

# Water Quality at the Barcoo Outlet and Patawalonga Lake

– a summary



## Introduction

In 2001, the Barcoo Outlet was constructed to divert stormwater from the Patawalonga catchment away from the Patawalonga Lake and out to sea. Seawater is circulated through the lake with the aim of supporting a sustainable seawater lake that is safe for recreational use.



Diversion to the Barcoo Outlet

Between May 2002 and February 2003, the Environment Protection Authority (EPA) conducted a study on the water quality of the Patawalonga Lake and beaches near the Barcoo Outlet during and after storms.

This brochure summarises the results of this study. The full report, *The impact of rain on water quality at the Barcoo Outlet and Patawalonga Lake*, can be viewed at [www.epa.sa.gov.au/pub.html](http://www.epa.sa.gov.au/pub.html)

Stormwater typically contains pollutants such as heavy metals, nutrients, oil and hydrocarbons. Stormwater often contains faecal matter, as well as suspended solids, which can increase the turbidity (cloudiness) of the water. Faecal matter can come from either human sources (septic tanks or sewage overflows) or animal sources (livestock, dogs, cats, birds and wildlife) and can make the water it contaminates unsuitable for recreational use.

Water samples were collected from the Patawalonga Lake and nearby beaches whenever more than 5 mm rain fell at Adelaide airport. Samples were collected each day for at least three days after the initial rainfall to investigate how the water quality in the lake and at the beaches was affected. The number of bacteria and the turbidity in each sample were measured. Bacterial contamination was compared with national and World Health Organization (WHO) guidelines and classified as good, moderate or poor.



The Patawalonga Lake



Diversion weir in the northern section of the Patawalonga Lake

## ***What did we find?***

The results of our study can be summarised as follows:

- Water quality in the Patawalonga Lake was poor for three days after rain due to faecal contamination from stormwater entering the lake.
- Water quality on the beaches was poor on the first day following rain, but moderate to good on subsequent days.
- Although most stormwater in the catchment is diverted out to sea via the Barcoo Outlet, a considerable amount of stormwater still drains into the southern end of the Patawalonga Lake and leaks through the weir at the northern end of the lake.
- Water clarity was poor to moderate at the beaches immediately after stormwater discharge, but improved to moderate on the second day. Resuspension of particulate matter by wind and waves is probably a contributing factor.
- In comparison, clarity was good in the Patawalonga Lake following most rainfall, possibly because the water is calmer than in the sea, thus allowing more rapid settling of sediment.
- Discoloured or turbid water along the beaches near the Barcoo Outlet may indicate that stormwater has recently entered the sea.
- Turbidity is not a good indicator of stormwater contamination in the Patawalonga Lake as it is often not possible to see any difference after rain, even if stormwater has entered the lake.
- Importantly, the water quality in the Patawalonga Lake and at the beaches is similar to that of other beaches adjacent to river or large stormwater outlets following storms.

## Factors affecting the water quality of the Patawalonga Lake

The extent of the Patawalonga catchment is approximately 230 km<sup>2</sup> and includes streams such as the Sturt River, Brownhill Creek, Keswick Creek and some smaller tributaries and drains. The majority of the catchment is made up of residential, industrial and commercial areas, with native vegetation, rural areas and recreational parks found mainly in the upper reaches of the catchment.

Stormwater from the catchment can carry faecal matter from horses, pets and wildlife (including birds) to stormwater drains or nearby streams. Most of the run-off from the catchment flows through the Barcoo Outlet into the sea, but some still enters the Patawalonga Lake, particularly during large storms. Stormwater from the local Glenelg and Glengowrie region (an area of



One of the signs placed along the Patawalonga Lake

approximately 2 km<sup>2</sup>) is not diverted through the Barcoo Outlet, but enters the lake near the lock gates.

Due to the pollutants that can be in stormwater, signs have been placed along the beaches and the Patawalonga Lake advocating caution in recreational areas that receive stormwater. The signs advise the public to avoid activities such as swimming, windsurfing, waterskiing and canoeing in areas where discoloured water is visible, or after recent rainfall.

## What can you do to help reduce pollution in the Patawalonga Lake and nearby beaches?

Everybody can help to improve the quality of the state's waters and keep the beaches and the Patawalonga Lake clean and safe for recreational use. The EPA Stormwater Pollution Prevention Codes of Practice for the community, building and construction industry, and local, state and federal government provide some good tips on how to reduce the volume of stormwater entering the marine environment and how to improve stormwater quality. These Codes of Practice are available on the EPA web site at [www.epa.sa.gov.au/pub.html](http://www.epa.sa.gov.au/pub.html)

By taking some simple measures, you too can help to reduce water pollution. This can include:

- sweeping instead of using the garden hose to clean driveways
- reducing the paved areas in your garden to allow water to soak into the soil, decreasing the amount of runoff
- cleaning up after your pets and ensuring that their faeces do not enter the stormwater system
- cleaning septic tanks of sludge at least once every four years and ensuring that no wastewater is coming to the surface.



## *The future*

Several positive developments, most already implemented, will help to improve the water quality in the lake and nearby beaches:

- The introduction of the Environment Protection (Water Quality) Policy 2003 and supporting codes of practice and fact sheets produced by the EPA aim to reduce stormwater pollution. The Code of Practice for Industrial, Retail and Commercial Stormwater Management has been released for public consultation.
- The Adelaide Coastal Waters Study, due for completion in 2006, will increase knowledge of South Australia's marine environments and will help agencies to manage the quality of our waters.
- Initiatives by many agencies, such as the EPA, catchment water management boards, local councils, Department of Water, Land and Biodiversity Conservation and community groups are helping to reduce stormwater pollution in the Patawalonga catchment by educating and raising awareness. Some of these initiatives include stormwater pollution prevention programs for industry. Wetlands and trashracks have also been established in the catchment to improve stormwater quality.
- Civil works have been undertaken to reduce the volume of stormwater entering the lake through the diversion pond at the northern end of the lake.

Ongoing monitoring of the metropolitan coast, with additional sites around Glenelg, will help to determine the long-term quality of the beaches. The inclusion of the Patawalonga Lake in the EPA's monitoring program will provide long-term data on the water quality of the lake and allow trends to be determined. This information can then be used in management decisions concerning the lake.



North of Glenelg Beach

## Further reading

The following reports are available from the EPA web site: [www.epa.sa.gov.au/pub.html](http://www.epa.sa.gov.au/pub.html)

Environment Protection Authority 1997, *Ambient water quality monitoring of Gulf St Vincent's metropolitan bathing waters. Report no. 1*, Department for Environment, Heritage and Aboriginal Affairs, Adelaide.

Gaylard, S 2003, *Ambient water quality monitoring of Gulf St Vincent's metropolitan coastal waters, Report no. 2*, Environment Protection Authority, Adelaide.

Corbin, T & Gaylard, S 2005, *Impact of rain on water quality at the Barcoo Outlet and Patawalonga Lake*, Environment Protection Authority, Adelaide.

### Websites

WaterCare: [www.watercare.net](http://www.watercare.net)

CWMBs: [www.catchments.net](http://www.catchments.net)

DWLBC: [www.dwlbc.sa.gov.au/urban/index.html](http://www.dwlbc.sa.gov.au/urban/index.html)

For further information on the operation of the seawater circulation system contact the Department of Water, Land and Biodiversity Conservation, GPO Box 2834, Adelaide, SA, 5001.  
Telephone: (08) 8436 6800.

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Marker showing the Barcoo Outlet discharge point