

# RIVER MURRAY FLOW REPORT and WATER RESOURCES UPDATE

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Report #44/2016

Issued 10:00 am 18 November 2016

**This supersedes the previous flow report issued by the Department of Environment, Water and Natural Resources (DEWNR) on 11 November 2016. The next report will be provided on Friday 25 November 2016.**

In this report, for ease of representation, large volumes of water are expressed in gigalitres (GL), while smaller volumes are expressed in megalitres (ML). One GL is equal to 1 000 ML.

## WATER ALLOCATIONS AND CARRYOVER

South Australian River Murray water access entitlement holders (Class 3a, 3b, 4, 7 and 8) are being provided with a 100 per cent water allocation in 2016-17. Eligible water access entitlement holders (Class 3a, 3b, 4 and 7) will also have access to private carryover.

## MANAGEMENT OF SOUTH AUSTRALIA'S DEFERRED WATER

The Murray-Darling Basin Authority confirmed that on 1 November 2016, South Australia had 141.7 GL of deferred water held in storage. The table below identifies the storage in which it is held and the purpose.

At 1 September 2016				
Purpose	Lake Victoria (GL)	Hume (GL)	Dartmouth (GL)	Total (GL)
*CHWN	0.0	0.0	82.0	82.0
Private Carryover	0.0	0.0	59.7	59.7
<b>Total</b>	0.0	0.0	141.7	141.7

\*Critical Human Water Needs (CHWN)

Volumes stored are adjusted for net evaporation losses and spills until delivered to South Australia.

South Australia cannot defer water when receiving unregulated flow. However, the State will continue to seek opportunities to defer and store water when conditions allow.

## WATER RESOURCES UPDATE

During October 2016, the total River Murray System inflow was approximately 3 990 GL, which is nearly three times the October long-term average of 1 410 GL. Inflow to Menindee Lakes (from the Darling System) during October 2016 was approximately 500 GL, which is nearly three times the October long-term average of 170 GL.

The flow to South Australia during October 2016 was approximately 1 366 GL, which is well above the October long-term average of approximately 990 GL. The flow comprised:

- 170.5 GL of Entitlement Flow (includes environmental water on SA licence);
- 1 189 GL of unregulated flow; and
- 6 GL of trade into South Australia.



# River Murray Flow Report and Water Resources Update

## STORAGE VOLUMES

Murray-Darling Basin storage volumes

Storage	Full Supply Volume (GL)	16-11-2016 (GL)	16-11-2015 (GL)	Long-term average (end of November) (GL)
Dartmouth	3 856	2 933 (76%)	2 278 (59%)	
Hume	3 003	2 986 (99%)	1 398 (47%)	
Lake Victoria	677	636 (94%)	576 (85%)	
Menindee Lakes	*1 731	1 059 (61%)	83 (5%)	
<b>TOTAL</b>	<b>9 267</b>	<b>7 614 (82%)</b>	<b>4 335 (47%)</b>	<b>7 308 (79%)</b>

\*Menindee Lakes can be surcharged to 2 015 GL

## RAINFALL AND TEMPERATURE OUTLOOK

The latest Bureau of Meteorology weather outlook for November 2016 to January 2017 indicates average rainfall is likely across the Murray-Darling Basin with temperatures above average. The outlook is influenced by a weakening negative Indian Ocean Dipole (IOD) and a neutral ENSO in the Pacific Ocean.

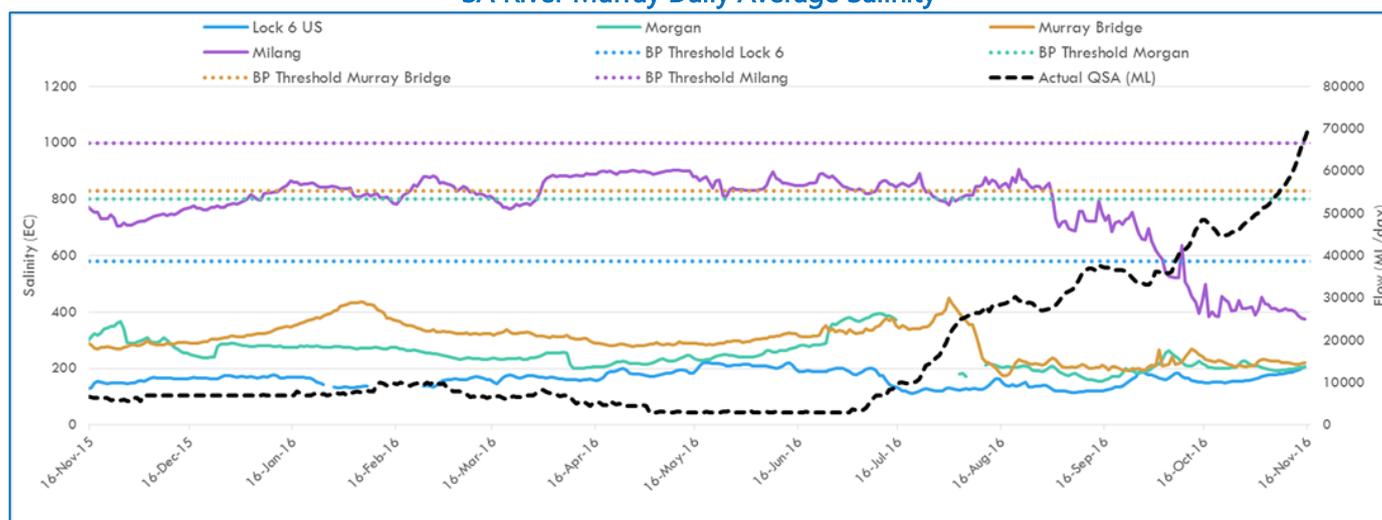
## WATER QUALITY - Salinity

A number of targets are identified under the Basin Plan, which all Basin States must have regard to in managing River Murray flows. The targets for real-time salinity are identified below. Salinity must not exceed these values for 95 per cent of the time:

- 580 EC at Lock 6
- 800 EC at Morgan
- 830 EC at Murray Bridge
- 1 000 EC at Milang

The following graph shows the salinity at these locations and the flow to South Australia (QSA) from November 2015 to November 2016. The dashed-lines identify the Basin Plan (BP) thresholds for the corresponding colour coded location.

SA River Murray Daily Average Salinity



Note: Missing Lock 6 salinity readings from 8-23 February 2016 are due to a faulty EC sensor.  
Missing Morgan salinity readings from 16-11 August 2016 are due to a faulty EC sensor

## FLOW OUTLOOK

The flow at the South Australian border is approximately 78 GL/day and will increase to around 90 GL/day during the coming week. Due to recent rainfall events and flooding across Victoria and New South Wales the flow to South Australia is predicted to increase and peak at around 95 GL/day in late November to early December. The actual peak flow will be dependent on inflows and floodplain consumption upstream of South Australia. For comparison, in 1974 the peak flow at the South Australian border was around 180 GL/day and in 2011 it was around 94 GL/day.

Below is a table of the predicted River Murray water levels at a number of locations from Lock 6 to Murray Bridge under different flow scenarios at the South Australian border. The predicted water levels are based on previous flood events and are provided as a guide only.

Location	River km	Normal Pool Level (m AHD)	Current level at 16/11/2016 (m AHD)	Predicted water level at		
				80 GL/day at SA Border (m AHD)	90 GL/day at SA Border (m AHD)	100 GL/day at SA Border (m AHD)
Lock 6	619.8	19.25	19.54	19.77	19.94	20.28
Renmark	567.4	-	-	16.90	17.34	17.58
Lock 5	562.4	16.30	16.28	16.60	16.90	-
Lyrup	537.8	-	14.59	15.41	15.60	16.00
Berri	525.9	-	14.20	14.80	15.10	15.44
Lock 4	516.2	13.20	13.91	14.30	14.70	14.84
Loxton	489.9	-	12.41	13.30	13.40	13.85
Cobdogla	446.9	-	10.45	10.88	11.50	11.90
Lock 3	431.4	9.80	9.80	10.30	10.90	11.55
Overland Corner	425.9	-	8.69	10.10	10.20	10.65
Waikerie	383.6	-	7.46	8.53	9.00	9.54
Lock 2	362.1	6.10	6.61	7.61	8.20	8.55
Cadell	332.6	-	5.20	6.26	6.75	7.50
Morgan	321.7	-	4.77	5.89	6.15	6.80
Lock 1	274.2	3.20	3.26	3.96	4.20	4.60
Swan Reach	245.0	0.75	1.98	2.79	3.05	# 4.00
Mannum PS	149.8	0.75	1.04	1.33	1.41	# 1.60
Murray Bridge	115.3	0.75	0.87	1.11	1.20	# 1.30

**Note: Water levels (in particular below Lock 1) can be affected by local wind conditions by approximately 0.3 m # Water levels based on limited data**

Now is a great time to enjoy the River Murray at its best. However visitors are reminded to exercise caution at all times when using the river and seek local advice.

The flow to South Australia comprises the normal November Entitlement Flow of 6 GL/day (includes environmental water on SA licence) and unregulated flow.

The flow over Lock 1 is approximately 48 GL/day and will increase to around 65 GL/day during the coming week, depending on weather conditions and extractions.

## River Murray Flow Report and Water Resources Update

It is important to note that flow forecasts in this advice are based on the information available at the time of preparation. Advice may change as new gauging information becomes available, or due to rainfall events or changed operations upstream. The forecasts will be revised as new information becomes available.

### SAND BAGGING

As River Murray flows and water levels continue to increase, there may be minor inundation of some properties on the floodplain. The State Emergency Service (SES) is distributing sandbags to residents, businesses and shack owners from a number of local government locations. If you would like to access sand bags, please call the one of the following councils to find details of how and where to access them:

- Mid Murray Council - call 8540 0060 for collection from Morgan, Blanchetown Mannum or Cambrai
- Rural City of Murray Bridge – call 8539 1100 for collection from Murray Bridge
- Coorong District Council – call 0429 900 919 for collection from Tailem Bend
- Renmark Paringa Council – call 8580 3000 for collection from Renmark
- Berri Barmera Council – call 8582 1922 for collection from Berri or Barmera
- District Council of Loxton Waikerie – call 8584 8040 for collection from Loxton  
- call 8541 0740 for collection from Waikerie

### ENVIRONMENTAL WATER

During November 2016, the Commonwealth Environmental Water Holder and the Murray-Darling Basin Authority's *The Living Murray* are providing environmental water to South Australia. The environmental water will provide in-channel, Lower Lakes and Coorong environmental and water quality benefits.

DEWNR is continuing discussions regarding environmental water to be delivered during 2016-17.

### MURRAY MOUTH

Dredging operations at the Murray Mouth commenced on 9 January 2015 to maintain connectivity (exchange of water) between the Coorong and the Southern Ocean.

The dredging operations combined with recent substantial barrage releases have improved conditions at the Murray Mouth. One dredge is continuing to operate between the Tauwitchere and Goolwa channels. At 13 November 2016 approximately 1 699 500 cubic metres of sand had been removed by dredging operations.

Mariners are advised that there are still a number of shallow zones in and adjacent to the Murray Mouth and should follow all directions in the area and reduce their speed. Boats equipped with echo sounders should regularly check depths and avoid travelling at low tide. Mariners are reminded that navigation through the Murray Mouth is only permitted during daylight hours and that Exclusion Zones established around the dredging operations remain in place to ensure public safety. For more information, refer to the Notice to Mariners at <http://dpti.sa.gov.au/news/?a=247918>

There is also a partial park closure in place for the northern tip of the Coorong National Park. For more information refer to the following [www.environment.sa.gov.au/parks/Safety/Park\\_closures/141219-coorong-national-park](http://www.environment.sa.gov.au/parks/Safety/Park_closures/141219-coorong-national-park). Signage has been installed at appropriate locations advising of Exclusion Zones.

### **BARRAGE OPERATIONS AND WATER LEVELS IN THE LOWER LAKES**

The water level in Lake Alexandrina is approximately 0.81 m AHD and Lake Albert approximately 0.83 m AHD. The difference in water levels is due to wind effects. Water levels are being actively managed to achieve a target water level of 0.8 m AHD at the end of December 2016.

Due to the unregulated flow event, when weather conditions are favourable, water is being released from the barrages into the Coorong. Releases are being prioritised at Tauwitchere, Goolwa, Ewe Island and Mundoo barrages. The primary aims of the releases are to reduce salinity levels in the Lower Lakes and scour sand from the Murray Mouth. All fishways are operational to provide fish passage between Lake Alexandrina and the Coorong.

During the week ending 15 November 2016 total barrage releases were approximately 251 GL.

During adverse weather conditions SA Water will operate the barrages to minimise the risk of seawater entering Lake Alexandrina, therefore minimising any negative salinity impacts from reverse flow events.

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

### **WATER QUALITY - BLACKWATER**

High flows across New South Wales and Victoria have mobilised large amounts of organic matter from the floodplain into the River Murray. The breakdown of organic matter consumes dissolved oxygen, which has led to low levels of oxygen in the water and a dark discolouration - known as blackwater.

The upstream (New South Wales and Victoria) blackwater event has commenced flowing over the South Australian border.

Blackwater events occur naturally but if dissolved oxygen levels drop below critical levels it can cause fish and crustaceans to die. To report sightings of large numbers of dead or distressed fish contact the 24-hour FISHWATCH hotline on 1800 065 522.

DEWNR, SA Water and Murray-Darling Basin Authority with other government agencies are working closely to monitor the situation.

SA Water is monitoring the blackwater event from a drinking water quality perspective and modifying its treatment processes at water treatment plants and throughout its distribution system as required.

SA Health has advised that blackwater is unlikely to cause public health impacts, with the possible exception of skin irritation, which is more likely to occur in sensitive subsets of the population in much the same way as some people are sensitive to certain chemical and materials.

### **WEIR POOL OPERATIONS**

Due to high flows, the River Murray weirs have been temporarily opened (open river conditions). This is a standard operating procedure during periods of high flow. The weirs will be reinstated once the high flows recede.

### LOXTON RIVER VESSEL WASTE DISPOSAL STATION

The Loxton River Vessel Waste Disposal Station was closed on 14 November 2016 and will remain closed until the high flows recede. The remaining 12 waste disposal stations operated by DEWNR will continue to be available for use up to 120 GL/day.

Due to the high flow conditions no alternative waste pumping service is available at Loxton. The nearest river vessel waste disposal stations are at Berri (38 km upstream) or Lock 3 (55 km downstream). For further information, contact Hayden Smith (DEWNR) on 0457 820 553.

### LOWER MURRAY LEVEE EMBANKMENTS

Between Mannum and Wellington there are approximately 118 kilometres of levee banks, of which 67 kilometres are managed and maintained by the South Australian Government.

Recently, the government-managed levee banks have been inspected to assess their condition. A number of localised defects such as settlement, erosion and minor seepage have been identified and are being rectified through earthworks. DEWNR officers have contacted relevant landholders and irrigation trusts about the affected levee banks.

DEWNR has also examined data from a 2010 levee bank survey and identified privately owned levee banks that, unless modified or repaired, adjacent properties could be susceptible to inundation, particularly in the event of severe wind seiche (wind driven water rise, typically caused by southerly wind blowing across Lake Alexandrina). The 2010 Levee Profile Mapping can be accessed through the Water Connect website at [www.waterconnect.sa.gov.au/River-Murray](http://www.waterconnect.sa.gov.au/River-Murray)

An additional survey of levee banks has commenced to measure the current bank crest heights. Information about the outcome of the survey will be provided in future SA River Murray Flow Reports.

Even though levee bank assessments and surveys have been undertaken to identify issues, DEWNR is keen to hear about infrastructure leakages at trust syphons or sluices, and levee bank cracking or subsidence on government-managed levee banks (to confirm that the survey information is complete).

If landholders have specific concerns about the government-managed levee banks they can contact Mr Said Khelwaty, Project Engineer on 0434 076 515 or [said.khelwaty@sa.gov.au](mailto:said.khelwaty@sa.gov.au).

For any general advice or other questions relating to government or privately owned levee banks you can contact Mr Richard Brown, Infrastructure Operations Manager on 0412 046 777 or [richard.brown@sa.gov.au](mailto:richard.brown@sa.gov.au).

### NAVIGATION ISSUES

While this is a great time to visit the river, all visitors are reminded to exercise caution when navigating through the locks and 'opened' weirs, and to be mindful of partially submerged infrastructure such as jetties and floating debris. The higher flow may present a hazard to watercraft with low-horsepower engines.

Sandbars in the vicinity of the Murray Mouth may cause navigation hazards. Mariners are advised to navigate with caution when operating in the area. Sandbars are also present along sections of the River Murray downstream of Locks 7 and 8 and in South Australia. All watercraft users should be aware of the risk of submerged navigation hazards, and should regularly check river depth.

### **RIVER HAZARDS**

Boaters are advised that current and forecast high flow conditions on the River Murray are causing inundation of riverbanks and associated structures.

Some boat launching facilities may become unserviceable due to changed river levels. Bridge clearances will also be reduced by rising water levels. Boaters should exercise caution when operating vessels near to the banks of the river or under bridges, and be aware of structures on, or near, the riverbank which may be submerged. Boaters are also likely to encounter floating debris which may cause damage to vessels or injury to water skiers.

Property owners who are likely to have submerged infrastructure (such as jetties) projecting into the river are reminded to attach a floating marker, coloured Yellow, to the extremity of the infrastructure. This will assist boat users to avoid colliding with the submerged structures.

Persons intending to engage in high speed activities should ensure that the area of water is safe prior to commencing the activity. Vessel wash should be kept to a minimum if operating in the vicinity of inundated houses and other buildings.

For more information, contact Department of Planning, Transport and Infrastructure Marine Operations on 1300 183 046.

# River Murray Flow Report and Water Resources Update

## RIVER MURRAY WATER LEVELS

Below is a table of River Murray water levels at a number of locations from Lock 10 (near Wentworth) to Murray Bridge.

### River Murray Water Levels on 16 November 2016

Location	River km	Normal Pool Level (m AHD)	Current Level (m AHD)	1974 Flood Level (m AHD)	1993 Flood Level (m AHD)	2011 High Water Level (m AHD)
Lock 10	825.0	30.80	32.16	33.81	33.32	32.28
Lock 9 Kulnine	764.8	27.40	28.31	30.03	29.44	28.80
Lock 8 Wangumma	725.7	24.60	-	27.60	27.19	26.79
Lock 7 Rufus River	696.6	22.10	-	25.70	25.24	24.92
Lock 6 Murtho	619.8	19.25	19.54	21.03	20.50	20.11
Renmark	567.4	-	-	18.54	18.04	17.38
Lock 5	562.4	16.30	16.28	18.07	17.50	17.05
Lyrup	537.8	-	14.59	16.85	16.26	15.68
Berri	525.9	-	14.20	15.81	15.74	15.16
Lock 4	516.2	13.20	13.91	15.65	15.08	14.75
Loxton	489.9	-	12.41	15.05	14.12	13.42
Cobdogla	446.9	-	10.45	13.44	12.38	11.52
Lock 3	431.4	9.80	9.80	13.16	12.02	10.93
Overland Corner	425.9	-	8.69	12.73	11.58	10.27
Waikerie	383.6	-	7.46	11.26	10.24	9.06
Lock 2	362.1	6.10	6.61	10.28	9.30	8.25
Cadell	332.6	-	5.20	9.17	8.08	6.82
Morgan	321.7	-	4.77	8.85	7.65	6.20
Lock 1 Blanchetown	274.2	3.20	3.26	6.81	5.38	4.42
Swan Reach	245.0	0.75	1.98	6.06	4.51	3.09
Mannum PS	149.8	0.75	1.04	3.15	1.90	1.46
Murray Bridge	115.3	0.75	0.87	2.06	1.26	1.21

Note that the above water levels may be affected by local wind conditions.

# River Murray Flow Report and Water Resources Update

## FURTHER INFORMATION

The WaterConnect website is South Australia's comprehensive water information portal and can be accessed at [www.waterconnect.sa.gov.au](http://www.waterconnect.sa.gov.au)

Up-to-date River Murray salinity, flow and water level information can be accessed at the Department of Environment, Water and Natural Resources, SA Water and Murray-Darling Basin Authority websites

- [www.environment.sa.gov.au/managing-natural-resources/river-murray/water-allocation-and-trade/water-allocations-and-announcements](http://www.environment.sa.gov.au/managing-natural-resources/river-murray/water-allocation-and-trade/water-allocations-and-announcements)
- [www.waterconnect.sa.gov.au/Systems/RTWD/Pages/Default.aspx](http://www.waterconnect.sa.gov.au/Systems/RTWD/Pages/Default.aspx)
- [www.sawater.com.au/SAWater/Environment/WaterProofingAdelaide/TheRiverMurray/RMOU/Dailyflow.htm](http://www.sawater.com.au/SAWater/Environment/WaterProofingAdelaide/TheRiverMurray/RMOU/Dailyflow.htm)
- <http://livedata.mdba.gov.au/>

The latest news, information and announcements about the River Murray and Basin Plan are available at [River Murray Update](#).

The Department of Environment, Water and Natural Resources has published a series of inundation maps for the River Murray. They are available at [www.waterconnect.sa.gov.au/Systems/RMIM/SitePages/Home.aspx](http://www.waterconnect.sa.gov.au/Systems/RMIM/SitePages/Home.aspx)

Information on the management of acid drainage water in the Lower River Murray can be accessed at [www.epa.sa.gov.au/environmental\\_info/water\\_quality/programs/acid\\_sulfate\\_soils/lower\\_river\\_murray\\_reclaimed\\_irrigation\\_area\\_lmria](http://www.epa.sa.gov.au/environmental_info/water_quality/programs/acid_sulfate_soils/lower_river_murray_reclaimed_irrigation_area_lmria)

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 [www.bom.gov.au/vic/flood](http://www.bom.gov.au/vic/flood)

Information provided by the Commonwealth Environmental Water Office can be accessed at [www.environment.gov.au/ewater/southern/murray/lower-murray.html](http://www.environment.gov.au/ewater/southern/murray/lower-murray.html)

Information on The Living Murray can be accessed at [www.mdba.gov.au/managing-water/environmental-water/delivering-environmental-water/living-murray-program](http://www.mdba.gov.au/managing-water/environmental-water/delivering-environmental-water/living-murray-program)

Chowilla Floodplain Icon Site management [www.environment.sa.gov.au/Chowilla-floodplain](http://www.environment.sa.gov.au/Chowilla-floodplain)

Department of Environment, Water and Natural Resources [www.environment.sa.gov.au/Home](http://www.environment.sa.gov.au/Home)

Information provided by the Department of Planning, Transport and Infrastructure on boat licences, registering motor boats, owning and operating water craft, and boat and marine safety can be accessed at [www.sa.gov.au/boatingmarine](http://www.sa.gov.au/boatingmarine)

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