

# RIVER MURRAY FLOW REPORT and WATER RESOURCES UPDATE

Public I2 A2

Report #10/2016

Issued 10:00 am 18 March 2016

**This supersedes the previous flow report issued by the Department of Environment, Water and Natural Resources (DEWNR) on 11 March 2016. The next flow report will be provided on Thursday 24 March 2016 (due to Easter Public Holiday).**

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 RESOURCES UPDATE

During February 2016, the total River Murray System inflow was approximately 92 GL, which is less than half the February long-term average of 189 GL. Inflow to Menindee Lakes (from the Darling System) during February 2016 was approximately 0 GL, which is well below the February long-term average of 124 GL.

The flow to South Australia during February 2016 was approximately 266 GL, which is well below the February long-term average of approximately 434 GL. The flow comprised:

- approximately 184 GL of Entitlement Flow (194 GL of February Entitlement Flow less 10 GL of deferred Entitlement Flow);
- approximately 80 GL of environmental water from the Commonwealth Environmental Water Holder (CEWH); and
- approximately 2 GL of trade into South Australia.

## STORAGE VOLUMES

Murray-Darling Basin storage volumes at 16 March 2016 and 16 March 2015

Storage	Full Supply Volume (GL)	16-03-2016 (GL)	16-03-2015 (GL)	Long-term average (end of March)
Dartmouth	3 856	1 702 (44%)	3 028 (79%)	
Hume	3 003	875 (29%)	898 (30%)	
Lake Victoria	677	300 (44%)	217 (32%)	
Menindee Lakes	1 731*	**51 (3%)	96 (6%)	
<b>TOTAL</b>	<b>9 267</b>	<b>2 928 (32%)</b>	<b>4 239 (46%)</b>	<b>5 505 (59%)</b>

\*Menindee Lakes can be surcharged to 2 015 GL

\*\*Menindee Lakes are under New South Wales control

## MENINDEE LAKES

Under the Murray-Darling Basin Agreement, the Murray-Darling Basin Authority controls the Menindee Lakes until the stored water volume decreases to 480 GL. The New South Wales Government assumes control of the storage at 480 GL and maintains control until the volume in storage exceeds 640 GL. On 18 February 2014, the volume in the Menindee Lakes dropped to below 480 GL and control switched to the New South Wales Government.

Given that the Menindee Lakes remain under New South Wales control, there is less flexibility in the way water can be delivered to South Australia in 2016, unless the storage position improves significantly.



## RAINFALL AND TEMPERATURE OUTLOOK

The latest Bureau of Meteorology weather outlook for March to May 2016 indicates above average rainfall is likely across the Murray-Darling Basin with temperatures above average. The outlook is influenced by a record warm Indian Ocean and weakening El Niño in the Pacific Ocean.

For the latest forecast on El Niño please refer to the following website:

<http://www.bom.gov.au/climate/enso/>

## 2016-2017 WATER AVAILABILITY OUTLOOK

The Murray-Darling Basin Authority (MDBA) has indicated that South Australia is likely to receive less than its full Entitlement Flow of 1850 GL for the next water year unless there is substantial improvement in water availability by June 2016.

River Murray water access entitlement holders are likely to receive less than their full allocations from the commencement of the 2016-17 water year due to continuing dry conditions across the Murray-Darling Basin and forecasts of low storage volumes.

The recent El Niño weather event resulted in hot and dry conditions across much of Australia and while the event has peaked, it is uncertain if there will be significant rainfall or inflows in the Basin by the start of the 2016-17 water year.

River Murray system inflows over the past six months have declined and storage volumes are well below average, reducing water resources availability across the Basin and the likely volume of water available to South Australia.

On 1 March 2016, South Australia had 152 GL of deferred water in storage – 92.1 GL for critical human water needs and 59.9 GL for private carryover use in future years. DEWNR will continue to look for opportunities to defer additional Entitlement Flow in 2015-16.

Information on the water availability outlook will continue to be provided in this monthly River Murray Flow Report and Water Resources Update.

The South Australian Government intends to provide potential opening allocations by the end of April.

The announcement on actual River Murray water allocations for 2016-17 will be made on 1 July 2016.

## WATER QUALITY – Algal Blooms

The New South Wales Government (through Sunraysia Regional Algal Coordinating Committee) has issued a red alert warning for toxic blue-green algae in the Darling River at Menindee and Weir 32 where the water is unsuitable for recreation, stock and domestic use.

The New South Wales Government (through the Murray Regional Algal Coordinating Committee) has expanded the red alert warning for toxic blue-green algae to include the entire Edward and Wakool River systems. The alert is now in place for the River Murray from, and including, Hume Dam to Barham, as well as the Edward and Wakool River systems. In these areas the water is unsuitable for recreation, stock and domestic, irrigation and potable use.

The New South Wales Government (through the Murrumbidgee Regional Algal Coordinating Committee) has issued a red alert warning for toxic blue-green algae in the Murrumbidgee at Carrathool and Hay. In these areas the water is unsuitable for recreation, stock and domestic, irrigation and potable use.

Although these toxic blue-green algal blooms pose no immediate threat to South Australia at this stage, the Murray-Darling Basin Authority and the relevant South Australian Government agencies are regularly monitoring the situation.

It is not uncommon to experience algal blooms at this time of the year.

# River Murray Flow Report and Water Resources Update

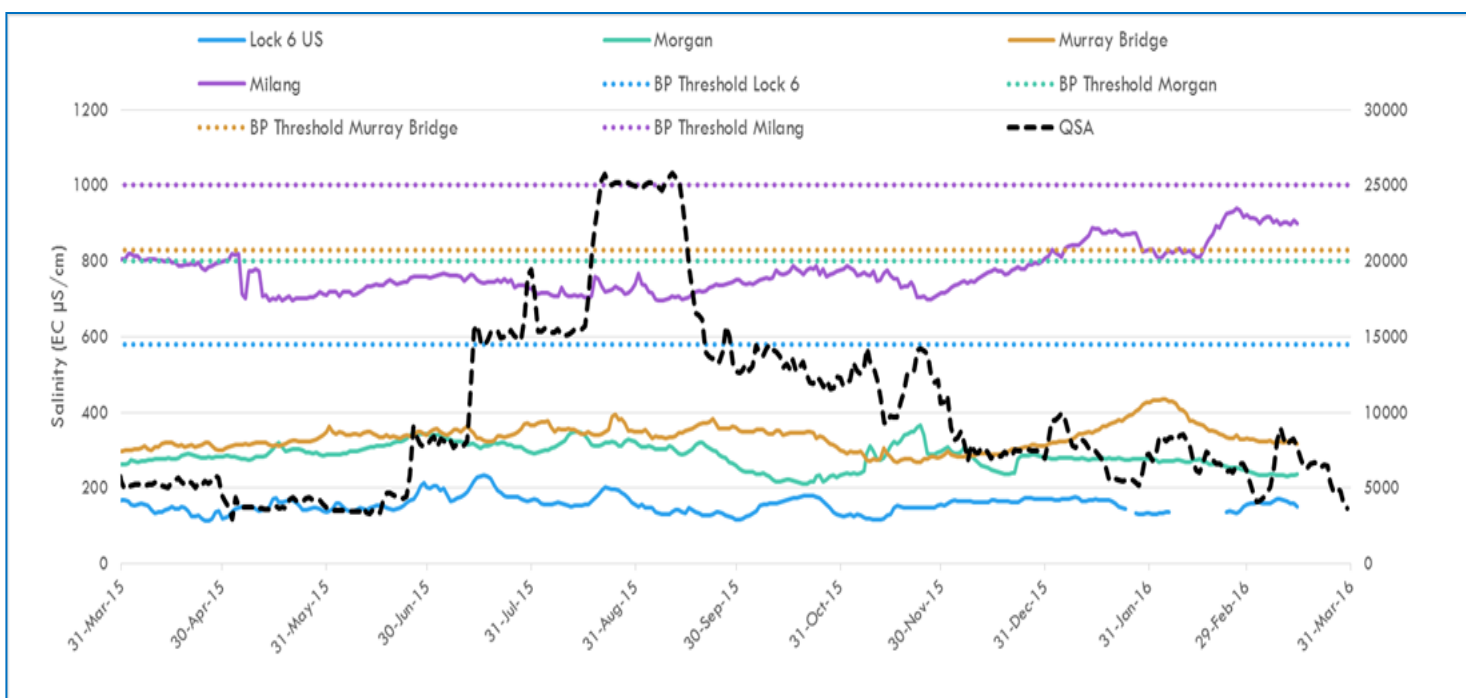
## WATER QUALITY - Salinity

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 March 2015 to March 2016. The dashed-lines identify the Basin Plan (BP) thresholds for the corresponding colour coded location. It confirms that salinity has not exceeded the threshold at any of these four locations during this period.

### SA River Murray Daily Average Salinity



Note: Estimates have been used for missing Milang salinity readings from 10-17 March and 3-8 May 2015. Missing Lock 6 salinity readings from 8-23 February 2016 is due to a faulty EC sensor.

## FLOW OUTLOOK

The flow at the South Australian border is approximately 6.5 GL/day and will increase to around 7.5 GL/day during the coming week. It comprises the normal March Entitlement Flow of 6 GL/day less deferred Entitlement Flow plus environmental water.

The flow over Lock 1 is approximately 4.5 GL/day and will remain around this rate during the coming week, depending on weather conditions and extractions.

It is important to note that flow forecasts in this advice are based on the information available at the time of preparation. They may change as new gauging information becomes available, or due to rainfall events or changed operations upstream. Flow forecasts are dependent on predictions made by the Bureau of Meteorology, Murray-Darling Basin Authority and water management agencies in upstream jurisdictions. The forecasts will be revised as new information becomes available.

## ENVIRONMENTAL WATER

During March 2016, the Commonwealth Environmental Water Holder (CEWH) 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.

The total volume of environmental water expected to be delivered in March is up to 59 GL. By the end of March the total volume of environmental water delivered to South Australia in 2015-16 should be approximately 864 GL, which includes 135 GL of environmental water provided as part of South Australia's Entitlement Flow.

DEWNR is currently negotiating for additional environmental water to be delivered during the remainder of 2015-16.

## MANAGEMENT OF SOUTH AUSTRALIA'S DEFERRED WATER

The Murray-Darling Basin Authority confirmed that, on 1 March 2016, South Australia had 152 GL of deferred water in storage. Of this total, 92.1 GL is stored for critical human water needs and 59.9 GL for private carryover use in future dry years. Volumes stored are adjusted for net evaporation losses until delivered to South Australia.

DEWNR will continue to pursue opportunities to defer additional Entitlement Flow during 2015-16. Opportunities to defer and store water are considered on the basis of how Entitlement Flow is managed, plus operational flow objectives for water quality and weather conditions.

## 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.

Dredges are operating in the Tauwitche and Goolwa Channels. At 13 March 2016, approximately 1 126 000 cubic metres of sand had been removed. Routine monitoring confirms an improvement in the condition of both channels as a result of dredging.

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:

[http://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 and flyers distributed advising of Exclusion Zones.

Any boats navigating through the Murray Mouth area should proceed with caution due to sandbars being present at shallow depth. Boats equipped with 'echo sounders' are strongly encouraged to regularly check depths and avoid travelling at low tide.

## BARRAGE OPERATIONS AND WATER LEVELS IN THE LOWER LAKES

The water level in Lake Alexandrina is approximately 0.58 m AHD and in Lake Albert is approximately 0.54 m AHD. The difference in water levels is due to wind effects. During the week ending 15 March 2016, total barrage releases were approximately 16.5 GL. Barrage releases at Tauwitche are providing freshwater flow to the Coorong to improve salinity levels. All fishways are operational to provide a critical connection for fish passage between Lake Alexandrina and the Coorong.

SA Water will continue to operate the barrages to minimise any negative salinity impacts from reverse flow events.

## River Murray Flow Report and Water Resources Update

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

### **WEIR POOL OPERATIONS**

The Lock 1 weir pool remains approximately 0.1 m below the normal pool level of 3.2 m AHD to enable engineering investigations to be undertaken at the weir.

### **NAVIGATION ISSUES**

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 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 March 2016

Location	River km	Normal Pool Level	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	30.92	33.81	33.32	32.28
Lock 9 Kulnine	764.8	27.40	27.48	30.03	29.44	28.80
Lock 8 Wangumma	725.7	24.60	24.03	27.60	27.19	26.79
Lock 7 Rufus River	696.6	22.10	21.89	25.70	25.24	24.92
Lock 6 Murtho	619.8	19.25	19.25	21.03	20.50	20.11
Renmark	567.4	-	-	18.54	18.04	17.38
Lock 5	562.4	16.30	16.31	18.07	17.50	17.05
Lyrup	537.8	-	13.23	16.85	16.26	15.68
Berri	525.9	-	13.21	15.81	15.74	15.16
Lock 4	516.2	13.20	13.21	15.65	15.08	14.75
Loxton	489.9	-	10.03	15.05	14.12	13.42
Cobdogla	446.9	-	9.83	13.44	12.38	11.52
Lock 3	431.4	9.80	9.81	13.16	12.02	10.93
Overland Corner	425.9	-	6.23	12.73	11.58	10.27
Waikerie	383.6	-	6.25	11.26	10.24	9.06
Lock 2	362.1	6.10	6.13	10.28	9.30	8.25
Cadell	332.6	-	3.22	9.17	8.08	6.82
Morgan	321.7	-	3.19	8.85	7.65	6.20
Lock 1 Blanchetown	274.2	3.20	3.13	6.81	5.38	4.42
Swan Reach	245.0	0.75	0.59	6.06	4.51	3.09
Mannum PS	149.8	0.75	0.60	3.15	1.90	1.46
Murray Bridge	115.3	0.75	0.54	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:

<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:

<https://www.waterconnect.sa.gov.au/Systems/RTWD/Pages/Default.aspx>

<http://www.sawater.com.au/SAWater/Environment/WaterProofingAdelaide/TheRiverMurray/RMOU/Dailyflow.htm>

<http://livedata.mdba.gov.au/>

The Department of Environment, Water and Natural Resources has published a series of inundation maps for the River Murray. They are available at:

<https://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:

[http://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: <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:

<http://www.mdba.gov.au/managing-water/environmental-water/delivering-environmental-water/living-murray-program>

Department of Environment, Water and Natural Resources

<http://www.environment.sa.gov.au/Home>

Information provided by the Department of Transport, Energy 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)

ID	RM-Flow-Report-20160318
Classification	Public I2 A2
Issued	18 March 2016
Authority	DEWNR
Master Document Location	Q:\OMP\RM REM\02 RM Ops\04 Communications\Flow Advices\2015-16
Managed and Maintained by	River Murray Operations
Author	River Murray Operations
Reviewer	Director River Murray Operations, Strategy and Advice

