

Matter 14 - Report on Managing Water Quality and Salinity – NSW

The NSW 2014–15 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 having regard to water quality and salinity targets when managing water flows (**14.1**)
- Governments 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 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

NSW is in the process of developing Water Quality Management Plans that will demonstrate detailed procedures and tools required for having regard for the targets in s9.14 when managing water flows. Current procedures and tools to enable meeting water quality targets for dissolved oxygen (DO), recreational water quality and salinity are:

s9.14 a) to maintain dissolved oxygen at a target value of at least 50% saturation

- NSW operates a network of DO early warning sensors in the Murray and Riverina regions. Information from these sensors is disseminated weekly during high risk times and management options discussed by multi-agency river operation groups when a warning for a potential low DO or blackwater event is triggered.

- Physical monitoring of DO occurs routinely in all New South Wales Murray-Darling Basin catchments, with the potential to monitor key water flow events as required during high risk times.

s9.14 b) the targets for recreational water quality in s9.18

- In NSW, the State Algae Advisory Group, the Technical Advisory Group and the six Regional Algal Co-ordinating Committees within the Murray-Darling Basin are coordinated under the New South Wales Algal Risk Management Framework.

- Managing the risk of algal blooms in NSW fresh waters includes a multi-agency co-ordinated algal monitoring program, management of blooms and the release of public notifications. Algal warning levels are for recreational water use as set out in the Australian Guidelines for Managing Risks in Recreational Water.

s9.14 c) the levels of salinity at the reporting sites set out in the following table should not exceed the values set out in the table, 95% of the time.

- NSW continuously monitors river salinity at a number of key locations within the Murray-Darling Basin.

- Modelling tools support salinity management by enabling assessment of salinity regimes under a 'stationary' water management regime, enabling different management options to be explored and evaluated, or to allow the extrapolation of salinity into the future or into geographic areas where there is little data available.

- NSW adheres to its obligations under the Basin Salinity Management Strategy by remaining a positive balance on the salinity registers, and to maintain the Basin salinity targets in the Murray-Darling Basin Agreement for salinity planning and management.

- The Murray-Darling Basin Authority (MDBA), Basin Officials Committee and Basin States undertake long-term salinity planning and management functions in accordance with the targets in Appendix 1 of Schedule B, including the Basin Salinity Management Strategy Operational Protocols.

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

Response

NSW undertakes routine state-wide river water quality monitoring at key locations across all catchments of the NSW Murray-Darling Basin; this includes the capture and characterisation of rivers and streams in terms of long-term physical and chemical features.

Existing operational governance structures are in place to inform water management in NSW. Water Sharing Plans for regulated rivers that have an Environmental Contingency Allowance have water set aside for environmental flows to help manage poor water quality events. Further development of Monitoring and Evaluation Plans is currently under way to allow greater regard for the water quality targets in Chapter 9 of the Basin Plan.

14.1.3. Case study

Response

Blue-green algae blooms have been a major problem in the regulated Murray Darling Basin. Some species of blue-green algae can produce a range of toxins which have been linked to human illness and stock losses. When toxin producing algae reach high concentrations the water can no longer be used for stock watering or recreation and drinking water must be treated to remove toxins, which is costly.

Low flows and stable water conditions can lead to thermal stratification of water bodies promoting the growth of blue-green algae. Blooms are often worst during summer months when temperatures are high and thermal stratification strong. Associated effects of blooms include reductions in dissolved oxygen concentrations in bottom layers.

An example of this is in the Lower Darling River downstream of Menindee Lakes where blooms of toxic blue-green algae have occurred in the past. Rules have been introduced into the Water Sharing Plan for the New South Wales Murray and Lower Darling Regulated Rivers Water Sources (2004) that direct how the environmental water allowance can be used. When a high blue-green algal alert has been declared under the Sunraysia Regional Algal Contingency Strategy, water from the reserve can be used to disrupt stratification.

14.2: Making decisions about using environmental water with regard to water quality targets (s9.14)

14.2.1. What procedures and tools were in place to enable water quality targets to be met?

Response

NSW environmental water (EW) events seek to maximise environmental outcomes whilst having regard to the Basin Plan's water quality and salinity targets. All approvals for EW releases need to demonstrate adequate risk identification and mitigation, and have regard to the targets in s9.14, as prescribed in Form A (Request to deliver environmental water). Where possible, modelling is used to assess potential water quality impacts of proposed water actions (e.g. bank erosion, blackwater, acid sulphate soils, salinity, DO and temperature). The delivery strategy is developed with regard to water quality and salinity targets. Additionally, risk mitigation strategies are developed to address potential water quality impacts and salinity issues that may occur during the delivery of

environmental water. These may include cessation of water delivery, changes to the timing, duration or inundation extent of the environmental water delivery, or use of dilution flows.

14.2.2. Statement that procedures and tools were used to meet water quality targets

Response

Risk assessments, monitoring, and mitigation actions were undertaken for all NSW EW events in 2014/2015. Prior to the release of environmental flows, relevant infrastructure managers were consulted, and throughout the course of watering events, regular phone calls, email updates, and site inspections with stakeholders and landholders were carried out to keep them informed and mitigate any concerns.

In the event of any changes in water quality, there was appropriate communication with scientists, government, and the community in order to implement appropriate mitigation strategies. Climatic changes were also monitored and watering adjusted accordingly in order to minimise impacts of flood water. All 2014/2015 environmental watering events in NSW were completed with the approval and support of the community, landholders, stakeholders and relevant government departments, and with positive environmental outcomes.

14.2.3. Case study

Response

In 2014/15, an EW event was planned to deliver up to 360 ML of NSW AEW into Thule Creek from the Murray Irrigation Escape, as part of the Koondrook-Perricoota Forest Flood Enhancement Scheme. Prior to the event, a small amount of hypoxic blackwater (1.4mg/litre) leaked through the new Thule Creek Regulator. The hypoxic water was less than 200 metres from a permanent pool believed to be inhabited by native fish and was identified as a potential risk for causing fish kills in Thule Creek.

Approximately 250 ML from the Koondrook-Perricoota Commissioning Flow was being held behind the new Thule Creek Regulator with DO level of 5.2mg/litre. There was concern that if this water was released to assist with the dilution this would push the hypoxic water into the permanent pool and potentially cause fish kills in Thule Creek.

NSW worked closely with the Murray Lower Darling EWAG, Koondrook-Perricoota Operating Committee, Wakool Shire Council and Thule Creek landholders to investigate potential risks of releasing the Koondrook-Perricoota Commissioning Flow to assist in diluting the pool. During this process, risk mitigation strategies were developed (Form A) to address potential water quality issues (DO) that may occur during the delivery of the environmental water.

After investigation and discussions between stakeholders it was proposed that the permanent pool was large enough and the flow of hypoxic water was low enough that the risk of hypoxia occurring

in the permanent pool was minimal. Therefore, the release could proceed because the event would have positive outcomes and flows within Thule Creek would provide sufficient dilution. In addition, it was proposed that the delivery of the water would assist NSW to better understand the Thule Escape capacity and if the escape could be used for hypoxic water mitigation during future Koondrook-Perricoota events.

To minimise risks during the watering event, DO was monitored closely and this information was communicated with involved parties. Because of the risk mitigation and management systems in place, and effective communication strategies, significant impacts to water quality were prevented. As a result, this watering event was successful in achieving the desired environmental outcomes and all parties involved were satisfied with the results. In addition, NSW learnt that the escape could potentially be used for hypoxic water mitigation during future Koondrook-Perricoota events.