

# RIVER MURRAY FLOW REPORT and WATER RESOURCES UPDATE

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Report #17/2016

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**This supersedes the previous flow report issued by the Department of Environment, Water and Natural Resources (DEWNR) on 6 May 2016. The next flow report will be provided on Friday 20 May 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 RESOURCES UPDATE

During April 2016, the total River Murray System inflow was approximately 58 GL, which is about a quarter of the April long-term average of 258 GL. Inflow to Menindee Lakes (from the Darling System) during April 2016 was approximately 0 GL, which is well below the April long-term average of 226 GL.

The flow to South Australia during April 2016 was approximately 159 GL, which is below the April long-term average of approximately 306 GL. The flow comprised:

- approximately 122 GL of Entitlement Flow (135 GL of April Entitlement Flow less 13 GL of deferred Entitlement Flow);
- approximately 42 GL of environmental water from the Commonwealth Environmental Water Holder (CEWH), The Living Murray (TLM) and other sources; and
- less approximately 5 GL of trade into South Australia.

## STORAGE VOLUMES

Murray-Darling Basin storage volumes at 11 May 2016 and 11 May 2015

Storage	Full Supply Volume (GL)	11-05-2016 (GL)	11-05-2015 (GL)	Long-term average (end of May)
Dartmouth	3 856	1 680 (44%)	2 910 (75%)	
Hume	3 003	584 (19%)	600 (20%)	
Lake Victoria	677	229 (34%)	262 (39%)	
Menindee Lakes	1 731*	**49 (3%)	64 (4%)	
<b>TOTAL</b>	<b>9 267</b>	<b>2 542 (27%)</b>	<b>3 836 (41%)</b>	<b>5 728 (62%)</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.



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## RAINFALL AND TEMPERATURE OUTLOOK

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

The Bureau of Meteorology has released its ENSO Outlook, which indicates a La Niña watch for the upcoming season. A La Niña watch means there is approximately 50% chance of a La Niña event in 2016.

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

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

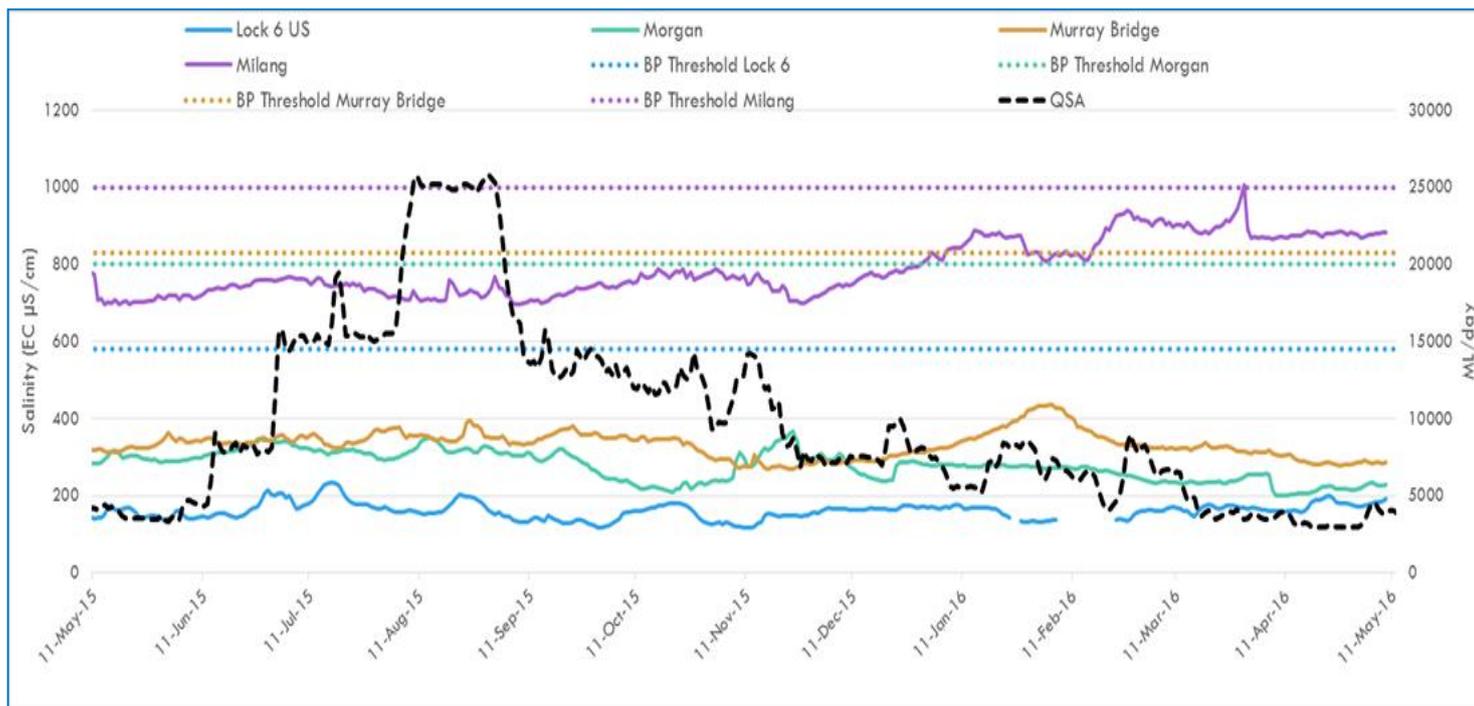
## WATER QUALITY - Salinity

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 May 2015 to May 2016. The dashed-lines identify the Basin Plan (BP) thresholds for the corresponding colour coded location.

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.

The peak salinity at Milang in March 2016 was due to an accumulation of algae and silt that built up on the sensor, the drop in levels indicates when the sensor was cleaned.

## FLOW OUTLOOK

The flow at the South Australian border is approximately 2.9 GL/day and will remain around this rate during the coming week. It comprises the normal May Entitlement Flow of 3 GL/day less deferred Entitlement Flow plus environmental water.

The flow over Lock 1 is approximately 2.2 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 May 2016, the Commonwealth Environmental Water Holder (CEWH) and the Murray-Darling Basin Authority's *The Living Murray* are expected to provide up to 25 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 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 May 2016, South Australia had 174.3 GL of deferred water in storage. Of this total, 113.1 GL is stored for critical human water needs and 61.2 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.

## WATER ALLOCATIONS AND CARRYOVER

Water access entitlement holders will be provided with a minimum opening allocation of 36 per cent in 2016-17. Should the water resource availability improve from the current very dry conditions across the Murray-Darling Basin, then these improvements will be translated into improvements in water allocations.

Improvements to the opening water allocations will be announced through future River Murray Flow Reports, until 100 per cent water allocation is achieved.

The actual opening water allocation will be announced before 1 July 2016.

Carryover will be granted in 2016-17. Carryover can only be granted to eligible River Murray water access entitlement holders (up to a maximum of 20 per cent of entitlement volume). Eligibility criteria includes:

- underuse in 2015-16; and
- final meter readings submitted to DEWNR by 31 July 2016.

If you don't have a water meter you may still be eligible for carryover but you must contact DEWNR by 31 July 2016.

Unused water allocations traded into South Australia in 2015-16 will also be included in determining 2015-16 underuse and eligibility for carryover in 2016-17.

All environmental water that is part of South Australia's Entitlement Flow (including water owned by CEWH, Murray-Darling Basin Authority's *The Living Murray*, and the South Australian Government) will be delivered and used by the end of 2015-16. Therefore no environmental water will be carried over into 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 Tauwitche and Goolwa Channels. At 8 May 2016, approximately 1 245 500 cubic metres of sand had been removed. Routine monitoring confirms an improvement in the condition of both channels as a result of dredging, but dredging is expected to remain in place until substantial high flows return.

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.

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 0.54 m AHD and in Lake Albert is approximately 0.62 m AHD. The difference in water levels is due to wind effects.

During the week ending 10 May 2016, total barrage releases were approximately 5.5 GL. The barrages were closed for most of the week to minimise the risk of seawater entering Lake Alexandrina due to strong winds. For a short period on Sunday and Monday, an opportunity was taken to open up to 70 barrages to release environmental water into the Coorong. This operation, combined with the conditions (high tides and strong winds) pushed fresh water towards the Coorong Southern Lagoon. All barrages are now closed but will be re-opened again when conditions improve. Fishways are operational to provide a 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.

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



Wild weather conditions at Goolwa Barrage on Monday, 9 May 2016

### **WEIR POOL OPERATIONS** *(current)*

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.

### **WEIR POOL OPERATIONS** *(potential)*

DEWNR is currently considering raising Locks 2 and 5 weir pools, during spring (August to October), above their normal operating range. This is a planned event, where any operation or activity will depend on potential flow to South Australia, and for the availability of environmental water across the Murray-Darling Basin.

Weir pool manipulations aim to reinstate some of the natural variability of water levels in the River Murray system, which have 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. Weir pool manipulations are an increasingly common feature of routine river operations.

### **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.

### **WATER QUALITY – Algal Blooms**

On 9 May 2016, New South Wales lifted the red alert warning for blue-green algae in Hume Dam and downstream in the River Murray to, and including, Corowa. The red alert warning for blue-green algae remains in place downstream of Corowa to Lock 9 including Lake Mulwala, as well as the Edward and Wakool River system.

SA Water's monitoring results show that current levels of blue-green algae in South Australia do not represent a threat to use of River Murray water for irrigation. It is advisable to avoid contact with obviously green discoloured water or scum as it may cause skin irritations in some people. Samples collected in South Australia have been extensively tested for the presence of a range of known toxins and none were detected.

SA Water increases sampling whenever a water quality event is detected to allow for timely action. SA Water, SA Health and DEWNR have been monitoring the occurrence of blue-green algal blooms in Victoria, NSW and South Australia. SA Water uses the water quality data to continually adjust operations to minimise impacts to water treatment plants and other users located along the River Murray.

The Murray-Darling Basin Authority and the relevant South Australian Government agencies are regularly monitoring the situation. If the situation changes, advice will be provided to the community.

### **WATER TRADE CUT-OFF DATE**

The South Australian Government has announced the introduction of a cut-off date for water access entitlement holders to receive guaranteed processing and determining of River Murray allocation trade applications for the 2015-16 water year.

The cut-off date is the third Friday in June. This means for 2015-16, water allocation trade applications received by 17 June 2016 are guaranteed to be processed within the same water year.

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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 11 May 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	30.84	33.81	33.32	32.28
Lock 9 Kulnine	764.8	27.40	27.41	30.03	29.44	28.80
Lock 8 Wangumma	725.7	24.60	24.59	27.60	27.19	26.79
Lock 7 Rufus River	696.6	22.10	22.12	25.70	25.24	24.92
Lock 6 Murtho	619.8	19.25	19.19	21.03	20.50	20.11
Renmark	567.4	-	-	18.54	18.04	17.38
Lock 5	562.4	16.30	16.33	18.07	17.50	17.05
Lyrup	537.8	-	13.26	16.85	16.26	15.68
Berri	525.9	-	13.24	15.81	15.74	15.16
Lock 4	516.2	13.20	13.22	15.65	15.08	14.75
Loxton	489.9	-	9.96	15.05	14.12	13.42
Cobdogla	446.9	-	9.83	13.44	12.38	11.52
Lock 3	431.4	9.80	9.82	13.16	12.02	10.93
Overland Corner	425.9	-	6.32	12.73	11.58	10.27
Waikerie	383.6	-	6.24	11.26	10.24	9.06
Lock 2	362.1	6.10	6.12	10.28	9.30	8.25
Cadell	332.6	-	3.19	9.17	8.08	6.82
Morgan	321.7	-	3.16	8.85	7.65	6.20
Lock 1 Blanchetown	274.2	3.20	3.11	6.81	5.38	4.42
Swan Reach	245.0	0.75	0.57	6.06	4.51	3.09
Mannum PS	149.8	0.75	0.61	3.15	1.90	1.46
Murray Bridge	115.3	0.75	0.52	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:

<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)

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