Morambro Creek and Nyroca Channel PWCs and Morambro Creek PSWA

2015 Surface water status report

Government of South Australia
Department of Environment, Water and Natural Resources

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This document is available online at www.waterconnect.sa.gov.au/Systems/GSR/Pages.

To view the *Morambro Creek and Nyroca Channel PWCs and Morambro Creek PSWA Surface water status report 2010–11*, which includes background information on rainfall, streamflow, salinity, water use and relevant water-dependent ecosystems, please visit the *Water Resource Assessments* page on WaterConnect.

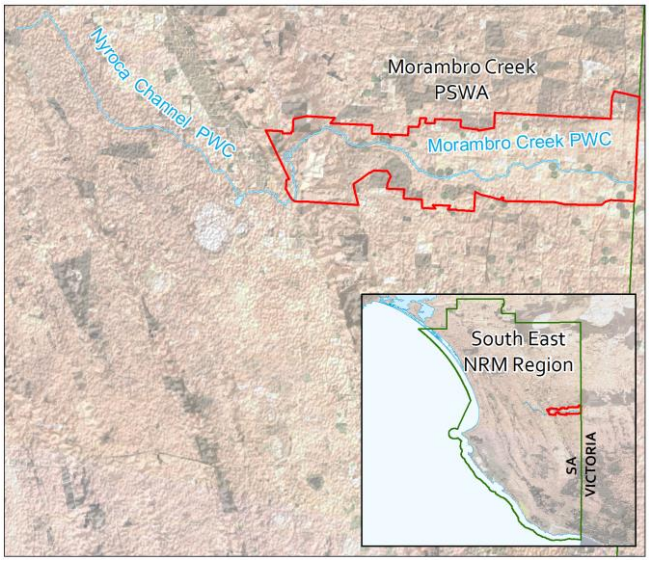
For further details about the *Morambro Creek and Nyroca Channel PWCs and Morambro Creek PSWA*, please see the *Water Allocation Plan* for the *Morambro Creek and Nyroca Channel Prescribed Watercourses including Cockatoo Lake and the Prescribed Surface Water Area* on the Natural Resources South East website.

Gridded rainfall data was sourced from the Bureau of Meteorology (BoM). Station rainfall data was sourced from the Scientific Information for Land Owners database (SILO) and is Patched Point Data. Further information on SILO climate data is available at: http://www.longpaddock.qld.gov.au/silo/index.html.

Streamflow and salinity data are available via WaterConnect.

To view descriptions for all status symbols, please visit WaterConnect.

2015 Summary



Description of the Prescribed Area

The Morambro Creek and Nyroca Channel Prescribed Watercourses (PWC) and Morambro Creek Prescribed Surface Water Area (PSWA), hereafter referred to collectively as the Prescribed Area (PA), is located approximately 280 km south-east of Adelaide, with its eastern boundary along the Victoria border and covering an area of 225 km^2. Surface water (including within watercourses) in the PA have been prescribed under South Australia's *Water Resources Act 1997*. A Water Allocation Plan (WAP) developed by the South East Natural Resources Management Board and adopted in 2006, seeks to provide for sustainable management of these water resources.

The topography of the PA is predominantly characterised by flat plains with slight variations in elevation occurring in the western most section. The main watercourse within the PA is the Morambro Creek, an ephemeral system with headwaters originating in the Wimmera region of Western Victoria, travelling east–west through the PA, before terminating in Cockatoo Lake. From here, a spillway allows water to enter the Nyroca Channel flowing for approximately 30 km in a north-westerly direction before discharging into the Marcollat watercourse.

The status of the surface water resources in the Morambro Creek PA is highly dependent on rainfall, with trends in streamflow and salinity primarily climate driven, i.e. below-average winter rainfall results in a reduction in annual streamflow volumes. Below-average summer rainfall can also result in increasing irrigation extractions, and these two elements can cause salinities to increase by reducing the amount of streamflow available to dilute salts. Conversely, increases in rainfall can result in increases in streamflow volumes, decreases in irrigation extractions and salinities may stabilise or decline.

Rainfall summary

The Frances rainfall station (M026007) is located along the eastern-edge of the Morambro Creek PA where annual rainfall totalled 299 mm in the 2014–15 water-use year, 222 mm below the long-term average annual rainfall (Fig. 1). Last year's rainfall was the lowest of the past 36 years at the Frances rainfall station (the period which aligns with the period of available streamflow data). During the 12 months to June 2015, only two months (January and May) had above average rainfall, with the winter and spring months of July to November recording below average rainfall during the last water year. The spatial distribution of rainfall for the past five-years shows average annual rainfall below the long-term average throughout the majority of the PA, with the exception of the eastern region and the southern boundary where the five-year rainfall average was more comparable to the long-term average (Fig. 3). The spatial distribution of rainfall for 2014–15 shows well below average rainfall across the entire PA.

Streamflow summary

The Morambro Creek gauging station (A2390531) at Bordertown-Naracoorte Road Bridge is the sole streamflow gauging station located within the PA. Annual streamflow recorded at Morambro Creek gauging station was 0 ML in the 2014-15 water-use year, the seventh time no flow has been observed since 1979, and ranks in the 0–25th percentile (%ile) range of streamflow over the period of record. As a comparison, the station has a long-term average annual streamflow of 3442 ML and recorded a flow of 5271 ML in 2013-14 (Fig. 2). Located approximately 15 km downstream of the Morambro Creek gauging station is the Cockatoo Lake monitoring station which received no flow from Morambro Creek in 2014–15 and measured a lake water level drop of over 1 m, from 38.4 m AHD to 37.2 m AHD during this period. The spill level of Cockatoo Lake into the Nyroca Channel is 39.15 m AHD and as water level was below this level no flow entered the Nyroca Channel.

The annual streamflow volume recorded at Morambro Creek from 1979 to 2015 (Fig. 2) indicates a long-term declining trend, with less frequent years of above average streamflow since 1997 compared to the preceding two decades. This declining trend correlates with the predominantly below-average rainfall recorded in the Morambro Creek PA since 1997.

Water use summary

Surface water use data in the PA is limited. The PA was prescribed in response to an increase in demand for water for aquifer recharge schemes to address the increasing salinity of the adjacent underground water resource in the Padthaway Prescribed Wells Area. The low reliability of streamflow in Morambro Creek has meant that there has been no systematic development of the surface water resource. Currently there are only four licenses within the PA, of which one has the ability to divert water.

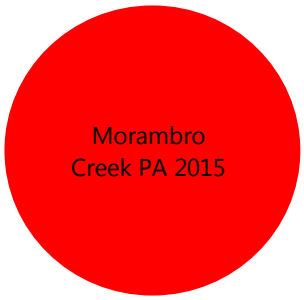
Salinity summary

Due to the ephemeral nature of Morambro Creek and the streamflow generated being short lived in response to heavy rainfall, there are large data gaps in salinity data when the stream is dry. Salinity data is unavailable for the 2014-15 water year as there was no streamflow during this period. However, during times of streamflow the Morambro Creek gauging station provides a reliable indication of salinity (TDS) with data recorded generally being less than 250 mg/L TDS, indicating a very fresh section of watercourse (Fig. 4).

Status summary

To determine the status of the Morambro Creek PA for 2015, the total streamflow for the water use period July 2014 – June 15 (2014-15) is expressed as a percentile by comparing it to the annual streamflow data measured over the entire period of record (1979-80 to 2014-15). The percentile value indicates the percentage of records in the dataset that are equal to or below that streamflow. For example, if the 90th percentile annual streamflow is 100 ML, this indicates that 90 percent of the annual streamflow values over the entire period or record were equal to or lower than 100 ML/y. The 2014-15 annual streamflow is the 0 percentile. Status is defined based on which percentile grouping the current years' streamflow percentile value occurs within (shown in the image below). This is a new approach, compared to assessments used in past *Surface water status reports*. Please visit the Frequently Asked Questions on the *Water Resource Assessments* page on WaterConnect for more detail on the current method of evaluating the status of surface water resources.

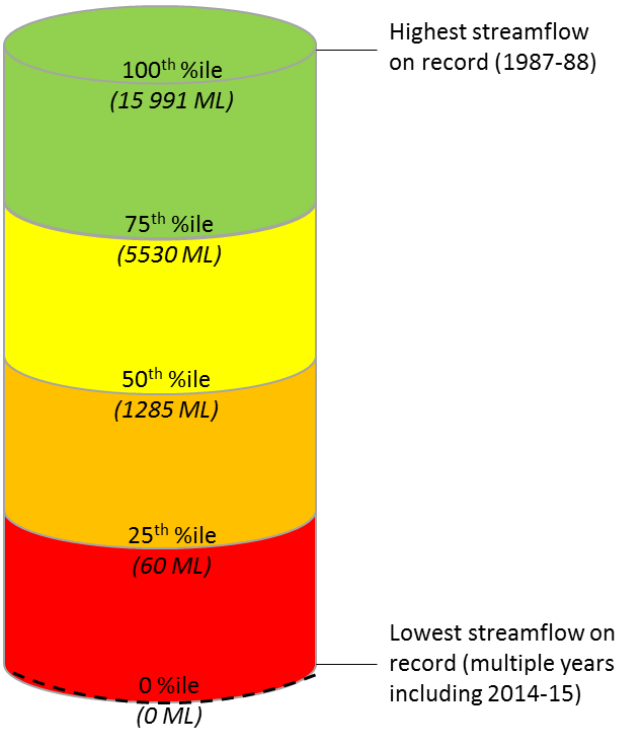
2015 Status



Morambro Creek at a whole PA scale is assigned a red surface water status for 2015 based on the status of streamflow:

'Annual streamflow was between the 0–25th percentile of the period of record'

This status report does not seek to evaluate the sustainable limits of the resource, nor does it make any recommendations on management or monitoring of the resource. These actions are important, but occur through separate processes such as prescription and water allocation planning.



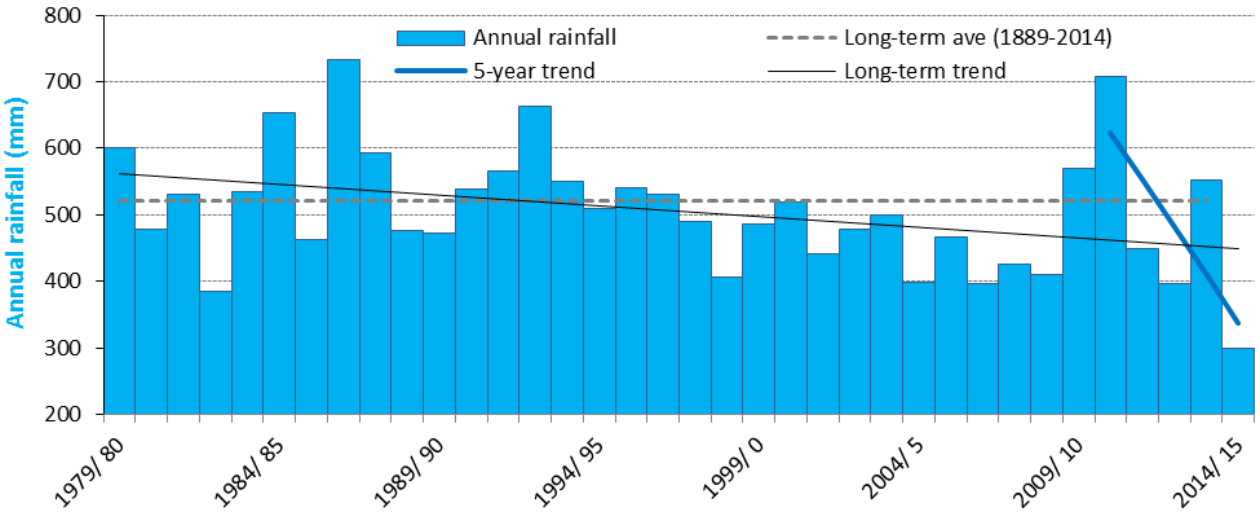


Figure 1. Annual rainfall (mm) for the 1979–80 to 2014–15 water-use years (July–June), the long-term trend and long-term average annual rainfall, and the short-term trend for the past five-years recorded at Frances rainfall station (M026007)

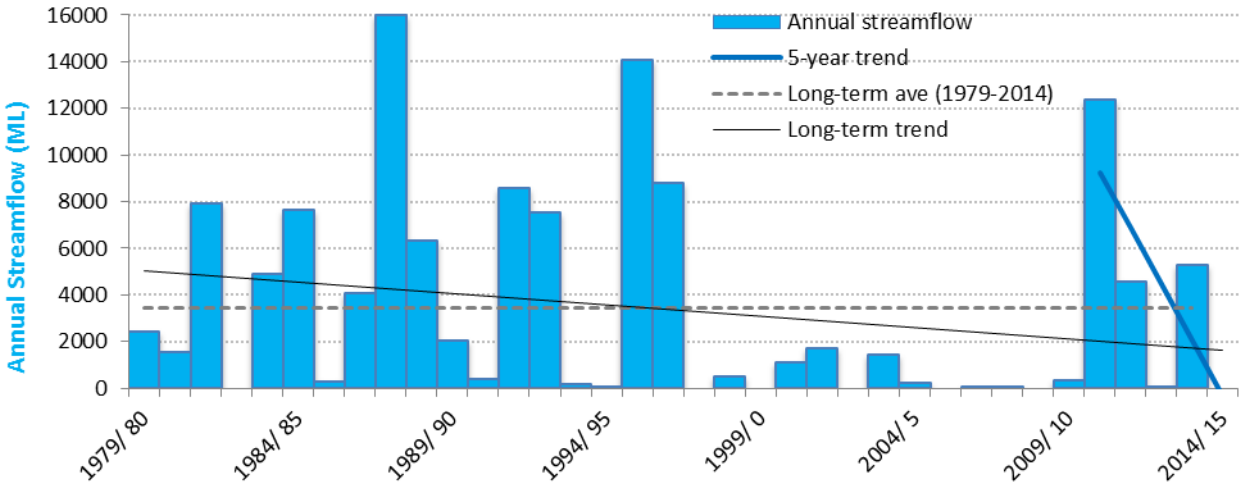


Figure 2. Annual streamflow (ML) for the 1979–80 to 2014–15 water-use years (July–June), the long-term trend and long-term average annual streamflow, and the short-term trend for the past five-years recorded at Morambro Creek gauging station (A2390531)

Figure 3. (1) Long-term and (2) five-year average annual rainfall and (3) annual rainfall for the 2014–15 water-use year in the Morambro Creek PSWA

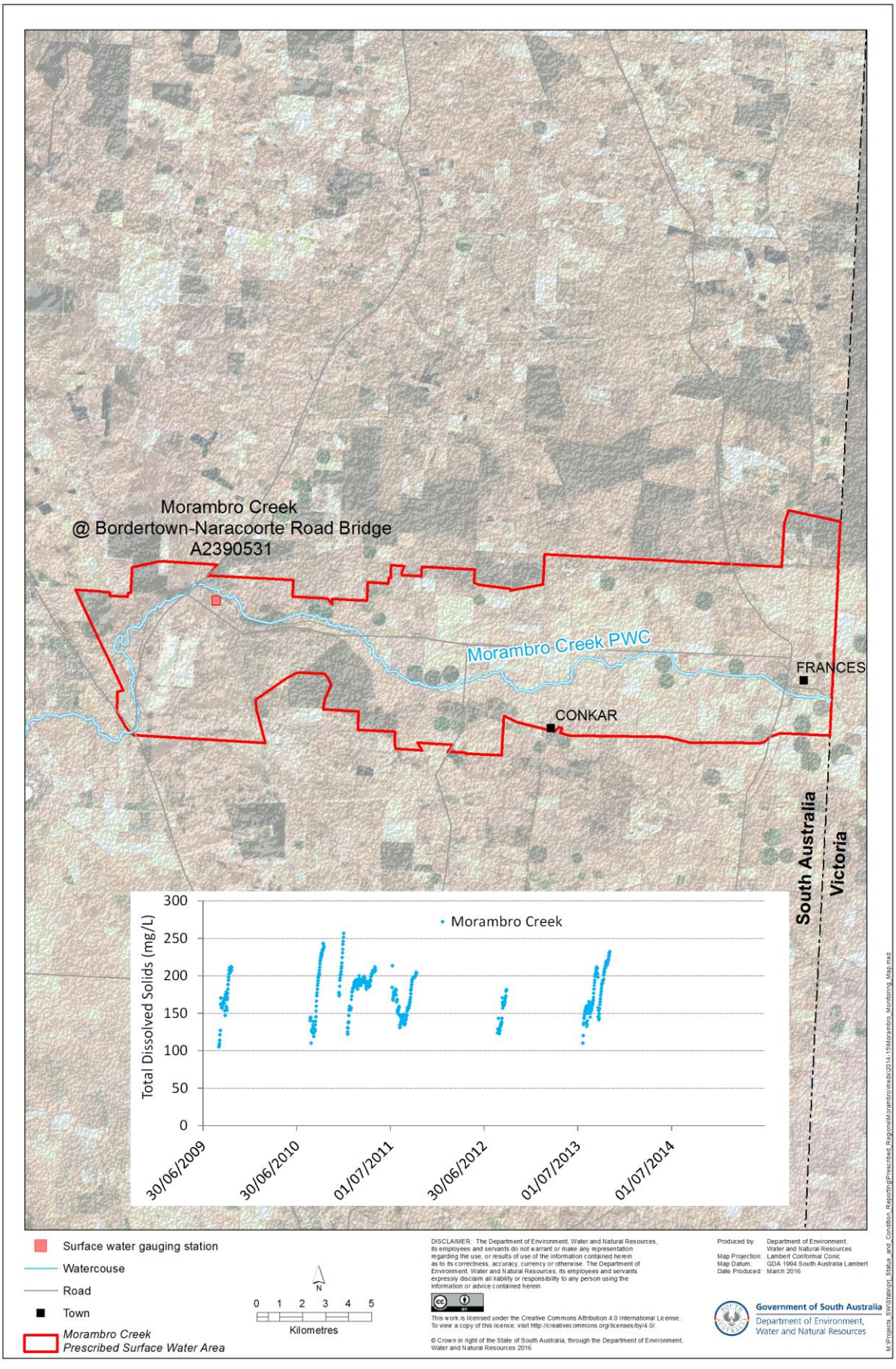


Figure 4. Surface water gauging station in the Morambro Creek PA and salinity data (TDS mg/L) for the 2009-10 to 2014-15 water use years at Morambro Creek at Bordertown-Naracoorte Road Bridge (A2390531) gauging station

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