

MSSA Guidelines in Relation to Storm Water Discharge

The following guidelines have been prepared by MSSA to assist OWS Organisers assess risk associated with storm water discharge at OWS venues along the Adelaide metropolitan coastline. The current MSA Open Water Organisers Guide (MSA website) does not contain any guidelines with respect to polluted water.

The Issue:

Storm water discharge (“dirty”, “discoloured”, “turbid” or “polluted” water) associated with rainfall in the summer months is a potential health risk that needs to be considered by organisers of MSSA open water swims. In recent years these adverse conditions were responsible for the cancellation of the Charles Sturt Challenge (2014) the Brighton Jetty Classic (2012) and the Pink Swim (2016). Cancellation of the 2015 Noarlunga OWS was avoided when the Organisers were able to shift the course away from a storm water drain. (Cancellation of the Marion OWS in 2010 and re-scheduling of the Noarlunga OWS in 2012 was due to rough seas rather than polluted water).

Health Consequences:

There is a mild risk that ingestion of stormwater could cause mild illness such as stomach upset

EPA Alert (Advisory) Service:

The EPA monitors beaches from Semaphore in the north to Noarlunga in the south and has an alert service to advise of adverse beach conditions. You can opt to receive notifications via email by subscribing for updates (see **Figure 1**; register here:

www.epa.sa.gov.au/data_and_publications/water_quality_monitoring/beach_water_advice)

You can also choose to receive advice on-line from AlertSA, the official South Australian Government Website and Mobile App (www.alert.sa.gov.au/map).

The advice is sent during periods of poor water quality when swimming should be avoided in discoloured water while a follow-up message will indicate when stormwater discharges have ceased and it is safe to swim again. On days when the water quality is poor, beaches on the EPA Water Quality website map (**Figure 1**) will be flagged in real-time at locations where stormwater is discharging and impacting on water quality

EPA Study:

The impact of storm water discharge along Adelaide’s coastal waters has been investigated in a number of studies with the most relevant being an EPA study of the Patawalonga Lake and Barcoo Outlet (Corbin and Gaylard, 2005) (**Figure 2**). While the report concentrates on the Patawalonga Lake and adjacent beaches it did include the location for the State Open Water Championship in front of the West Beach Surf Club. This study demonstrated that there was a reasonable relationship between turbidity and enterococci concentration at beaches near the Barcoo Outlet, with the highest concentration usually accompanied by elevated turbidity. After rain, water at the beach was often visibly turbid and turbidity may therefore be a useful indicator of recent rain and the possible presence of harmful bacteria. Turbidity remained elevated at the beach sites for two days following initial rainfall even though the concentration of enterococci was below the guideline levels

by this time. Using only turbidity as a warning tool may be an overly cautious approach, but may still adequately reflect the potential for high bacterial levels in coastal waters.

EPA Monitoring Sites:

The Adelaide and Mount Lofty Natural Resources Management Board have established a number of monitoring sites along rivers, creeks, inlets and drains within the metropolitan area (**Figure 4**). Although a few sites are located near river mouths there are no permanent sites along the coast. Data recorded at the monitoring sights includes water level, flow, water temperature and (most importantly) turbidity. The information is recorded in 10 minute intervals and is available in real time as raw data and graphs on the EPA website <http://wds.amlr.waterdata.com.au/Amlr.aspx>. Other parameters (eg. ph and concentration levels of phosphorous, nitrogen, copper, lead and zinc) are measured on a monthly basis and are also reported on the EPA website.

Unfortunately there are only a few “end of catchment” sites that would be relevant to assessing water quality close to our open water swim venues (**Figure 5**). These include the **Torrens River at Seaview Road Bridge (A5041014) (Figure 6)** site which would be most relevant, given prevailing wind and current directions, to the Charles Sturt Challenge OWS at Henley Beach. Turbidity and other parameters for this site are shown in **Figures 7 and 8)**

There are two sites along Patawalonga Creek near the Barcoo Outlet (**Patawalonga Creek @ Barcoo Collection Pond (A5041059) and Patawalonga Creek u/s Barcoo Outlet (A5041022) (Figure 5)**). These monitoring sites would be useful in assessing water quality near West Beach (State Championships venue) however current measurements only include water level and salinity. Outside the metropolitan area there are currently no permanent sites to monitor water quality at Port Noarlunga, Port Elliot or Port Augusta.

There is no merit in MSSA collecting water samples for analysis as it takes 3 days for test results to be made available.

Future Consideration:

Current EPA guidelines do not provide any simple quantitative measure of turbidity that could be used simply and within a short time frame by OWS Organisers. One semi-quantitative technique that may be considered in future is use of the Secchi Disk. The disk is opaque and typically white or black and white, 30 cm in diameter, and measures the depth—known as the Secchi depth—at which the disk ceases to be visible from the surface. Depth criteria would need to be developed that clearly establishes unsafe turbid water, recognising that water clarity can be influenced by a number of other factors (strong wind and wave action, cloudy days, etc.) which would not be of any concern.

Summary:

Based on a number of studies including the Patawalonga Lake and Barcoo Outlet EPA study a 3 day rule has been recommended as the safe period in which to avoid swimming in areas near storm water drains. However the EPA study found that a number of metro beaches were within World Health Organization risk to human health criteria 2 days after rain. At the West Beach SC location bacterial concentrations fell below recommended limits after one day. It is hard therefore to give an exact time frame for safe swimming after rain as there are many factors influencing the mixing and dispersal of urban runoff (wind, wave action, tide, temperature, light intensity, amount of rain size of catchment area, etc.). So the 3 day rule is considered to be conservative

and the Event Coordinator may safely consider holding an event one day after storm water discharge provided no significant turbidity remains in the water.

Recommended Guidelines:

1. As part of the Event Sanction procedure (Event Management and Risk Analysis) establish whether an alternate course design could be considered in the case of storm water discharge.
2. Subscribe for updates from the EPA website:
www.epa.sa.gov.au/data_and_publications/water_quality_monitoring/beach_water_advice
3. Closely monitor local weather (rainfall) patterns in the catchment area adjacent to the coastal venue in the week preceding the OWS.
4. If rainfall or a storm occurs or is predicted ahead of the event check wind, wave and tide charts for likely impact on the OWS venue www.seabreeze.com.au/weather/sa/adelaide;
5. In the event of significant rainfall in the 3 days preceding the OWS the Event Organiser should inspect the course on a daily basis to check for the extent and level of turbidity. The EPA website should be consulted for beach warnings. Current and predicted conditions should be reviewed and the feasibility of shifting the course away from dis-coloured water should be considered
6. Provided no significant turbidity remains in the water the event should proceed as planned on the original course
7. Should significant turbidity remain in the water one day prior to the event, it is considered unlikely that conditions will improve, and there is no option to shift the course the Event Coordinator, following consultation with the Event Safety Officer, Branch Safety Officer and Open Water Swim Director will cancel the event.
8. Should a decision be taken to cancel (or postpone) the event all officials and competitors should be notified immediately. Registration fees are normally non-refundable although clubs may decide that some or all of fees will carry forward to the next year

Reference:

Corbin, T. and Gaylard, S., 2005- The impact of rain on water quality at the Barcoo Outlet and Patawalwonga Lake, EPA, Adelaide, 64pp

Prepared /updated by Ian Young, June, 2016

Figure 1: EPA website page

Beach water advice



During the summer, beachgoers will be able to receive advice when the water quality at their local beach is not suitable for swimming.

Beaches in Adelaide are safe and healthy for 98% of the time. However, the water quality at beaches can be impacted by rainfall which flush stormwater into the sea leaving discoloured water especially around drains.

The Department of Health and Ageing has advised that people should not swim in discoloured or murky water and through this program beach users will have easy access to current information to enable them to make that decision.

Beach users can opt to receive notifications via email by subscribing for updates (located above the map). You can also choose to receive online advice from [AlertSA](#).

The advice will be sent during periods of poor water quality and swimming should be avoided in discoloured water. And when stormwater discharges have ceased, a follow-up message will indicate that it is safe to swim again.

On days when the water quality is poor, beaches on this map will be flagged in real-time at locations where stormwater is discharging and impacting on the bathing water quality. Discharging is only expected to last a few days.

The beaches being monitored are from Semaphore in the north to Noarlunga in the south.

- [Stormwater warnings](#)
- Find out where the [monitoring sites](#) are

Subscribe for updates

Direct to your inbox

Subscribe



Figure 2: EPA Stormwater warning page (with map)

 **Government of South Australia**
Adelaide & Mount Lofty Ranges
Natural Resources Management Board

Coastal Rivers and Creeks – Monitoring Water Quality

In South Australia we are lucky to have great beaches and recreational lakes in which to swim and participate in water sports. Along the metropolitan coastline, our beautiful long, white beaches are generally clean and safe for everyone to enjoy. Water quality monitoring completed by the EPA indicated that “beaches were safe for recreational users in terms of microbiology; however, there are instances where the turbidity at some beaches may reduce visibility in the water” (EPA, 2004).

Across the metropolitan area we have a network of stormwater drains that collect run-off from our streets and gutters when it rains. Nearly all of metropolitan stormwater flows to the sea through the stormwater system, as well as the creeks and rivers situated along the Adelaide Plains. These include the River Torrens, Barcoo Outlet, Onkaparinga River and Christies Creek.

The Natural Resources Management Board, together with local councils, has taken action to improve the quality of stormwater. However during large rainfall events water quality does decline for a short period of time.

The water flowing out of these stormwater systems after rain can be discoloured and has contaminants associated with the pollution washed off of our streets. Summer storm events that occur after long dry periods have the largest impact because material accumulated over several weeks is washed into the sea.

Stormwater can be unpleasant to look at, reduces visibility and can smell. There is also a risk that ingestion of the stormwater could cause mild illness such as a stomach upset. It makes sense to avoid swimming in this water which is usually contained to areas near discharge locations. Even after heavy storms, the discoloured water will normally disappear within 2-3 days.

Signs have been erected on some metropolitan beaches to mark sections of beach that have a significant stormwater outlet nearby. They warn beachgoers that polluted stormwater could be discharged into the sea after rain and to avoid swimming if water is discoloured.

Stormwater Warning

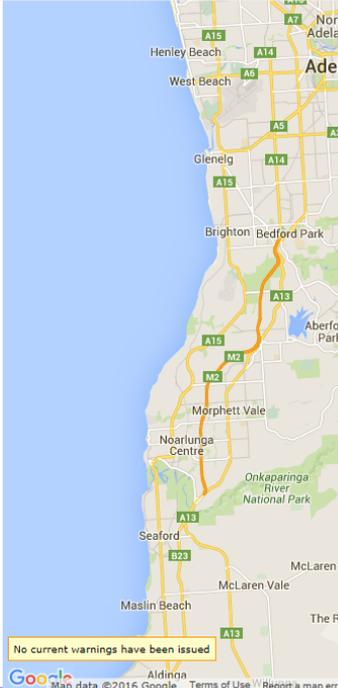
The Natural Resources Management Board has a network of monitoring stations to assess the flow and quality of stormwater within creeks and rivers that discharge to the coast.

Stormwater flow is collected on a continuous basis and can indicate when stormwater events are occurring which could discharge to the sea.

Current data from these coastal sites is presented graphically with a CAUTION ⚠ icon present when stormwater events are occurring.

Additional information regarding these monitoring stations is available at the [AMLNRNM monitoring network website](#) or click on a warning sign on the map to access site information directly.

It should be noted that these datasets are unverified and only provide an indication of stormwater run-off.





CAUTION
AVOID SWIMMING
IN DISCOLOURED
WATER AFTER
RAIN



**POLLUTED
STORMWATER**

No current warnings have been issued

Google Maps data ©2016 Google Terms of Use Report a map error

Figure 3: EPA Study

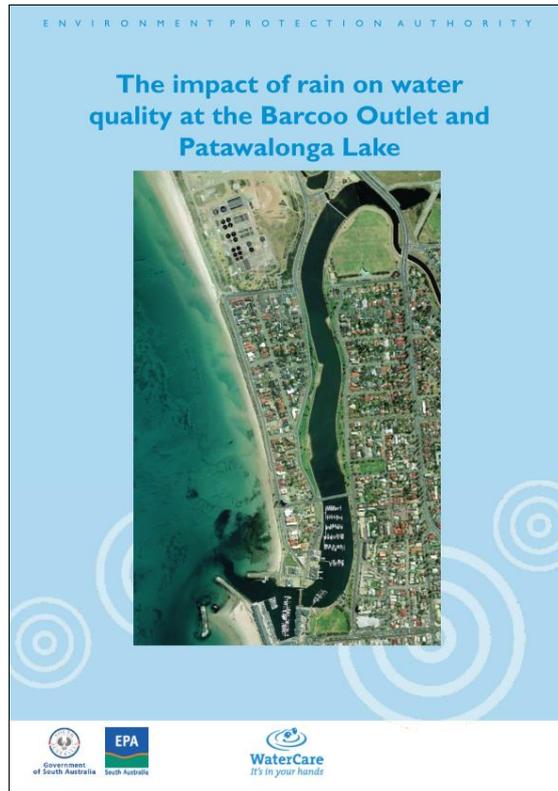


Figure 4: EPA Monitoring sites

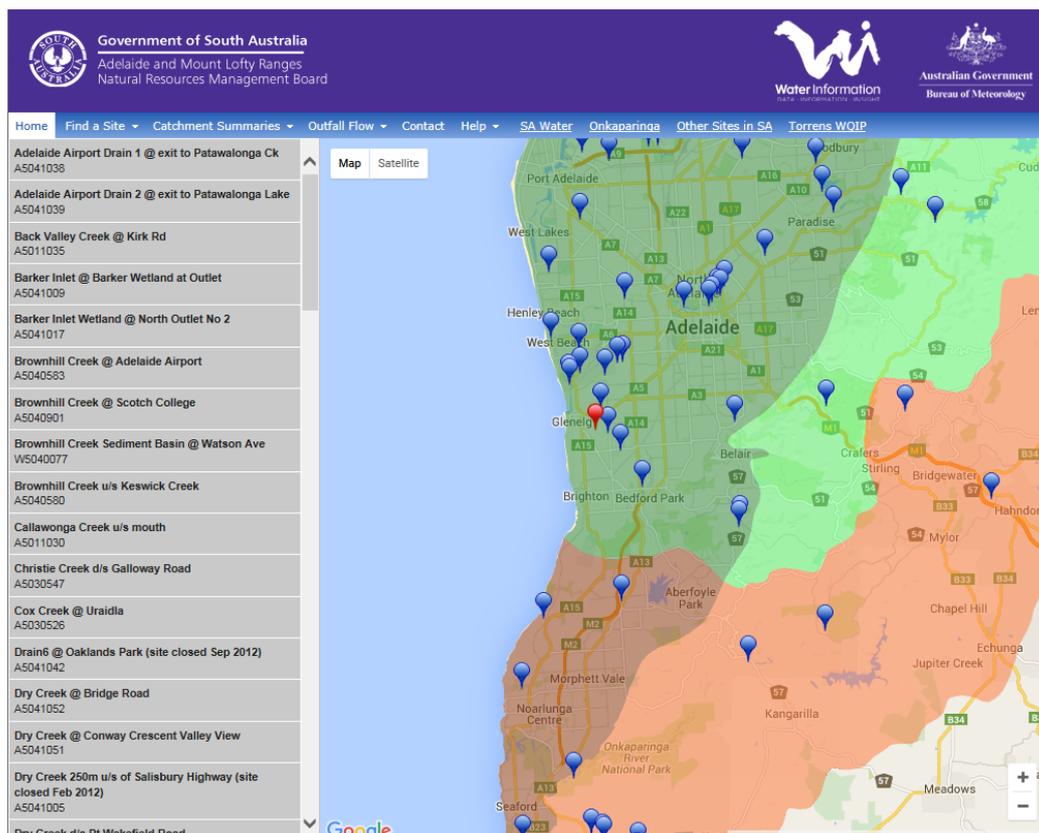


Figure 5: Relevant Monitoring Site locations (Torrens River and Patawalonga Creek):

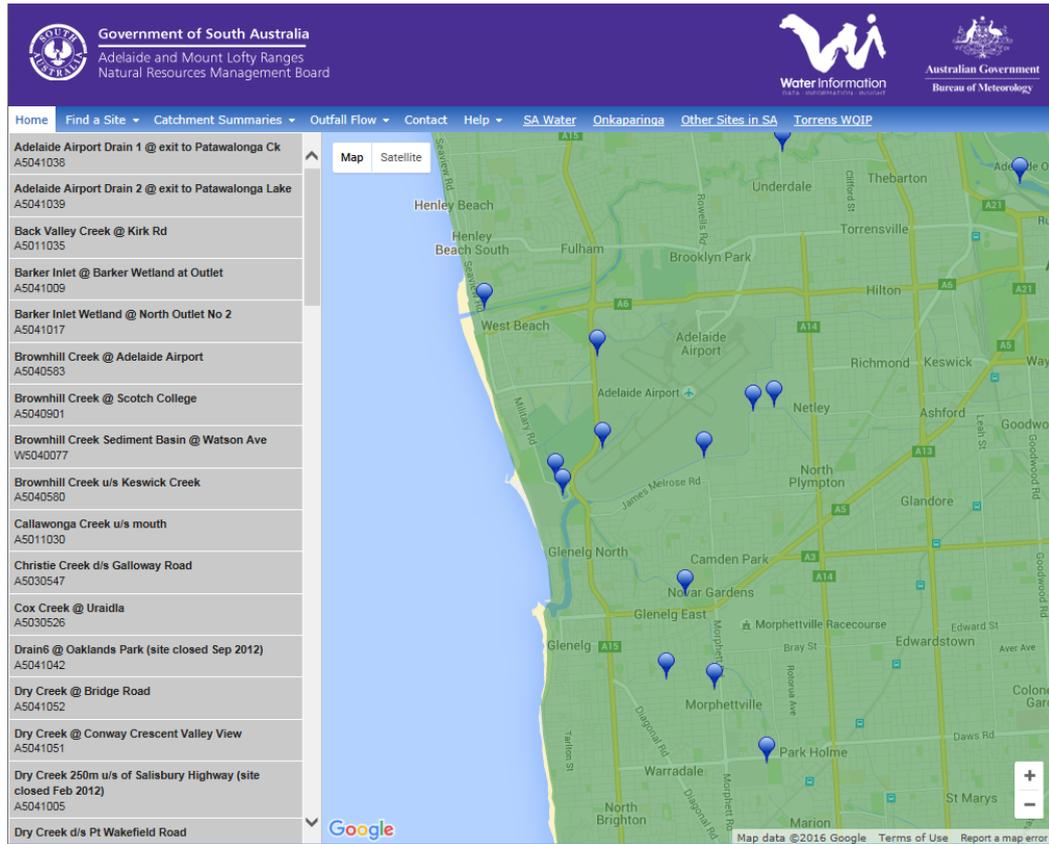


Figure 6: Torrens River monitoring site description

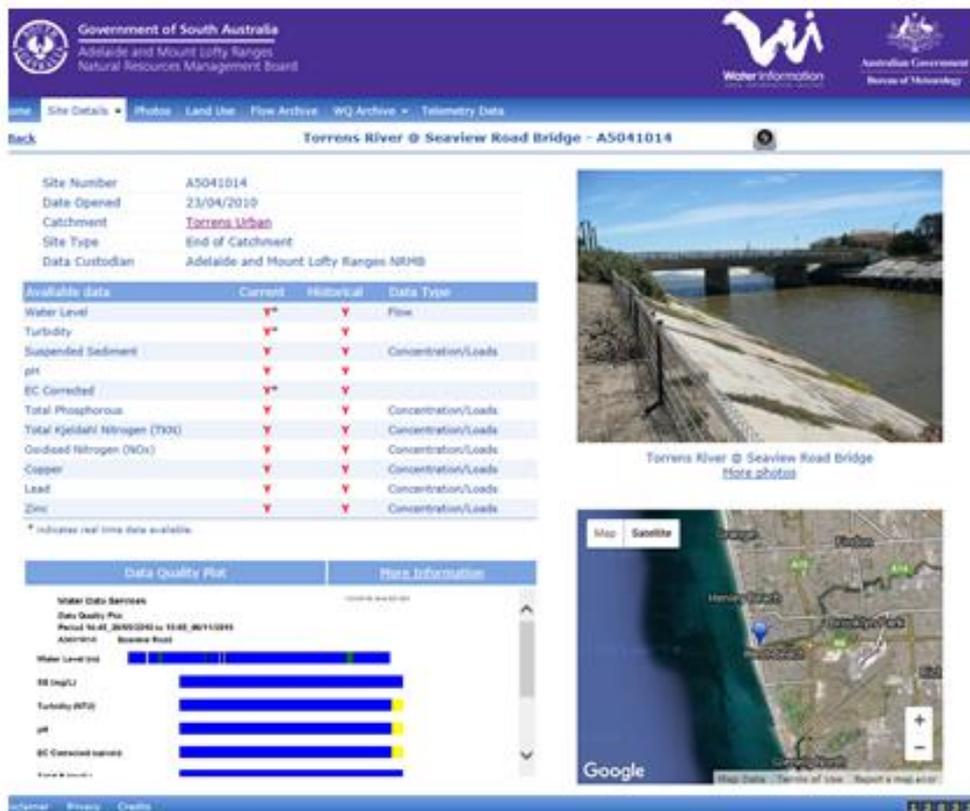


Figure 7: Turbidity graph for Torrens River site

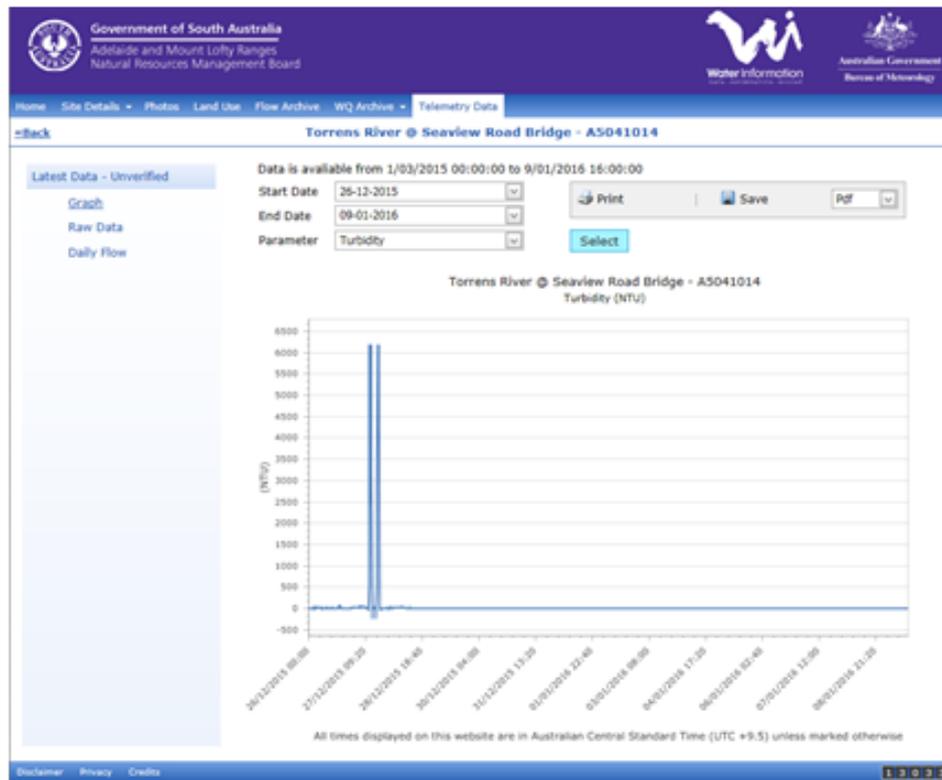


Figure 8: Measured parameters for Torrens River site

