Report on Managing Water Quality and Salinity – South Australia

The South Australian 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

SA has a comprehensive natural resource management legislative framework (including the *Natural Resource Management Act 2004, River Murray Act 2003* and the *Environmental Protection Act 1993*) under which the State operates to maintain water quality. Salinity outcomes in South Australia are also dependent on river operation decisions made by the Murray-Darling Basin Authority (MDBA).

The following plans, guidelines and tools have been developed, reviewed and updated to consider water quality targets outlined in s. 9.14 of the Basin Plan when managing water flows in South Australia:

- South Australian River Murray Annual Operating Plan
- Annual Environmental Watering Plan
- Water/Wastewater Incident Notification and Communication Protocol
- Salt Disposal Plans
- Wetland Management Plans
- River Murray Action Request Forms
- Guidelines for Having Regard to Targets for Managing Water Flows
- Modelling and decision templates
- Monitoring

The Department of Environment, Water and Natural Resources (DEWNR), along with SA Water, routinely collect and report on water quality data in the River Murray to support and inform water management decisions.

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

Response

South Australia uses the procedures and tools described in 14.1.1 to meet water quality targets.

In 2014-15, flow management decisions were made on a daily basis by the Department of Environment, Water and Natural Resources (DEWNR) River Murray Operations Group guided by the relevant plans, guidelines and tools including South Australian River Murray Annual Operating Plan and Annual Environmental Watering Plan. Decisions were made using a range of hydrological data, modelling and other information gathered regularly.

Oversight of decisions is provided by a defined governance structure. A multi-agency River Murray Operations Working Group meets monthly to review status and provide guidance to the River Murray Operations Group on issues that arise throughout the year. Any material salinity and water quality issues identified that cannot be resolved are elevated to a DEWNR senior officials Murray-Darling Basin Coordinating Committee (MDBCC).

Regular monthly reporting on River Murray operations and flow and water quality outcomes is provided to the MDBCC. All plans (including the SA River Murray Annual Operating Plan and the Annual Environmental Watering Plan) and significant policy and operational decisions relating to the River Murray that may have an impact on water quality standards are assessed and approved by MDBCC before implementation.

River Murray operations outside of the defined South Australian River Murray Annual Operating Plan and the Annual Environmental Watering Plan are managed through River Murray Action Request Forms. River Murray Action Request Forms require the proponent to identify the potential impacts of flow management decisions as they relate to water quality for actions that arise throughout the year.

In 2014-15, thirty River Murray Action Request Forms relating to flow management and wetland management were received for consideration and assessed for impacts on River Murray water quality or other users. Where potential implications for water quality are identified proponents are required to identify potential mitigation strategies and monitor outcomes.

14.1.3. Case study

Response

In 2014-15, South Australia had regard to water quality targets in the delivery of all regulated water entitlements (entitlement flow, trades and environmental water) to South Australia. The Basin Plan targets for managing water flows were included in the South Australian River Murray Annual Operating Plan as part of the implementation of the Basin Plan in South Australia. Under the Operating Plan, when undertaking actions that may affect water quality, the following requirements are considered:

1. That the flow decision is consistent with relevant operational and environmental watering plans and policies including:
   - South Australian Annual Environmental Watering Plan/Priorities
   - MDBA Annual Operating Plan
   - BOC Objectives and Outcomes for River Operations in the River Murray System;

2. If there is a high possibility that the flow decision may result in either salinity, dissolved oxygen or cyanobacteria exceeding target values, a risk assessment should be undertaken which considers:
   - potential impacts from the water flow decision
   - current in-stream conditions (including upstream of the South Australian border)
   - forecast flow conditions
   - available mitigation strategies;

3. The need to undertake monitoring and evaluation of the implementation of the flow management decision to assess actual changes to relevant water quality parameters (before and after using existing or event based monitoring) and to determine long-term trends;

4. Completing relevant notification requirements. This may include:
   - a River Murray Action Request form
   - community notification through appropriate channels when required;

5. Putting in place appropriate reporting arrangements, including:
   - documentation of decision making process and how targets for managing water flows (9.14) were considered; and processes to allow provision of monitoring information and documentation.

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

SA has a comprehensive natural resource management legislative framework (including the *Natural Resource Management Act 2004, River Murray Act 2003* and the *Environmental Protection Act 1993*) under which the State operates to maintain water quality. Salinity outcomes in South Australia are also dependent on river operation decisions made by the Murray-Darling Basin Authority (MDBA).

As outlined above, the following were used to ensure that regard is had to the targets in s9.14 when making decisions about the use of environmental water in South Australia:

- South Australian River Murray Annual Operating Plan
- Annual Environmental Watering Plan
- Water/Wastewater Incident Notification and Communication Protocol
- Salt Disposal Plans
- Wetland Management Plans
- River Murray Action Request Forms
- Guidelines for Having Regard to Targets for Managing Water Flows
- Modelling and decision templates
- Monitoring

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

Response

As noted in responses above the South Australian Government applies a range of procedures and tools to manage water flows and use environmental water with regard to water quality targets.

To ensure that regard is had to the targets for managing water flow when planning and delivering environmental water South Australia uses an adapted 'The Living Murray' (TLM) template that considers the risks with both not watering and watering wetlands. The template assists working groups in their decision making processes relating to development, planning and use of environmental water to make an assessment against the targets listed under s 9.14.

Environmental water managers are also involved in the River Murray Operations Working Group which meets monthly to review status and provide guidance to the DEWNR River Murray Operations Group on issues that arise throughout the year. Decisions to use environmental water are dependent on the real-time river conditions at the time, the perceived risks and available contingency measures.

During watering events specific monitoring of water quality occurs in real-time at the major wetland sites. Smaller sites are monitored through the in-stream monitoring network. Data is available in real-time to the DEWNR River Murray Operations Group who manage river operations.

South Australia also participates in the MDBA operations led advisory group for environmental watering and the information provided about water quality from that group is also used in real-time operational decisions.

Environmental watering actions that arose throughout the year outside of the agreed SA River Murray Annual Operating Plan and the planned Annual Environmental Watering priorities were recorded using a River Murray Action Request Form. In 2014-15 30 requests relating to wetland management were submitted.

14.2.3. Case study

Response

The Chowilla floodplain is one of the six icon sites under The Living Murray (TLM) program. The floodplain is underlain by a shallow highly saline aquifer and is a source of saline groundwater discharge into the River Murray.

Managed inundation of the floodplain via operation of the Chowilla environmental regulator will reduce soil salinity, thereby improving vegetation health and providing an environmental benefit to the Chowilla region. However, it may also result in discharge of salt into the Chowilla Creek and ultimately to the River Murray.

Significant work to assess and model both long term and short term salinity impacts associated with operation of the Chowilla regulator structures has been undertaken. The information from the salinity assessments has informed the development of an operating strategy for the regulator which includes actions to mitigate any salinity risks associated with operation through adaptive management of the operational extent, duration and rate of drawdown.

Initial testing of the regulator and ancillary structures was undertaken during spring 2014 and provided an opportunity to commence validation of the modelled salinity impacts and assess risk mitigation measures. The testing involved mid-level operation of the Chowilla regulator resulting in a floodplain inundation of approximately 2,300 hectares of wetlands and floodplains.

Operation of the Chowilla Creek Regulator and ancillary structures was managed in accordance with the governance arrangements specified in the operating plan. A Chowilla Operations Group was established to oversee the event and was responsible for the day-to-day real-time management.

Risk assessments were undertaken to understand, and enable planning for the minimisation and management of risks and an extensive network of telemetered monitoring stations was established. The information collected from monitoring stations was considered by the Chowilla Operations Group to ensure operations were managed to maintain water quality within acceptable limits.

Monitoring showed only a slight increase in salinity (20 EC) in the River Murray during, and on recession of the testing event. This increase in salinity is similar to the typical background increase in salinity downstream of Chowilla Creek in the Murray River, and the salinity levels recorded during and following the testing are relatively low in comparison to averages recorded over previous 12 months.