Number of sites in segment	no passes	less than half passed	more than half passed	all pass

## Definitions

<b>DO</b>	dissolved oxygen
<b>EC</b>	electrical conductivity
<b>Turb</b>	turbidity
<b>T-P</b>	total phosphorus
<b>T-N</b>	total nitrogen
<b>min</b>	minimum
<b>max</b>	maximum
<b>...%tile</b>	..th percentile
<b>geo</b>	geometric mean
*	This SEPP requires 5 samples at regular intervals within 30 days, however these figures have been calculated using 12 monthly readings
**	This SEPP requires a 42 day geometric mean, however these figures have been calculated using 12 monthly readings.
<b>%sat</b>	percentage saturation
<b>uS/cm</b>	micro Seimen per centimetre
<b>NTU</b>	nephelometric turbidity units
<b>mg/l</b>	milligrams per litre
<b>org/100ml</b>	organisms per 100 millimetres
<b>NA</b>	none applicable

## Reporting Alert Levels for Waterway Water Quality

Water quality alert levels were agreed between EPA Victoria and Melbourne Water in 1994. Alert levels are generally well above water quality objectives specified in relevant State Environment Protection Policies, representing instances of particularly undesirable water quality. Melbourne Water is required to report all alert-level exceedances that occur within our jurisdiction to provide a means of identifying sites that often experience poor water quality and also to provide a mechanism for locating and mitigating chronic pollution problems.

From October to December 2006, a total of 102 alert-level exceedances were reported to EPA Victoria, or about 2.3 % of the total number of water quality measurements.

This compares with 88 exceedances reported in the second quarter last year. Exceedances were most commonly reported for oxygen saturation, conductivity and total nitrogen. There were four sites with seven or more exceedances, Watsons Creek at Dandenong- Hastings Rd, Somerville (9 due to nutrients and conductivity), Brushy Creek at Lower Homestead Road Bridge, Wonga Park (8 due to nutrients and suspended solids), Mordialloc Creek at Wells Rd (7 due to conductivity and metals) and Patterson River at the National Water Sports Centre (7 due to conductivity, nutrients and metals).

- In Watson's Creek, the high level of nutrients is believed to be associated with market garden runoff
- In Brushy Creek, the high nutrients levels are likely to be mostly associated with upstream sewage treatment plant discharge
- In Mordialloc Creek and Patterson River, elevated metal and nutrient levels are believed to be associated with urban/industrial runoff

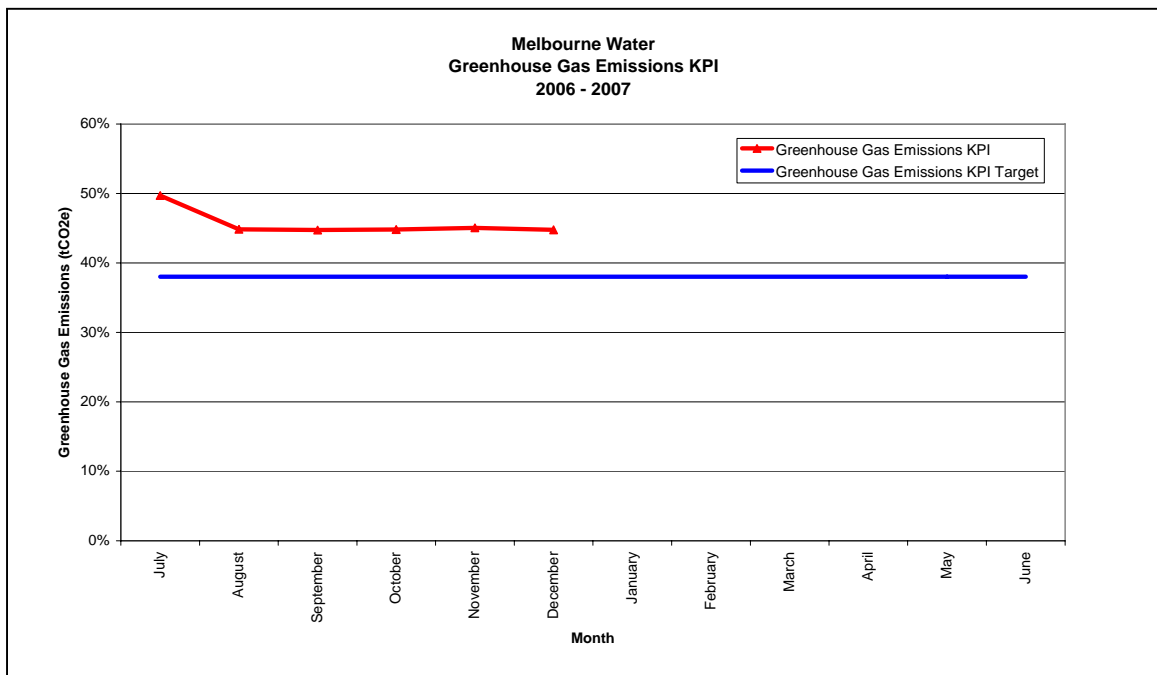
## Renewable Energy and Greenhouse Gas Emissions Performance

Melbourne Water has established Key Performance Indicators for increased renewable energy and reduced greenhouse gas emissions. While there are no strict regulatory requirements for these, there are increasing soft regulatory requirements such as EPA Victoria’s discharge licence requirement to implement energy efficiency projects with pay back periods of three years or less. The Commonwealth Government is also introducing similar requirements for businesses that use more than 0.5 PJ of energy each year and Melbourne Water uses about 2 PJ.

The following graphs show performance against the two Key Performance Indicators. The definition for each is included with each graph. For information two additional charts are included showing the energy content of sewage and water and the fuel efficiency of Melbourne Water’s vehicle fleet.

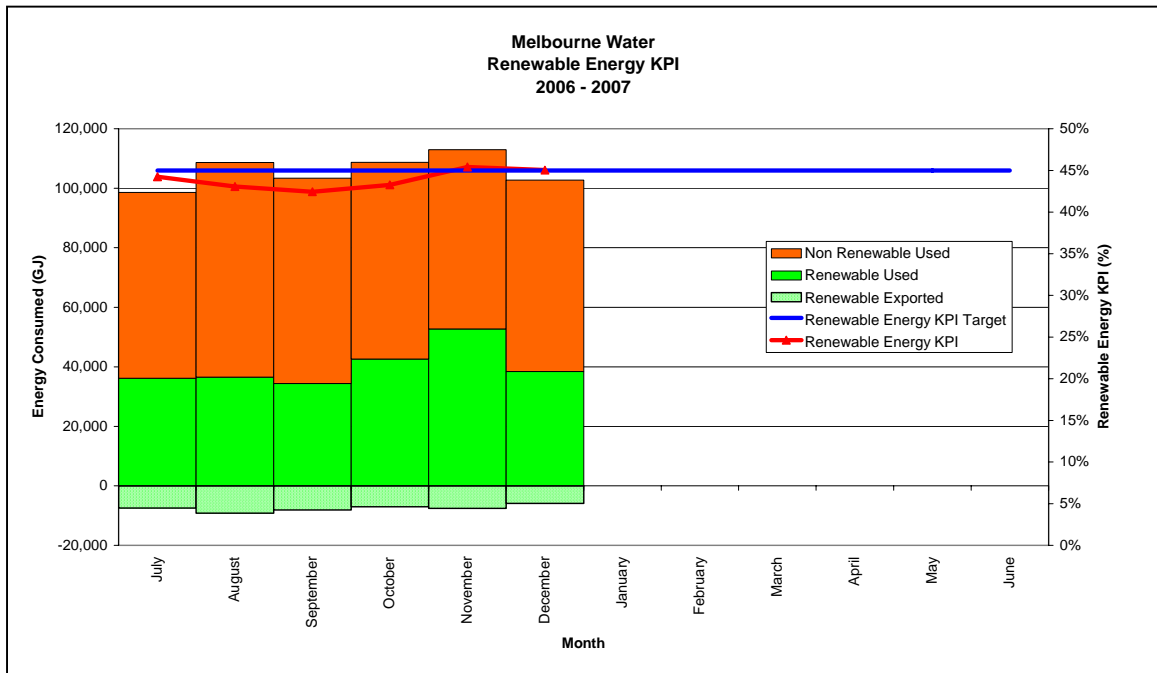
### Greenhouse Emissions KPI

$$= (\text{Total Emissions 2000/01} - \text{Total Emissions 2005/06}) / \text{Total Emissions 2000/01}$$



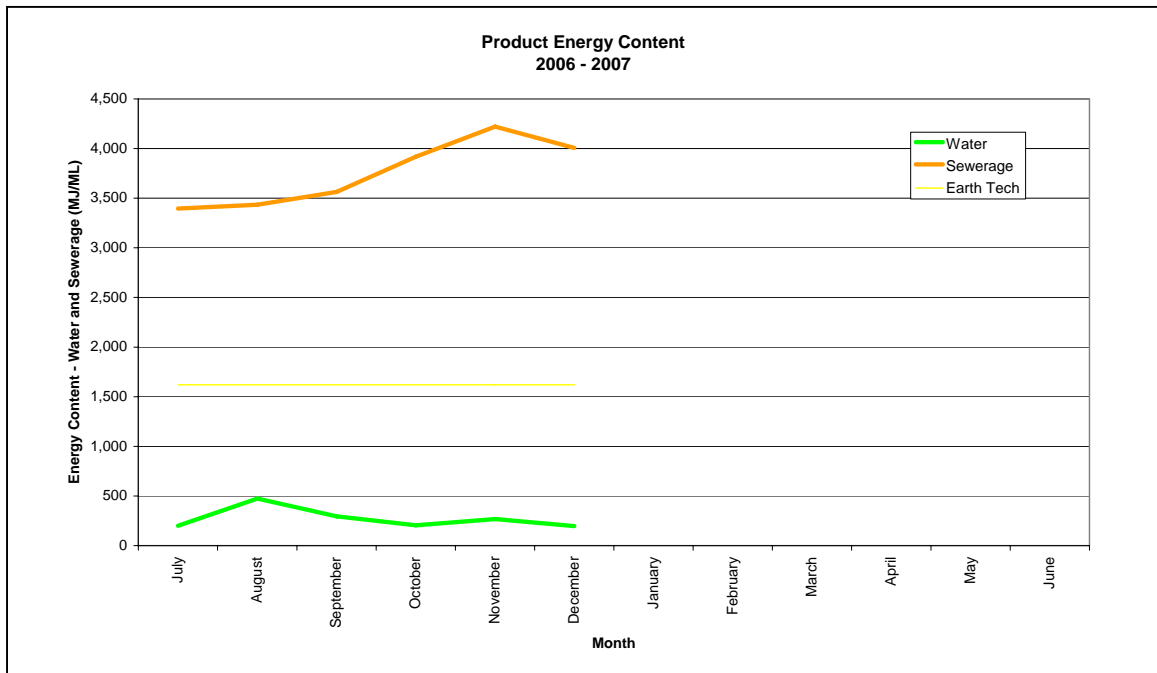
**Renewable Energy KPI**

$$= \text{Renewable Energy Produced or Used} / \text{Total Energy used by Melbourne Water}$$



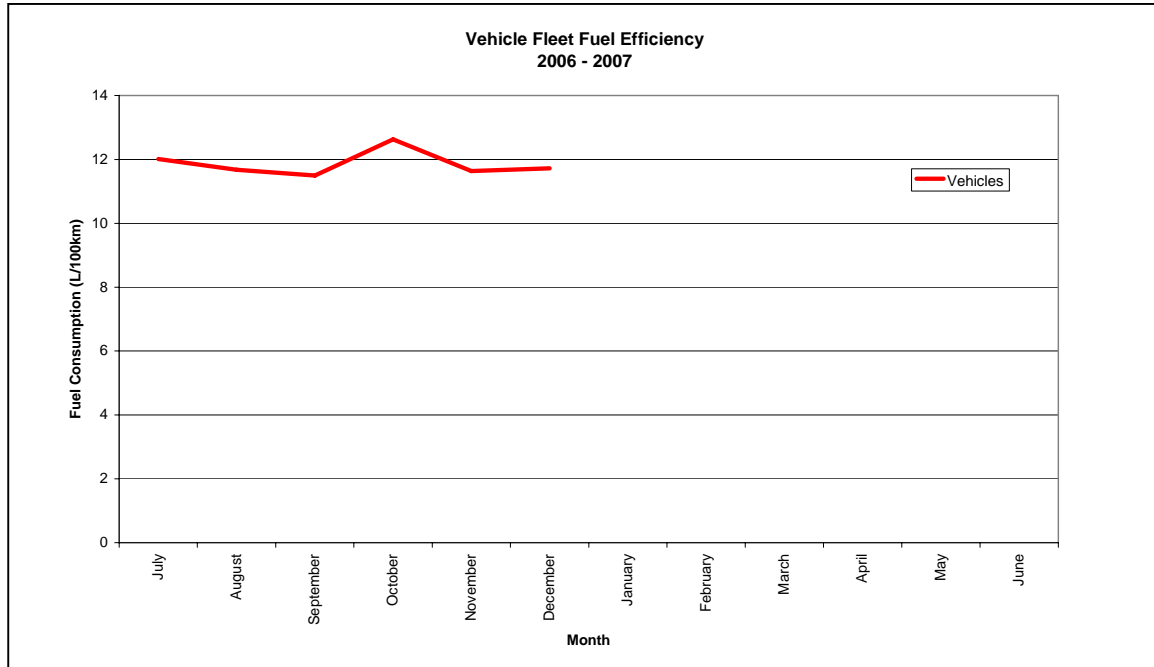
**Energy content**

Energy content is how much energy Melbourne Water or Earth Tech (TopAq Water) uses to produce a ML of product. Earth Tech’s line is the average energy required per ML of Class A water from ETP effluent.



### *Vehicle fleet efficiency*

On average how much fuel is used to travel 100 kms.



## Catchment Profile

### *Swamp Skink distribution and ecology in the Port Phillip and Western Port region*

Melbourne Water recently commissioned a review of the distribution and ecology of the Swamp Skink (*Egernia coventryi*) which is listed as threatened under the Victorian *Flora and Fauna Guarantee Act 1988*.



The Swamp Skink (*Egernia coventryi*), specimen from Chinamans Creek, West Rosebud.

The review included the production of swamp skink distribution maps and a detailed description of its ecological requirements, including areas where the species is likely to occur based on the presence of preferred habitat.

Within its known range, the Swamp Skink is distributed patchily, and has specialised habitat requirements. The most noticeable of these requirements is that the species is restricted to densely vegetated freshwater swamps and watercourses, wet heaths, sedgeland (often sedge-rich, low-lying marshes or drainage lines) or saltmarshes. Swamp Skinks appear to select micro-habitats that have very dense vegetation structure from ground level to a height of approximately two metres or less, with sparse or no overstorey.

Numerous threatening processes have been implicated in the decline of Swamp Skinks and their habitat but the most important of these is loss, degradation and fragmentation of habitat. Other threats include predation from exotic predators and stock grazing that can reduce ground-level vegetation cover or complexity.

Some specific management principles for Swamp Skink conservation include:

- keeping exotic predators (foxes, dogs, cats, rats etc.) out of Swamp Skink habitats
- excluding domestic grazing herbivores such as cattle from Swamp Skink habitats
- maintaining revegetated areas, in particular minimizing tree and shrub canopy, which block sunlight to understorey vegetation

Melbourne Water has now commissioned further swamp skink surveys, concentrating in areas where they are likely to occur and where Drainage Schemes for new urban developments are proposed. Many of these additional surveys are within Melbourne Water's extended area.

A revised distribution map resulting from this work will be important in planning waterway protection and improvement activities targeted at conserving this threatened species.

## Appendices

### Appendix One: Guide to Terms

Parameter	Units	Explanation
<b>BOD</b> <i>Biochemical Oxygen Demand</i>	mg/L*	A measure of the oxygen depleting potential of waste - usually measured over a five day period.
<b>CBOD</b> <i>Carbonaceous Biochemical Oxygen Demand</i>	mg/L*	A measure of the oxygen depleting potential of the carbonaceous (organic) portion of the waste - usually measured over a five day period.
<b>SS</b> <i>Suspended Solids</i>	mg/L*	A gravimetric measure of undissolved matter, when retained on filter.
<b>Amm</b> <i>Ammonia</i>	mg/L*	A form of nitrogen, present in untreated sewage and many industrial wastes. Is toxic to certain fish and marine species.
<b>Surf</b> <i>Anionic Surfactants</i>	mg/L*	Surface active agents, associated with detergents
<b>pH</b>	numeric	A measure of the acidity (pH 0-7) or alkalinity (pH 7-14) of sample. Pure water is slightly acidic, due to dissolved carbon dioxide.
<b>TRC</b> <i>Total Residual Chlorine</i>	mg/L*	A measure of the remaining chlorine associated with the disinfection of effluent.
<b>D.O.</b> <i>Dissolved Oxygen</i>	mg/L*	An indication of "waterway health". Levels may deviate from saturation by pollutant depletion, or supersaturation due to algal activity.
<b>Metals</b>	mg/L* or µg/L#	Are an indication of contamination. Metals tested include lead, cadmium, chromium, copper, zinc, nickel and mercury.
<b>E. coli</b> <i>Escherichia coli</i>	no. of organism s/ 100ml	A common bacteria from the intestines of warm blooded animals. Used as an indicator of faecal contamination.
<b>PAH's</b> <i>Polynuclear Aromatic Hydrocarbons</i>	µg/L#	Polynuclear Aromatic Hydrocarbons are by-products of petro-chemical industries and combustion processes. Many PAH's are highly carcinogenic.
<b>Total P or TP</b> <i>Total Phosphorus</i>	mg/L*	Measured as phosphate after acid digestion of total sample to convert all combinations of phosphorus to phosphate.
<b>Phenols</b>	µg/L#	Phenols are widely used in resins, disinfectants and industrial products. Trace residuals are resistant to decomposition.
<b>Total N or TN</b> <b>Total Nitrogen</b>	mg/L*	The total amount of nitrogen comprising organic nitrogen, ammonia, nitrate and nitrite
<b>Turb</b> <b>Turbidity</b>	NTU	Cloudiness caused by materials suspended in water
<b>EC</b> <b>Electrical conductivity</b>	µS/cm	A measure of the ability to conduct an electrical current and used as an indicator of salinity
<b>Org N</b> <i>Organic Nitrogen</i>	mg/L*	A distinction between the inorganic nitrogen forms (ammonia, nitrite and nitrate), and the organic compounds present in food/body wastes. (proteins, amines)

\* milligrams per litre of water sampled - is equivalent to parts per million

# usually expressed as micrograms per litre of water sampled - is equivalent to parts per billion

## **Appendix Two: Details of the Environmental Impact Rating of Sewer Spillages**

The development of an environmental impact rating for sewer spills includes the following factors:

- environmental quality of the receiving water;
- spill content;
- dilution of effluent in receiving water; and
- the volume of the spill.

The impact rating is based on a procedure that considers the various combinations of grade for each of the factors together and then groups them into an impact rating based on a simple model. Each possible combination of grades has been put into one of the ratings from one to five. Although this may appear to be an arbitrary process, the results represent a reasonable estimation of the potential environmental impact of a spill from a sewer.

The environmental impact rating is an indication of the potential impact of spill events, not a measure of actual impact.

### Examples

An example of a significant spill achieving an impact rating of “5” occurred during Period 12 1994/95. ERS number 327 discharged 10 826 Kl of untreated sewage into the Maribyrnong River. The volume of this spill was the key determinant in the spill classification of “5”.

ERS number 327 discharged on another occasion during Period 12 1994/95 resulting in 68 Kl of sewage being discharged into the Maribyrnong River. This spill was given a rating of “2” due to the relatively minor volume of sewage discharged into the waterway and was not regarded as significant.

## **Appendix Three: Melbourne Water Spillage Reporting**

How Melbourne Water reports sewerage system spills within Melbourne Water and to EPA Victoria is described below.

All spills, regardless of volume or content, are reported internally or to an external authority. The significance of the spill determines the reporting process.

### Spills where there may be an environmental or public health hazard\*

1. Immediately by phone or fax using the EPA NOTIFICATION OF SEWER SPILL form by a senior manager to EPA Victoria.
2. These spills require a SEWER SPILL NOTIFICATION FOLLOW-UP report to EPA Victoria within 21 days of the spill.
3. Subsequent written reports are provided to Melbourne Water executives (as required) and EPA Victoria (quarterly).

Where there is potential for a public health impact DHS is also notified.

### All Spills (including spills of low significance)

1. Each period, a summary of all spills is included in the Business Unit's Operating Report to Board.
2. The Quarterly Board Environmental Compliance Report provides more details on all spills.
3. A Quarterly Spills Report summary of spills is forwarded to EPA Victoria.

\*Hazards that require immediate follow up include where there is a:

- public health concern
- sensitive receiving environment
- large industrial or commercial waste component
- sewer spill very visible in a public area
- potential for media involvement
- sewer pipe 300mm diameter or greater
- flow >80L/min (ie: two house taps going flat out for approx hour = 5 KL)

## **Appendix Four: Description of the Phases of Trade Waste Agreement Restrictions**

The retail water companies use a risk-ranking model as one of the tools used to manage trade waste discharged to sewer. The risk-ranking model has been developed over many years and takes into account key aspects of each customer's circumstances.

These include:

- Location of the discharge in relation to the receiving sewage treatment plant;
- Volume of trade waste discharged to sewer;
- Compliance history of the customer;
- Activities undertaken on the customer's site which generate trade waste; and
- Substances in the trade waste.

The risk-ranking model calculates a risk weighting for each customer and from this customers are allocated to one of five risk categories, with a risk ranking of 1 being the highest risk and 5 being the lowest. The risk rating determines the level of monitoring required for a company.

Retail water companies initiate a three-step management process when a customer does not comply with the conditions of their Trade Waste Agreement or Consent.

Stage 1:

When a non-compliant sample is identified, an Initial Trade Waste Notice is issued. The Notice specifies how the trade waste fails to comply and requires the customer to remedy the problem, provide written documentation explaining reasons for the non-compliance and the steps taken to ensure it will not happen again.

Stage 2:

If further samples of trade waste do not comply after the date specified in the Notice a letter is issued requiring the customer to:

- review its waste treatment processes;
- attend a meeting to discuss the cause of the non-compliance and processes to prevent a recurrence; and
- meet costs in ensuring trade waste complies with the Agreement.

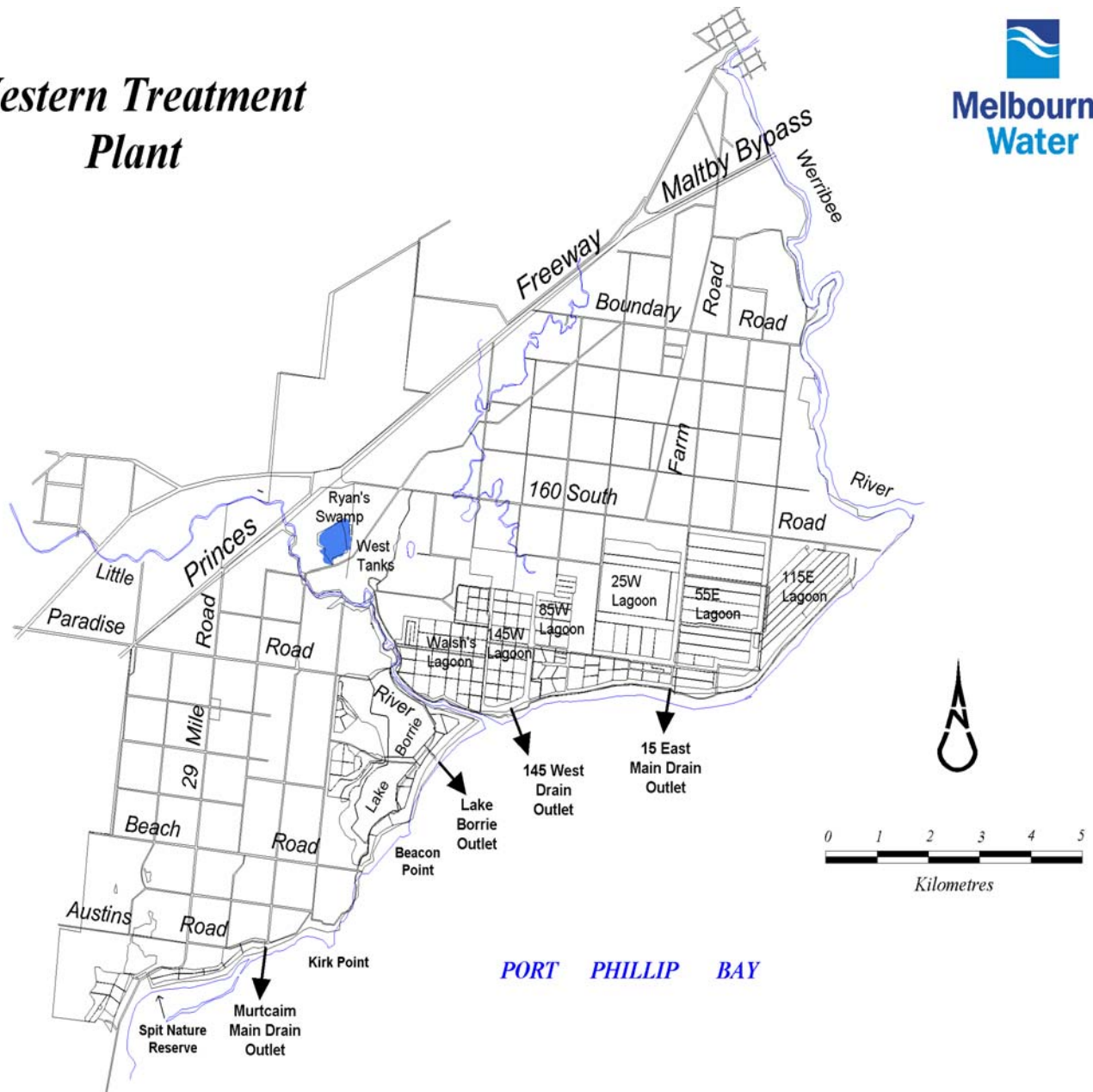
Stage 3:

Samples of trade waste will continue to be taken and analysed and no further action will be taken if the trade waste becomes compliant. However if a sample does not comply a Notice of Breach will be issued setting out a date by which the trade waste must comply with the Agreement.

If the trade waste does not comply by the set date the customer must cease discharging trade waste to the sewer immediately, the trade waste connection point will be sealed and the media may be informed. Any further discharge of waste will be liable to a fine of up to \$20,000 and up to \$8000 for each day during which waste is discharged. Before any further trade waste can be discharged, a new Agreement must be negotiated and the customer must prove it will achieve on-going compliance.

# Appendix Five: Map of Western Treatment Plant Discharge Points

## Western Treatment Plant



## **Appendix Six: Environment Protection Authority (EPA) Enforcement Policy**

The Environment Protection Act (1970) establishes the Environment Protection Authority to provide for a system of administration to ensure a high standard of environmental quality. The Act allows for a range of regulatory and non-regulatory activities including implementation of State environment protection policies, environmental monitoring and community education programs.

### **EPA Investigations**

After an incident has been reported to the EPA, authorised officers from the EPA have the power under the Environmental Protection Act (1970) to embark upon an investigation. The investigation may involve:

- entry to the premises to take samples, photographs, tests, etc
- requesting information such as files, maps and or other documents relating to the incident
- identifying the occupier of the premises
- ordering clean-up procedures
- conducting formal interviews with management or individuals associated with the incident

### **Enforcement Measures**

After investigation of a particular incident by the EPA the following enforcement measures are available under the Environment Protection Act (1970):

- warnings
- directions by an authorised officer
- notices
- infringement notices
- prosecutions
- licence suspension or revocation
- injunctions

### **Mounting a Prosecution - What is considered**

In brief, the following factors are taken into account when deciding upon the most appropriate enforcement measures following an incident:

- the seriousness of the offence and harm to the environment
- previous history of offences
- the prevalence of the offence in the eyes of the public
- enforcement costs for the EPA
- the precedent which may be set by not taking enforcement action
- the cooperation of the alleged offending individual or company.

## **Melbourne Water and EPA Victoria**

Melbourne Water could be subject to formal investigation by EPA Victoria in relation to incidents such as the 1992 Epsom Road Sewer Collapse and subsequent unlicensed discharge into the Maribyrnong River.

Melbourne Water has maintains a long-term cooperative relationship with EPA Victoria, including Quarterly Liaison Meetings of senior managers. This working relationship has resulted in open and honest communication so that the interaction between Melbourne Water's environmental performance and EPA Victoria's expectations holds no surprises.

Every incident such as the overflow of untreated sewage from an Emergency Relief Structure into a waterway could be regarded as an unlicensed discharge and an offence under the Environment Protection Act (1970). Where such incidents lead to unclear regulatory requirements steps are taken so that a clear position is developed. For example EPA Victoria has clarified that releases from the sewerage system through Emergency Relief Structures are compliant if they occur during rainfall events in excess of 1 in 5 years.

## **Appendix Seven: Emergency Response Procedures in Melbourne Water**

A critical element of Melbourne Water's risk management process is ensuring the Corporation is prepared for and can effectively respond to and recover from incidents with potential to have an impact on our stakeholders, customers, the broader community or the environment.

Melbourne Water has established PERFORM (Prompt Emergency Response for Melbourne), which outlines the responsibility all Melbourne Water people have in incident management and details how we will respond to an incident in an integrated manner. The program highlights the need for thorough planning, preparation and training as a means of ensuring the effective and efficient management of any incident.

PERFORM is more than an incident management program, it is a comprehensive risk management program which incorporates prevention, preparedness, response and recovery for any adverse incident which could affect Melbourne Water.

The aims of PERFORM are to:

- Prevent or reduce the risks of incidents occurring in Melbourne Water
- Prevent or reduce the impact and consequences of incidents on customers, local community, stakeholders, environment, service delivery, system assets and operations
- Promote and support the maintenance and control of effective incident and emergency management processes

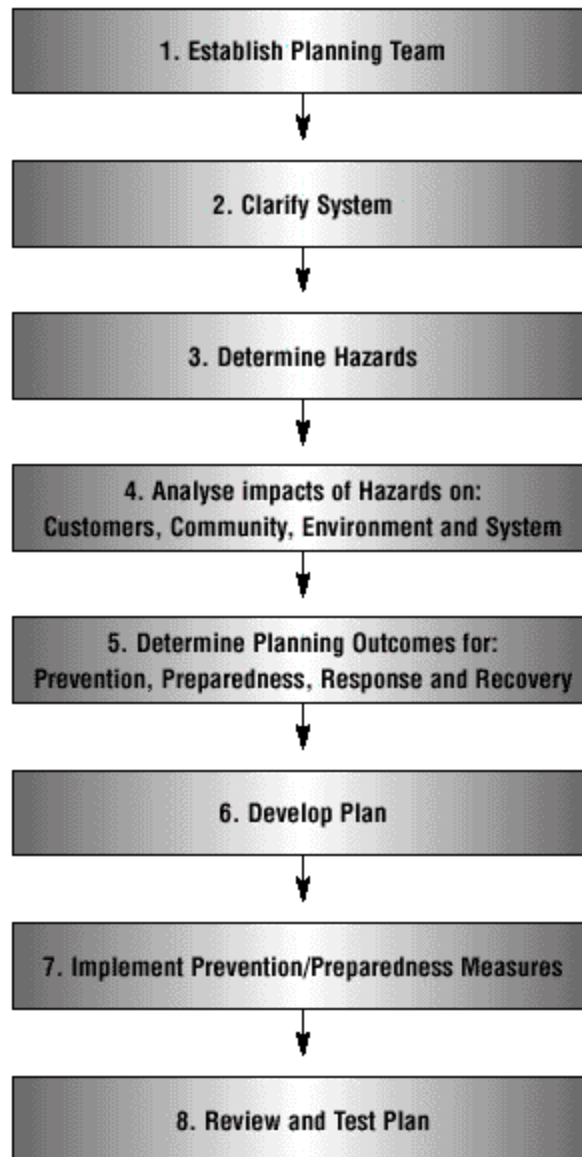
An *Incident* is any event or circumstance within our, or our customers operations that causes or is likely to cause:

- An interruption of service to customers
- A threat to our systems
- A threat to community health and safety
- A threat to the environment
- A threat to private or public property.
- The creation of the need for urgent action under statute or legislation

PERFORM incidents are categorised into five types. The following table defines the incident types and provides some examples of each type:

<b>Category</b>	<b>Definition</b>	<b>Examples</b>
<b>Near Miss</b>	A Near Miss is an unintended event that, but for the intervention of a risk control measure or human intervention, is likely to have resulted in a minor, significant or major incident, or in an emergency.	<ul style="list-style-type: none"> <li>• Detection of a chlorine release of greater than two ppm, but less than 10 ppm at Winneke water treatment plant</li> <li>• Lost bush walkers in catchment area</li> </ul>
<b>Minor</b>	A Minor Incident is one where local work teams, under normal supervision, can effectively cope with little or no adverse effects on the Corporation, its customers and the community. <b>Note: If the media become involved, a Minor Incident becomes a Major Incident.</b>	<ul style="list-style-type: none"> <li>• Minor motor vehicle accident</li> <li>• Short duration computer system malfunction</li> <li>• Minor flooding</li> <li>• Vandalism in catchment area</li> <li>• Employee or contractor/visitor injury</li> <li>• Intentional access to catchment area</li> </ul>
<b>Significant</b>	A Significant Incident is one that can be managed at the site level but: <ul style="list-style-type: none"> <li>• May need external resourcing over and above that which is usually used by the work team; and/or</li> <li>• The actual or potential impact on the Corporation, its customers, the community and the environment is more widespread.</li> </ul> <b>Note: If the media become involved, a Significant Incident becomes a Major Incident.</b>	<ul style="list-style-type: none"> <li>• Burst main causing some property damage</li> <li>• General sewer stoppage with contained spill</li> <li>• Moderate flooding</li> <li>• Prolonged SCADA outage</li> <li>• Minor industrial actions</li> <li>• Asset or system failure causing property damage</li> <li>• Intentional damage to catchment area</li> </ul>
<b>Major</b>	A Major Incident is one which requires off-site co-ordination with major levels of external resourcing and support; and/or causes or has the potential to cause major impact on the Corporation, its customers, the community and the environment. <b>Note: All incidents which involve the media are to be considered as Major Incidents</b>	<ul style="list-style-type: none"> <li>• Burst main in a large shopping centre</li> <li>• General sewer stoppage resulting in an uncontained spill</li> <li>• Major or widespread flooding</li> <li>• Bushfire in water supply catchments (natural or intentional)</li> <li>• Dam failure</li> <li>• Major industrial action</li> <li>• Asset or system failure causing major property damage</li> </ul>
<b>Emergency</b>	An Emergency is an event which significantly impacts Melbourne Water's ability to continue its operations. It will affect Melbourne Water's: <ul style="list-style-type: none"> <li>• Operability (acceptable level of service)</li> <li>• Image or reputation (community, media, political)</li> <li>• Liability (legal, financial)</li> </ul>	<ul style="list-style-type: none"> <li>• Any of the above major incidents</li> <li>• Fatality or multiple injuries</li> <li>• Loss of stakeholder support</li> <li>• Corporate governance/compliance issue</li> <li>• Occurrence of any of the five key metropolitan water industry threats</li> </ul>

PERFORM does not only involve cleaning up after an incident. It also involves planning, training, procedure documentation and test planning. The incident management planning process is described below;



PERFORM applies to all Melbourne Water operations and business areas. Each group has generic plans to cover routine system faults for the different water supply, wastewater and drainage operations or for any other activity that has potential to have an impact on Melbourne Water's business, its customers or the community.

A contingency plan is a series of processes or procedures to prevent, prepare for, and respond to and recover from events that can be foreseen to occur that can affect our operations or service delivery. It identifies any potential problem areas, and provides options for containing and controlling such events.

Each manager is responsible for determining the probability and consequences of failure of assets, systems and work practices, as well as for preparing contingency plans to deal with any failure.