

# essentialfacts

## The Sewerage System

Melbourne produces about 925 million litres of sewage a day. Of this, about 130 million litres is produced between 8am and 10am.

Sewage is transported from homes and businesses to Melbourne's treatment plants via pipes and pumping stations. Commercial and industrial waste, called trade waste, is also discharged under licence into the sewerage system. It can take up to 12 hours for sewage and trade waste to reach the treatment plants.

About 92% of Melbourne's sewage is treated at two treatment plants: the Western Treatment Plant in Werribee (right) treats about 52%, or 485 million litres a day, and the Eastern Treatment Plant in Bangholme treats about 40%, or 370 million litres a day. The remaining sewage is treated by local treatment plants, which are owned and operated by the retail water companies.



Melbourne Water owns and operates both the Western and Eastern Treatment Plants, some 400 kilometres of sewers and three major sewage pumping stations at Kew, Hoppers Crossing and Brooklyn. The Eastern and Western treatment plants are licensed by EPA Victoria. The system has some flexibility and Melbourne Water can divert up to 10% of daily sewage flows to the eastern or western systems via diversion points in the sewers at Kew and East Malvern.

Regular monitoring and maintenance of our sewerage system is carried out to ensure its effective performance and safety. This program includes identifying and fixing structural weaknesses and removing obstacles to flow such as tree roots.

We continually improve the treatment plants to ensure that they harness changing technology to treat effluent, increase opportunities for water recycling that lessen the impact on the marine environment.

### The eastern system

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Sewage and trade waste from Melbourne's south eastern and eastern suburbs is treated at the Eastern Treatment Plant and then transported via a 56 kilometre pipeline for release into Bass Strait at Boags Rocks on the Mornington Peninsula.

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Melbourne Water is committed to reducing environmental impacts on the marine environment at Boags Rocks. Regular monitoring of water quality is undertaken near Gunnamatta Beach, St. Andrew's Beach and the outfall, and Melbourne Water has begun a major project to reduce ammonia levels in treated effluent by 75%. The first stage of the project, which involves modifications to the existing tanks, will be completed by 2007. The construction of additional tanks will be completed in 2009. This will significantly improve the quality of water released into Bass Strait.

Some features of the eastern system are highlighted below.

## **Kew Pumping Station**

The Kew Pumping Station's prime function is to pump the sewage from Melbourne's north eastern suburbs into the South East Trunk Sewer for transfer to the Eastern Treatment Plant. Its average daily flow is 60 million litres and, at peak times, can reach 700 million litres. The pumping station was upgraded in the early 1990s to increase its capacity and avoid the potential for sewage spills in wet weather.

## **South East Trunk Sewer**

One of the largest sewers in Melbourne, the South East Trunk Sewer is the backbone of the eastern system, connecting the Kew Pumping Station to the Eastern Treatment Plant. All the other main sewers in the eastern system drain into this 30-kilometre sewer, which reaches four metres in diameter at its maximum. The South East Trunk Sewer carries an average flow of about 350 million litres per day, with capacity to reach a maximum of 1700 million litres a day.

## **The western system**

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The western system serves Melbourne's inner northern and western suburbs, north and west of the Yarra River and around Hobsons Bay. It comprises main and trunk sewers, two major pumping stations at Brooklyn and Hoppers Crossing and the Western Treatment Plant at Werribee. The Western Treatment Plant treats about 52% of Melbourne's domestic sewage and 70% of Melbourne's trade waste. Treated effluent from the plant is discharged into Port Phillip Bay.

Melbourne Water has recently completed a major upgrade of the Western Treatment Plant to reduce the amount of nitrogen in the treated effluent that is discharged into Port Phillip Bay. The upgrade will reduce the amount of nitrogen entering the bay by 500 tonne a year, reduce odour emissions from the Plant, and increase the amount of biogas that can be captured and used to generate electricity.

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Some features of the western system are highlighted below.

## **North Western Sewer**

The North Western Sewer is an 11-kilometre sewer that transfers flows from the Maribyrnong and Moonee Ponds sewerage systems to the Western Trunk Sewer at Brooklyn. The concrete-lined sewer, which is 4.4 metres at its maximum width, is 40 metres below the surface at its lowest point.

Commissioned in August 1998, the sewer currently services 150,000 households in suburbs including Sunshine, Footscray, Essendon, Keilor, Moonee Ponds, Pascoe Vale and Coburg and in the future has the capacity to service 200,000 additional households in the northern and western suburbs.

The completion of the North Western Sewer has eliminated sewage spills into the Moonee Ponds Creek and the Maribyrnong River during heavy rainfall and improved the water quality in those waterways as well as Port Phillip Bay. The North Western Sewer was the second largest addition to Melbourne's sewerage system in 100 years.

## **Brooklyn Pumping Station**

Built to service Melbourne's rapidly growing population and its increasing volumes of sewage, the Brooklyn Pumping Station started operation in 1964, replacing the Spotswood Pumping Station, which had been operating since the 1890s.



Sewage flows by gravity through about 144 kilometres of main and trunk sewers, including the 2.8 metre diameter Brooklyn Trunk Sewer, to the Brooklyn Pumping Station. The sewage arrives at Brooklyn 50 metres below ground level and is then lifted 25 metres through rising mains to the Western Trunk Sewer to allow the sewage to flow by a gravity tunnel to the Hoppers Crossing Pumping Station.

## **Spotswood Pumping Station and Spotswood Sewer**

In March 1989, the Museum of Victoria took over management of the Spotswood Pumping Station site and the historic buildings are now a major feature of Scienceworks.

Spotswood is at the junction of two main sewers in the western sewerage system, the North Yarra Main and Hobsons Bay Main. These mains connect to the Brooklyn Trunk Sewer, which transfers approximately 40% of Melbourne's sewage flows.

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Sewage passes through two major 'drop structures' via spillways from these two mains to enter the Brooklyn Trunk Sewer, which is at a lower level. This movement of sewage results in the emission of high levels of hydrogen sulphide gas. If untreated, the gas can cause corrosion and odour problems. To counteract this, the gas is extracted from the sewer and pumped through odour control plants where it is treated and then released to the atmosphere through a vent stack.

## Western Trunk Sewer

Prior to the commissioning of the Western Trunk Sewer in 1993, sewage was transferred via an open channel that stretched from Newport to Werribee, which had been operational since 1897. The main outfall sewer was replaced because it had reached the end of its service life, there was a need to increase the hydraulic capacity of the sewer for future flows, and there was a need to reduce odour. The Sewer is nearly 23 kilometres long and extends from the Brooklyn Pumping Station to the Western Treatment Plant.

## Hoppers Crossing Pumping Station

The Hoppers Crossing Pumping Station, located on six hectares about 20 kilometres west of Melbourne, is one of the largest sewage pumping stations in Australia. The Station was commissioned in 1992 and is the size of a 22-storey building, although only a quarter of it is visible above ground.



Hoppers Crossing Pumping Station lifts unscreened sewage from the Western Trunk Sewer and transfers it to the Western Treatment Plant for treatment.

The plant is fitted with eight pumps. Each pump stands 4.5 metres high, is four metres across, weighs 45 tonnes and is capable of pumping in excess of 5000 litres a second. The eight pumps are driven by eight 3150

kW variable speed motors that allow the pump to vary the speed depending on the volume of incoming sewage flow. Four motors have systems that enable them to feed power that would otherwise be wasted as heat emission back into the internal power supply system.

## Further information

For further information on Melbourne's sewerage system, visit [melbournewater.com.au](http://melbournewater.com.au). Virtual tours and separate *Essential Facts* are available for both the Eastern and Western Treatment Plants at this site.