Australian Government

MURRAY–DARLING BASIN AUTHORITY

Assessment of the salt export objective and salinity targets for flow management 2016–17

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Acknowledgement of the Traditional Owners of the Murray–Darling Basin

The Murray–Darling Basin Authority acknowledges and pays respect to the Traditional Owners, and their Nations, of the Murray–Darling Basin, who have a deep cultural, social, environmental, spiritual and economic connection to their lands and waters. The MDBA understands the need for recognition of Traditional Owner knowledge and cultural values in natural resource management associated with the Basin.

The approach of Traditional Owners to caring for the natural landscape, including water, can be expressed in the words of the Northern Basin Aboriginal Nations Board:

> …As the First Nations peoples (Traditional Owners) we are the knowledge holders, connected to Country and with the cultural authority to share our knowledge. We offer perspectives to balance and challenge other voices and viewpoints. We aspire to owning and managing water to protect our totemic obligations, to carry out our way of life, and to teach our younger generations to maintain our connections and heritage through our law and customs. When Country is happy, our spirits are happy.

The use of terms 'Aboriginal' and 'Indigenous' reflects usage in different communities within the Murray–Darling Basin.

Cover image: River Murray salinity monitoring pontoon near Mildura (photo by Asitha Katupitiya).

Salinity management across the Murray–Darling Basin is a significant challenge. If not managed well, salinity poses an ongoing risk to the Basin's land and water resources. While salt occurs naturally in the Basin's landscape, activities such as irrigation development and land clearing can cause salts to concentrate in certain places. Water flowing through the River Murray system and out to the Southern Ocean through the Murray Mouth is the only natural means by which salt can leave the Basin.

Salt export objective

The Basin Plan includes a salt export objective to ensure that salt is flushed at a sufficient rate into the Southern Ocean from the River Murray system. The Murray–Darling Basin Authority assesses achievement of the salt export objective by estimating the number of tonnes of salt exported per year averaged over the preceding three years. This is then compared with the Basin Plan indicative figure of 2 million tonnes per year.

The estimated annualised rate of salt export over the barrages was 0.87 million tonnes (Figure 1) during the three year assessment period (July 2014–June 2017). This is less than the Basin Plan's indicative figure of 2 million tonnes per year.

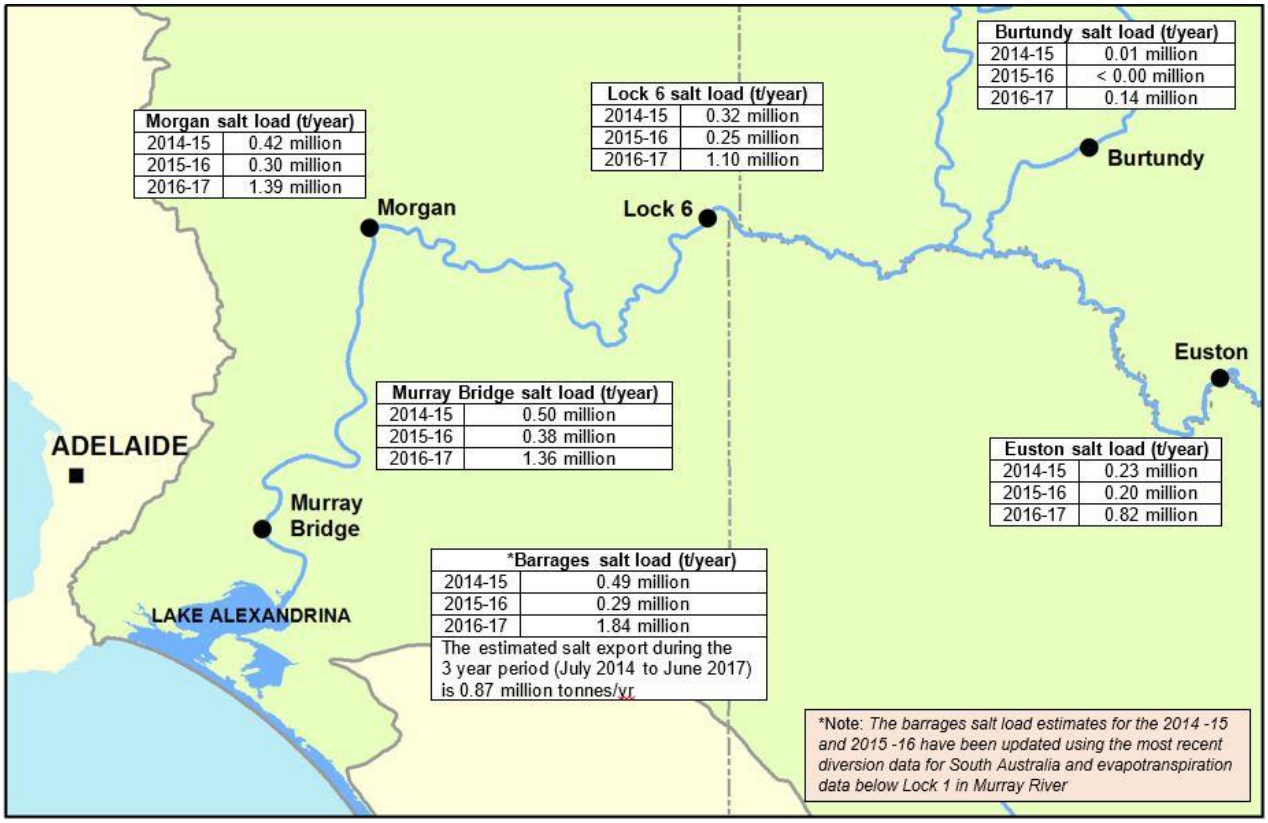

Figure 1: Salt loads at key locations in the Murray–Darling Basin

It has not been possible to consistently export large quantities of salt over the barrages as two of the three years over which the assessment was run were low flow years in the Basin. The third year, 2016-17, the estimated salt exported over the barrages increased significantly to 1.84 million tonnes, as a result of the 2016 flood event.

A range of factors influence how much salt is exported each year. These include river regulation, changed land management practices, complex groundwater systems and the highly

variable nature of the hydrological conditions in the Basin. It may not be possible to flush 2 million tonnes of salt consistently while maintaining salt concentration or the salinity levels in the river at acceptable levels

During periods of low flows, preventing salt entering the river is more important than exporting salt to the ocean. Salt interception schemes (SIS), built over the past three decades to protect the shared water resources in the river play an important role during these periods by diverting salt away from the River Murray system. In dry years, the SIS divert more salt (approximately 500,000 tonnes) away from the river and adjacent landscapes. During periods of higher flow, such as those experienced during late 2016, SIS play less of a role in reducing river salinity as there is greater dilution and more salt is exported. As 2016-17 was a wet year, SIS only diverted about 395,000 tonnes of salt away from the river and adjacent landscapes (Table 1).

Table 1: Estimated salt export over the barrages and salt diverted away from the river system by salt interception schemes

Variable	2014–15 reporting year	2015–16 reporting year	2016–17 reporting year
Salt diverted away from the river and adjacent landscapes through operations of SIS (tonnes/year)	432,000	525,000	395,000
Estimated salt export over the lower lake barrages (annualised average over the three proceeding years – tonnes/year)	0.9 million	0.56 million	0.87 million

The achievement of the salt export objective should therefore be viewed in the wider context of overall salinity management including all the measures implemented in the Basin over the last three decades. It is anticipated that the increased flows resulting from the Basin Plan will assist to flush salts from the Basin and particularly the River Murray system overtime.

Salinity targets for flow management

The Basin Plan also includes salinity targets for flow management (operational targets) at five reporting sites. These targets seek to ensure that River Murray water is suitable for drinking, agriculture, recreation and the environment.

The salinity has been continuously monitored at the five reporting sites Lock 6, Morgan, Murray Bridge, Milang and Burtundy over the five-year reporting period (2012–17). The targets are deemed to have been met if the percentage of days above the target is less than 5%, or the salinity has been below the target value for 95% of the time.

Results for July 2012–June 2017 (Table 2) show that the salinity target values were achieved at four of the five reporting sites – Murray Bridge, Morgan, Lock 6 and Milang.

Over the reporting period, the salinity at Burtundy was above the target value for 36% of days. A dry period, between mid-2014 and mid-2016, in the Darling River system led to low flows in the lower Darling, downstream of Menindee Lakes, resulting in over 1,500 EC salinity at Burtundy from early March to mid-August in 2016. The lack of water available from Menindee Lakes made it difficult to take actions to effectively manage salinity in the lower Darling River.

Table 2: Salinity levels at the reporting sites over the five-year period from 1 July 2012 to 30 June 2017, compared to the target values in Basin Plan (section 9.14)

Reporting site	Target value (EC in µS/cm)	Non-exceedance salinity at 95% of the time (µS/cm)*	% of days above the target value
River Murray at Murray Bridge	830	563	0
River Murray at Morgan	800	520	0
River Murray at Lock 6	580	363	0
Darling River downstream of Menindee Lakes at Burtundy	830	1,620	36
Lower Lakes at Milang	1,000	877	0

*Salinity values compiled from best available data (daily mean values derived from continuously logged data).
EC is an electrical conductivity unit commonly used to indicate salt concentration or the salinity of water.