SA River Murray Flow Report

Government of South Australia
Department for Environment and Water

Report #04/2023

Issued 1:00 pm 27 January 2023

This supersedes the previous Flow Report issued by the Department for Environment and Water (DEW) on 20 January 2023. The next Flow Report will be provided on Friday 3 February 2023.

Current and forecast water levels

High flows continue to pass through the length of the River Murray in SA and the Lower Lakes. As advised previously, wind speed and direction play a significant role in daily water levels recorded in the lower section of the River Murray in SA. This means that it is possible that higher water levels may still be observed even though the peak flow has passed.

The table below shows current water levels at key points along the river system and when river levels are expected to recede to below minor flood levels. River users should note that differences will be observed between the rate of rise and the rate of fall during this flood event.

Location	Normal Pool Level (m AHD)	Current level at 27/01/23 (m AHD)	Minor flood level (m AHD)	Estimated date range for river levels falling below minor flood level	Highest water level during 2022-23 flood (m AHD)
Lock 6	19.25	20.43	-	-	21.32
Renmark Pump Stn	16.30	18.18 (25/1/23)	-	-	19.04
Lock 5		17.56	17.1	30 Jan – 5 Feb	18.65
Lyrup	13.20	16.53	16.1	31 Jan – 6 Feb	17.54
Berri		15.73	15.5	2 – 8 February	16.50
Lock 4		15.04	-	-	15.90
Loxton	9.80	14.28	13.9	3 – 9 February	15.35
Cobdogla		13.04 (25/1/23)	-	-	14.34 (est.)
Lock 3		12.68	-	-	13.99
Overland Corner	6.10	12.32	11.3	5 – 11 February	13.58
Waikerie		-	-	-	12.06
Lock 2		10.08	-	-	11.18
Morgan	3.20	8.52	-	-	9.62
Lock 1		6.55	3.7	10 – 17 February	7.54
Swan Reach	0.75	5.68	2.6		6.99
Walker Flat		4.47	1.8		5.26
Mannum PS		2.80	1.2		3.29*
Murray Bridge		1.99	1.2		2.34*
Wellington		1.24	-	-	1.74*
Meningie (Lake Albert)		Varying 1.10 *	1.8	Remain below minor flood level	1.20*
Milang (Lake Alexandrina)		Varying	1.3	**	1.40*

		1.12*			
Clayton Bay (Lake Alexandrina)		Varying 1.00*	-	-	1.16*
Goolwa & Hindmarsh Island marina (Lake Alexandrina)		Varying 0.71*	1.6	Remain below minor flood level	0.99*

**Wind and/or tide affected*

*** There remains a possibility of water levels exceeding the minor flood level for short periods due to weather and/or tide conditions until the end of January 2023.*

Notes

Gigalitre (GL) = 1,000,000,000 litres

mAHD = elevation in metres above Australian Height Datum (approximately equivalent to sea level)

Some things to consider –

- These updated flow and height tables should be used in conjunction with other information sources available at sa.gov.au/floods
- Maps which model potential inundation at various flood levels are available here.
- The locations included in the table have been chosen because they are monitored sites (either current or historical).
- This is the first time in nearly 70 years that River Murray flows have reached many areas of the landscape and it is almost certain that changes to the river channel and floodplain in that time will lead to unforeseen and unexpected difference in flood behaviour. For example, it is possible that the flood this year will look different to pictures you have from the past – even with water flows at similar levels to past events.
- Some of the things that can impact flood behaviour include:
  - Floodplains – Changes on the floodplain will impact how far floodwaters spread, how they soak in and how water returns to the river
  - Bathymetry – Changes to the depth of the river channel due to increased sedimentation or scouring
  - Vegetation – Changes in vegetation density as a result of changes in grazing pressure
  - Infrastructure – New infrastructure like roads, buildings, levees
  - Wind – Wind can cause changes in flood behaviour, especially in the Lower Murray
  - Weather conditions – Rainfall across the border

Peak water level and flow

While the peak flow has since passed through the length of the River Murray in South Australia water levels remain elevated. In the Lower Lakes water levels may yet rise again as a result of tide and weather conditions.

The adjusted peak flow at the border was around 190 GL/day, taking into account on-ground measurements of flow during this flood event, which aligns with the forecast flow range of 190 – 220 GL/day. The calculated flow at the border has now fallen below 100 GL/day and today is approximately 95 GL/day at the border and is falling quickly. This is a reduction of over 90 GL/day since it peaked on 23 December 2022.

A rapid flow recession is occurring throughout the Southern Connected Basin consistent with the recession pattern observed following a number of previous high flow events in the River Murray.

The most recent modelling predicts that the flow at the border will fall to approximately 45 GL/day during the week 3 – 10 February. **This is a steeper rate of fall than has been experienced up until this point and water users should take care and regularly check their boat moorings to make the necessary adjustments.**

The flow at Lock 1 is expected to fall to 100 GL/day sometime around 10 February and continue to fall rapidly to 60 GL/day within the following week.

It is important to recognise that even after the river flow has returned to the main channel (at around 40 GL/day – currently forecast to occur during February), many low lying areas of the floodplain will remain inundated for an extended period.

The Bureau of Meterology has advised that the current and predicted flows in the Darling River are not likely to cause significant river level rises at Wentworth. Based on the current forecast, Darling River flow entering the River Murray at Wentworth is expected soon and predicted to be in the order of 12 GL/day higher than the steady inflow seen over the last few months. Some additional flow is also expected to occur via the Great Darling Anabranch which enters the River Murray downstream of Wentworth. The peak flow down the Anabranch is currently predicted to be less than 5 GL/day, noting that travel time for flow in the Anabranch is several weeks longer than the main stem of the Darling River between Menindee Lakes and the Murray. Based on these predictions, the arrival of the Darling River flood peak is forecast to only result in a "flattening" of the flow recession and not a second flood peak in the Murray.

Lake Bonney inlet re-opening

River users should be aware that the re-opening of the inlet to Lake Bonney is likely to result in short term increase in salinity levels in the River downstream of the lake. This is common during flood recessions and is a result of the normally higher salinity water held in Lake Bonney being drawn into the river with falling water levels. Modelling undertaken by DEW has indicated that salinity in the River channel should stay within limits for consumptive use. However, there are a number of factors which could influence the volume and timing of saltier water entering the main river channel, including the amount of mixing that occurs between fresher and saltier water within Lake Bonney upon re-opening, and the actual rate at which water levels fall in the river compared to what has been predicted. Downstream irrigators are encouraged to monitor the daily salinity levels provided by SA Water as part of their business operations.

Barrage operations and water levels in the Lower Lakes

The water level in Lake Alexandrina is approximately 1.07 m AHD and Lake Albert is approximately 1.10 m AHD.

As of Friday 2 December 2022, all operational gates across all 5 barrages were opened and will remain constantly open for the next few months to pass the floodwaters, even during storm events. Fishways at all barrages and at Hunters Creek (11 in total) were also open during the entire week to provide fish passage between the Coorong and Lower Lakes.

Barrage releases are normally calculated using water levels from upstream and downstream of the barrages which are entered into equations to determine the volume of flow through each of the five barrages and the fishways. The existing methodology for calculating barrage releases is not accurate with the very high flow and water levels currently being experienced. Analysis will be undertaken following the flood event to develop a flow record of barrage releases throughout the flood.

Wind and tide conditions and elevated water levels downstream of some barrages have continued to constrain barrage releases in recent weeks, which has kept water levels higher than planned in the Lower Lakes.

Landholders and communities in the Lake Alexandrina region, particularly between Loveday Bay and Narrung Peninsula and in the vicinity of Goolwa, Hindmarsh Island and Mundoo Islands, are advised that short-term salinity increases are possible over the next few weeks due to flood-related barrage operations.

While the high volume of fresh water entering the Coorong estuary from the River Murray means the water downstream of the barrages is much fresher than usual, there is a small chance that saltier water will enter Lake Alexandrina for short periods from high tides or storms. Residents pumping water from the Lower Lakes are advised to check real-time salinity data here: https://water.data.sa.gov.au/

Over the coming weeks it is possible that wind, tides and wave action may temporarily result in higher levels in some locations. This local weather based variation is consistent with the variation seen on the Lakes outside of the current event.

Water levels and barrage operations are monitored closely by the South Australian Government, Murray-Darling Basin Authority and Commonwealth Environmental Water Office.

Murray Mouth

Bathymetric survey of the width and depth of the Murray mouth in the last two weeks has shown that the mouth is continuing to scour as a result of the high flows, which will assist in increasing the volume of water that is able to be released from the barrages. A wider and deeper Murray Mouth will have positive environmental benefits following the flood through enabling better exchange of water between the ocean and the Murray estuary and Coorong.

River Murray River Vessel Waste Disposal Stations

As flow to South Australia remains high, all river vessel waste disposal stations are offline with the exception of Goolwa which remains operational.

These proactive and preventative measures are required to minimise risks to public safety and water quality and ensure infrastructure is protected. The temporary closure of this infrastructure is to ensure that when the flows do recede to safer levels, the systems can go back online in a timely manner.

In the interim, commercial options are available for businesses to utilise temporarily at houseboat owners and operators' expense while the disposal stations are closed.

If you have any questions, please contact the DEW Engagement Team on DEW.WIOCommunications@sa.gov.au

Levee embankments

All levee banks along the Lower Murray from Mannum to Wellington are now closed in accordance with *Emergency Management (River Murray) (No 1) Direction 2023* which came into effect at 12:01 am Wednesday 4 January 2023.

Any Local Irrigation Trust members and contractors still accessing the levees for emergency response or maintenance works are encouraged to take all necessary precautions when working on the levees, particularly during or following wet weather.

If you have any questions, contact the DEW Engagement Team on DEW.WIOCommunications@sa.gov.au

Environmental news

Unregulated flows have been continuous to SA since July 2021 due to wetter than average conditions across much of the Murray-Darling Basin. Apart from small volumes that are delivered as part of SA's entitlement flow or to help manage blackwater from time to time, deliveries of water for the environment are generally on hold until flooding recedes. High flows provide a range of benefits for the environment in SA, including:

- connecting the river with floodplains and wetlands, inundating areas that have been dry for many years;
- allowing fish dispersal and movement into new habitats and throughout the Murray-Darling Basin;
- providing 'flowing water habitat' to benefit native fish, animals, and plants in the River Murray channel that have adapted to a riverine environment, including supporting spawning and recruitment of large native fish. Golden perch have been detected spawning in the South Australian Murray in recent weeks;
- improving water quality and productivity in the Coorong, providing a food-rich environment for fish and birds including healthy populations of keystone native plant *Ruppia tuberosa*;
- providing habitat for birds, frogs and threatened small-bodied native fish species in the Lower Lakes;
- removing excess salt from the River Murray.

Blackwater

Blackwater occurs naturally when floods wash leaves, grass and cropping material off riverbanks and floodplains into waterways. High levels of organic matter in waterways, combined with warm weather, can cause oxygen levels in the water to drop. This is known as hypoxic (low oxygen) blackwater, which can have a blackish colour and a strong, unpleasant smell.

There is currently no hypoxic blackwater present in the South Australian section of the River Murray. There have however been recent reports of low dissolved oxygen levels and blackwater in upstream sections of the river and its tributaries as a result of recent flooding.

PIRSA, with support from DEW, SA Water and the Murray-Darling Basin Authority and other relevant government agencies, continues to closely monitor blackwater events upstream and plan mitigation measures should it reach South Australia.

When dissolved oxygen levels in water drop below critical levels, it can cause fish and crustaceans to die. To report sightings of large numbers of dead or distressed fish, please contact the 24-hour Fishwatch hotline on 1800 065 522.

Marine Safety

Vessel restrictions under the *Emergency Management Act 2004* have been introduced for users of the River Murray during the flood event. Restrictions aim to keep river users safe and protect infrastructure and further details can he found here: https://www.marinesafety.sa.gov.au/river-murray-flood-event-marine-safety-advice

Further information

All information regarding the 2022/23 River Murray flood event (including that of partner agencies) can be accessed via the following link: http://www.sa.gov.au/topics/emergencies-and-safety/river-murray-flood

The Water Data SA website is South Australia's comprehensive water information portal. For real-time data (like salinity, water levels) go to the following page: Water Data SA. Please note that some surface water monitoring stations may be removed as river flow increases and that data will be unavailable for those stations until they are reinstated.

Up-to-date River Murray salinity, flow and water level information can also be accessed at the SA Water and Murray-Darling Basin Authority websites:

- SA Water River Murray info - levels, flows etc.
- Murray-Darling Basin real-time water data

The latest news, information and announcements about the River Murray and Basin Plan are available at River Murray Update.

Details of river height and rainfall information in the River Murray within Victoria and New South Wales are available at the Bureau of Meteorology website:

- Victoria rainfall and river conditions
- NSW rainfall and river conditions

Department for Environment and Water Home page.

ID	RM-Flow-Report-2023 01 27
Classification	Public I2 A2
Issued	27 January 2023
Authority	DEW
Master Document Location	R:\Water Group\RMO\WRO\04 Communications\Flow Advices\2022-23
Managed and Maintained by	Water Infrastructure and Operations Branch
Author	Water Infrastructure and Operations Branch
Reviewer	Director, Water Infrastructure and Operations