Report on Managing Water Quality and Salinity – Commonwealth Environmental Water Holder

Commonwealth Environmental Water Holder's annual report on the implementation of the water quality and salinity management plan (Schedule 12, Item 14)

Reporting context

The water quality and salinity management plan provides a Basin-wide framework of water quality objectives and targets for Basin water resources. The water quality and salinity management plan is set out in Chapter 9 of the Basin Plan and includes a list of the key causes of water quality degradation, water quality objectives for Basin water resources and water quality targets for long-term planning.

The purpose of this report is to monitor the extent to which the water quality and salinity management plan has been implemented. This report is a requirement of Chapter 13 of the Basin Plan and relates to Item 14 of Schedule 12.

Indicators for measuring success

Implementation of the water quality and salinity management plan is evaluated using the following five indicators:

- Governments are having regard to water quality and salinity targets when managing water flows (**14.1**)
- Governments are having regard to water quality targets when making decisions about using environmental water (**14.2**)
- Recorded salinity at reporting sites is consistent with the salinity targets (**14.3**)
- Adequacy of the flushing of salt from the River Murray System to the Southern Ocean (salt export) (**14.4**)
- Measures governments take to achieve end-of-valley salinity targets (**14.5**)

Basin state governments report only on Indicators 14.1 and 14.2. The Commonwealth Environmental Water Holder (CEWH) reports only on Indicator 14.2.

14.1: Managing water flows with regard to water quality targets (s9.14)

14.1.1: What procedures and tools were in place to enable water quality targets (dissolved oxygen, recreational water quality and salinity) to be met

Response
CEWH not required to report on Matter 14.1.1

14.1.2: Statement that procedures and tools were used to meet water quality targets

Response
CEWH not required to report on Matter 14.1.2

14.1.3. Case study

Response
CEWH not required to report on Matter 14.1.3

14.2: How were water quality targets taken into account when making decisions about using environmental water

14.2.1. Statement that procedures and tools were in place

Response
The Commonwealth Environmental Water Holder had regard to the water quality targets set out in 9.14(5) when making decisions about the use of Commonwealth environmental water in 2014–15. The Commonwealth Environmental Water Office utilises expert regional knowledge, in-field monitoring and salinity forecast modelling to support the planning and active management of Commonwealth environmental water. For every Commonwealth watering action, a risk assessment is undertaken 'including with regard to the Basin Plan's water quality and salinity targets for managing water flows'. These risk assessments are guided by the *Risk Management Guidance for the Use of Commonwealth Environmental Water*, which specifically identifies the potential risks of Commonwealth environmental watering resulting in the water quality and salinity targets being exceeded, and provides guidance on mitigation strategies. As part of these risk assessments, contingency planning and procedures for monitoring and operational responses to risks are developed and integrated within the delivery arrangements for Commonwealth environmental water use. Delivery arrangements are agreed with state delivery partners through Watering Schedules. These schedules outline the operational strategies and procedures for the management of Commonwealth environmental water, including the on-going assessment and management of water risks where required.

14.2.2. Statement of how procedures and tools were used

Response

In 2014–15 risk assessments, which included the potential risks of exceeding the water quality targets, were undertaken for all Commonwealth water use actions.

No Commonwealth environmental watering actions were found to have resulted in adverse water quality impacts. There were also no major natural events that led to the water quality targets being exceeded and that required a response from the Commonwealth Environmental Water Holder, or in the case of elevated salinity in the Lower Darling, that Commonwealth environmental water could feasibly have contributed to.

In 2014–15, the delivery of Commonwealth environmental water contributed to improved water quality including reduced salinity, increased dissolved oxygen and a reduction in the likelihood of algae blooms. The delivery of 741 GL of Commonwealth environmental water to the River Murray contributed to maintaining salinity levels below target levels.

Mid-Murray River floodplain
Real time water quality information relating to the management of dissolved oxygen within the floodplain forest area of the mid-Murray region is regularly discussed within operational advisory groups, facilitated by the Murray-Darling Basin Authority river operators, during periods of active water delivery and data accessed through state-based websites for on-going operational monitoring. Contingency plans were in place during the year to enable timely response to water quality issues (dissolved oxygen) if required.

14.2.3. Case study

Response

In 2014–15, Commonwealth environmental water continued to contribute to the achievement of these water quality targets. For example, over the last three years environmental water has been used in the lower Broken Creek to maintain dissolved oxygen levels above tolerable levels for biota, support fish movement and condition and provide continuous flow through to the River Murray. This involved Commonwealth environmental water delivery of 41.2 GL in 2012–13, 38.6 GL in 2013–14 and 32.6 GL in 2014–15, and 1.7 GL of Victorian environmental water in 2014–15.

Approximately 90 per cent of Commonwealth environmental water delivered to lower Broken Creek in 2012–15 was returned to the River Murray, contributing to environmental outcomes in the lower Murray including the Lower Lakes, Coorong and Murray Mouth.

Water quality monitoring in lower Broken Creek and environmental response modelling undertaken during 2012–14 provides strong evidence that in the absence of these environmental flows, dissolved oxygen concentration in the Rices Weir pool would have been dangerously low for extended periods, and well below the Australian and New Zealand Environment and Conservation Council water quality guidelines for aquatic ecosystems. Without this environmental water, the rapid and sustained depletion of dissolved oxygen is likely to have resulted in critical conditions (risk of hypoxic blackwater and fish kills) in lower Broken Creek.

Response

Managing salinity within the Coorong and Lower Lakes
An overall objective for water-dependent ecosystems under the Basin Plan is for the Murray Mouth to remain open at frequencies, for durations and with passing flows sufficient to convey salt from the Murray-Darling Basin into the ocean. Over the last three years, Commonwealth environmental water has contributed 100% of the barrage flows to the Coorong between November and May. These flows have contributed to keeping the Murray Mouth open, allowing the export of salt from the Basin, and reducing the salinity in the Coorong's North Lagoon. The volume of salt flushed from the River Murray system into the sea through barrage releases is monitored under the Long Term Intervention Monitoring for the Lower Murray.

Hydrological modelling was frequently undertaken during 2014–15 to evaluate the potential effect of environmental water delivery scenarios on water quality within the Lower Lakes and Coorong. This information was used to support recommendations for environmental water use approval and active management during delivery. Modelling provided in December 2014 identified a high probability of salinity within the South Lagoon exceeding critical thresholds (average salinity of >100 g/L) in the following months. Additional environmental water was made available by the Commonwealth Environmental Water Holder to support increased barrage flows into the Coorong in response to this water quality risk.