

# RIVER MURRAY FLOW REPORT and WATER RESOURCES UPDATE

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Report #35/2016

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This supersedes the previous flow report issued by the Department of Environment, Water and Natural Resources (DEWNR) on 9 September 2016. The next flow report will be provided on Friday 23 September 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) will be 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. They will receive a letter and updated water account with their carryover volume endorsed. It is expected that this advice will be received in October 2016.

## MANAGEMENT OF SOUTH AUSTRALIA'S DEFERRED WATER

The Murray-Darling Basin Authority confirmed that on 1 September 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 August 2016, the total River Murray System inflow was approximately 1 960 GL, which is above the August long-term average of 1 590 GL. Inflow to Menindee Lakes (from the Darling System) during August 2016 was approximately 80 GL, which is about half the August long-term average of 180 GL.

The flow to South Australia during August 2016 was approximately 854 GL, which is around the August long-term average of approximately 860 GL. The flow comprised:

- approximately 124 GL of Entitlement Flow;
- approximately 4.1 GL of environmental water from the Commonwealth Environmental Water Holder (CEWH), The Living Murray (TLM) and other sources;
- approximately 716.1 GL of unregulated flow; and
- approximately 9.8 GL of spilt SA Storage Right from Hume Reservoir.



## STORAGE VOLUMES

Murray-Darling Basin storage volumes at 14 September 2016 and 14 September 2015

Storage	Full Supply Volume (GL)	14-09-2016 (GL)	14-09-2015 (GL)	Long-term average (end of September)
Dartmouth	3 856	2 367 (61%)	2 598 (67%)	
Hume	3 003	2 911 (97%)	1 518 (51%)	
Lake Victoria	677	564 (83%)	565 (83%)	
Menindee Lakes	*1 731	267 (15%)	103 (6%)	
<b>TOTAL</b>	<b>9 267</b>	<b>6 109 (66%)</b>	<b>4 784 (52%)</b>	<b>7 458 (80%)</b>

\*Menindee Lakes can be surcharged to 2 015 GL

## MENINDEE LAKES

The Murray-Darling Basin Authority is entitled to direct releases from the Menindee Lakes to supplement water availability in the River Murray until the stored volume in Menindee Lakes decreases to 480 GL. When the volume held in Menindee Lakes decreases to 480 GL, the Murray-Darling Basin Authority is not entitled to direct releases to supplement the River Murray until the volume in storage exceeds 640 GL.

On 18 February 2014, the volume in the Menindee Lakes dropped to below 480 GL and has not increased to above 640 GL.

## RAINFALL AND TEMPERATURE OUTLOOK

The latest Bureau of Meteorology weather outlook for September to November 2016 indicates average rainfall is likely across the Murray-Darling Basin with temperatures above average. The outlook is influenced by a negative Indian Ocean Dipole (IOD) and a La Niña watch remains in place.

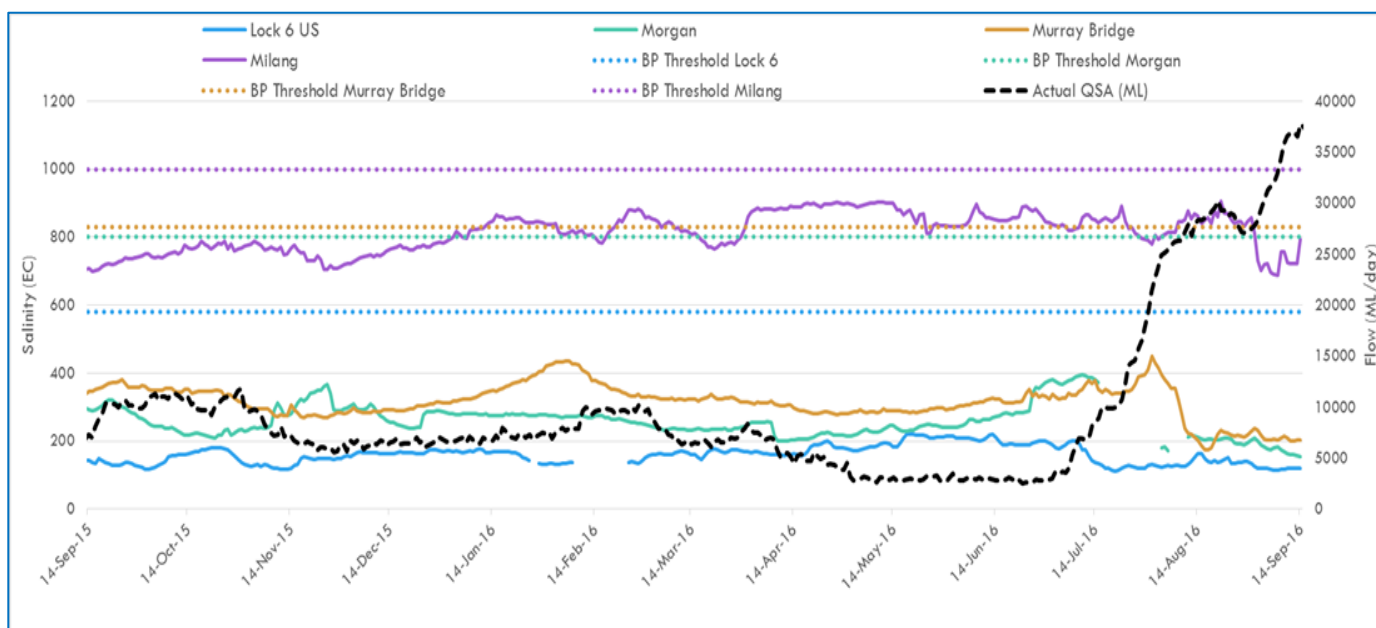
## WATER QUALITY - Salinity

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 September 2015 to September 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 is due to a faulty EC sensor.  
The missing Morgan salinity readings from 16-11 August 2016 is due to a faulty EC sensor

### FLOW OUTLOOK

The flow at the South Australian border is approximately 37 GL/day and will increase to around 40 GL/day during the coming week. It comprises the normal September Entitlement Flow of 4.5 GL/day plus environmental water and unregulated flow.

The flow over Lock 1 is approximately 35 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. The forecasts will be revised as new information becomes available.

### ENVIRONMENTAL WATER

During September 2016, the Commonwealth Environmental Water Holder and the Murray-Darling Basin Authority's *The Living Murray* are expected to provide up to 12 GL of 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. Dredges are operating in the Tauwitchere and Goolwa Channels. At 11 September 2016, approximately 1 594 800 cubic metres of sand had been removed. The dredging operations combined with recent substantial barrage releases have improved conditions at the Murray Mouth.

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Mariners are advised that due to recent high rainfall in the local area, adverse weather conditions and unregulated flows, barrage releases will be undertaken at every opportunity when conditions allow, to decrease the water level in the Lower Lakes.

Mariners should be aware that barrage releases are likely to be varied ie 0 GL/day to approximately 50 GL/day and could cause a hazard for boating in the Coorong and the Murray Mouth. Mariners are advised that there are 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 [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 advising of Exclusion Zones.

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

The water level in Lake Alexandrina and Lake Albert is approximately 0.91 m AHD. The high water level is a result of poor weather conditions limiting times that the barrages can be opened and local high rainfall. Barrage operations will be actively managed, when conditions allow, to decrease the water level in the Lower Lakes.

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 Goolwa, Tauwitchere, Ewe Island and Mundoo barrages. The primary aims of the releases are to lower water levels and reduce salinity levels in the Lower Lakes, and to scour sand from the Murray Mouth. All fishways are operational to provide fish passage between Lake Alexandrina and the Coorong.

During the week ending 13 September 2016, total barrage releases were approximately 168 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 Commonwealth Environmental Water Office.

### **WEIR POOL OPERATIONS**

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

On 15 August 2016, the Lock 2 and Lock 5 weir pools commenced being raised above their normal operating range as defined in the table below.

<b>Weir</b>	<b>Normal Pool Level (NPL) m AHD</b>	<b>Normal Operating Range m AHD</b>
Lock 6 - Murtho	19.25	19.17 - 19.50
Lock 5 - Renmark	16.30	16.22 - 16.43
Lock 2 – Waikerie	6.10	6.02 - 6.40

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The Lock 2 weir pool is being raised by up to 0.75 m above NPL and the Lock 5 weir pool by 0.45 m above NPL, from August to October. This will raise Lock 2 to 6.85 m AHD. Lock 5 has reached its target level of 16.75 m AHD. The weir pool raisings are using unregulated flow and Commonwealth environmental water.

Weir pool manipulations aim to reinstate some of the natural variability of water levels in the River Murray system, which has been lost due to river regulation. The manipulations will assist to improve lateral connectivity, health, resilience and biodiversity of the river channel, floodplain and wetlands. It is intended that weir pool manipulations will become a routine part of river operations.

### **CHOWILLA WATERING**

Operations to further test the Chowilla Regulator and ancillary structures are proceeding as planned. The operations are anticipated to continue until December 2016, provided flow conditions remain favourable. Testing involves progressively placing stop logs between the concrete piers at the Chowilla Regulator to raise the water level behind the structure. The initial target water level at the Chowilla Regulator of 19.4 m AHD (3.1 m above NPL) has been achieved with resulting inundation of approximately 4000 hectares of floodplain. If the River Murray flow conditions remain favourable then the target water level may be increased up to 19.75 m AHD.

As water levels are being raised behind the Chowilla Regulator, the Lock 6 water level has also been progressively raised, at a rate of approximately by 0.05 m/day, and is currently at 19.75 m AHD (0.5 m above NPL). Lock 6 may be raised up to its maximum level of 19.87 m AHD (0.62 m above NPL) as further testing progresses. Raising the Lock 6 water level is important for managing water quality and protecting important habitat for native fish. This event will enable further testing of the environmental watering structures and create inundation across the floodplain, which will improve the condition of floodplain vegetation and provide habitat for wildlife.

### **MODERNISATION OF WAIKERIE RIVER VESSEL WASTE DISPOSAL STATION**

Modernisation of the Waikerie River Vessel Waste Disposal Station commenced on 25 July 2016 and is progressing well. The facility will be closed until 31 October 2016. Alternative temporary arrangements for pumping waste from vessels have been established. The temporary pump-out service is available 1 kilometre downstream of the Waikerie River Vessel Waste Disposal Station. Users will need to call Mr Mick Kemp on 0428 861 777 to arrange a suitable time between 8 am and 4 pm. Please note that at least 3 hours notice will be essential.

### **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.

Mariners should be aware that barrage releases are likely to be varied during the coming week ie 0 GL/day to approximately 50 GL/day and could cause a hazard for boating in the Coorong and the Murray Mouth.

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## 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 14 September 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	30.50	33.81	33.32	32.28
Lock 9 Kulnine	764.8	27.40	27.44	30.03	29.44	28.80
Lock 8 Wangumma	725.7	24.60	25.07	27.60	27.19	26.79
Lock 7 Rufus River	696.6	22.10	23.40	25.70	25.24	24.92
Lock 6 Murtho	619.8	19.25	19.75	21.03	20.50	20.11
Renmark	567.4	-	-	18.54	18.04	17.38
Lock 5	562.4	16.30	16.77	18.07	17.50	17.05
Lyrup	537.8	-	13.78	16.85	16.26	15.68
Berri	525.9	-	13.54	15.81	15.74	15.16
Lock 4	516.2	13.20	13.35	15.65	15.08	14.75
Loxton	489.9	-	11.59	15.05	14.12	13.42
Cobdogla	446.9	-	10.11	13.44	12.38	11.52
Lock 3	431.4	9.80	9.87	13.16	12.02	10.93
Overland Corner	425.9	-	7.98	12.73	11.58	10.27
Waikerie	383.6	-	7.15	11.26	10.24	9.06
Lock 2	362.1	6.10	6.73	10.28	9.30	8.25
Cadell	332.6	-	4.36	9.17	8.08	6.82
Morgan	321.7	-	4.03	8.85	7.65	6.20
Lock 1 Blanchetown	274.2	3.20	3.12	6.81	5.38	4.42
Swan Reach	245.0	0.75	1.41	6.06	4.51	3.09
Mannum PS	149.8	0.75	1.00	3.15	1.90	1.46
Murray Bridge	115.3	0.75	1.10	2.06	1.26	1.21

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

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## 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 [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 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)

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