# RIVER MURRAY FLOW REPORT and WATER RESOURCES UPDATE

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**Report #23/2016**
**Issued 10:00 am 24 June 2016**

**This supersedes the previous flow report issued by the Department of Environment, Water and Natural Resources (DEWNR) on 17 June 2016. The next flow report will be provided on Thursday, 30 June 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 May 2016, the total River Murray System inflow was approximately 325 GL, which is three quarters of the May long-term average of 443 GL. Inflow to Menindee Lakes (from the Darling System) during May 2016 was approximately 0 GL, which is well below the May long-term average of 201 GL.
The flow to South Australia during May 2016 was approximately 92 GL, which is about quarter of the May long-term average of approximately 351 GL. The flow comprised:

- approximately 70 GL of Entitlement Flow (90 GL of May Entitlement Flow less 20 GL of deferred Entitlement Flow); and
- approximately 22 GL of environmental water from the Commonwealth Environmental Water Holder (CEWH), The Living Murray (TLM) and other sources.

## STORAGE VOLUMES

Murray-Darling Basin storage volumes at 22 June 2016 and 22 June 2015

| Storage | Full Supply Volume (GL) | 22-06-2016 (GL) | 22-06-2015 (GL) | Long-term average (end of June) |
|---|---|---|---|---|
| Dartmouth | 3 856 | 1 765 (46%) | 2 833 (73%) | |
| Hume | 3 003 | 991 (33%) | 948 (32%) | |
| Lake Victoria | 677 | 400 (59%) | 432 (64%) | |
| Menindee Lakes | *1 731 | **48 (3%) | 78 (4%) | |
| TOTAL | 9 267 | 3 204 (35%) | 4 291 (46%) | 6 173 (67%) |

*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 June to August 2016 indicates above average rainfall is likely across the Murray-Darling Basin with temperatures below average. The outlook is influenced by a warm Indian Ocean, where a negative Indian Ocean Dipole (IOD) may be in the early stages of development. Negative IOD events typically bring higher than usual winter and spring rainfall to southern Australia. La Niña conditions are neutral in the Pacific Ocean. The Bureau of Meteorology refers to this situation as a La Niña watch. La Niña watch means there is approximately 50% chance of a La Niña event in 2016 La Niña conditions usually contribute towards above average rainfall across northern, central and eastern Australia.

For the latest La Niña advice please refer to the following website http://www.bom.gov.au/climate/enso/

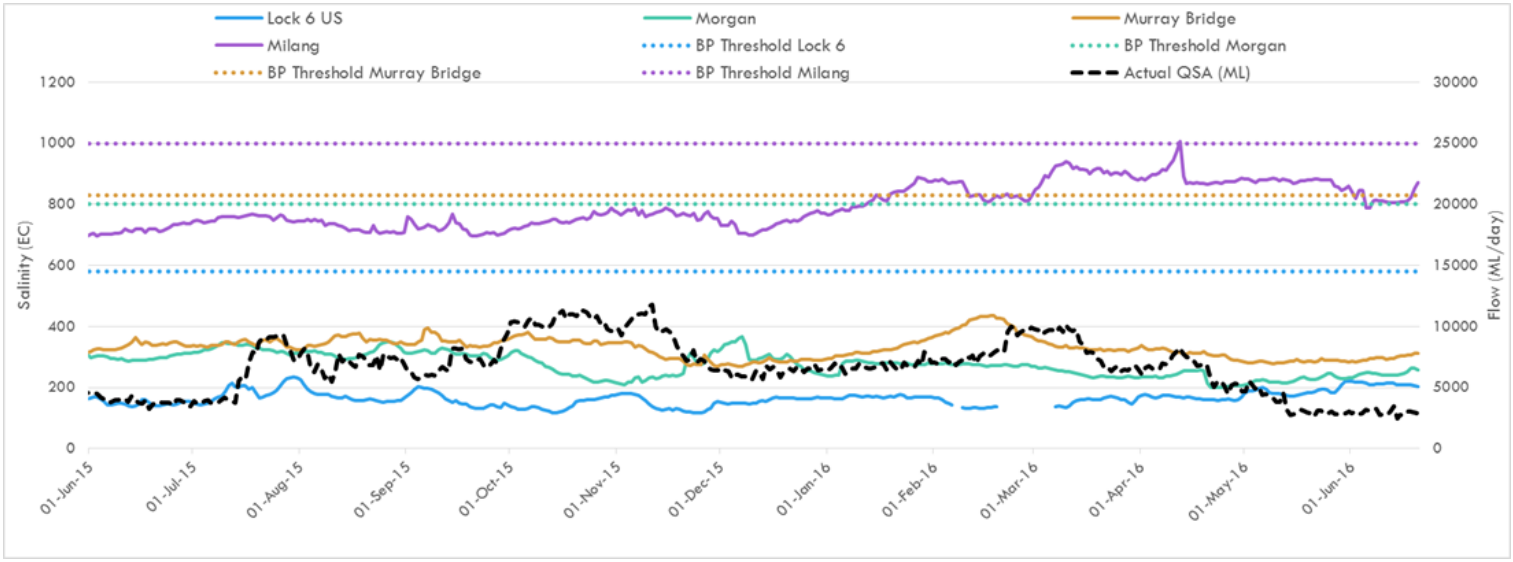
## WATER QUALITY - Salinity

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 June 2015 to June 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 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 2.7 GL/day and will increase to around 3.2 GL/day during the coming week. It comprises the normal June Entitlement Flow of 3 GL/day less deferred Entitlement Flow plus environmental water.

The flow over Lock 1 is approximately 2.4 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 June 2016, the Commonwealth Environmental Water Holder (CEWH) and the Murray-Darling Basin Authority's *The Living Murray* are expected to provide up to 16 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.

## MANAGEMENT OF SOUTH AUSTRALIA'S DEFERRED WATER

The Murray-Darling Basin Authority confirmed that, on 1 June 2016, South Australia had 194.2 GL of deferred water in storage. Of this total, 123 GL is stored for critical human water needs and 71.2 GL for private carryover use in future dry years. Volumes stored are adjusted for net evaporation losses until delivered to South Australia.

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. The actual opening water allocation will be announced by 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 Tauwitchere and Goolwa Channels. At 19 June 2016, approximately 1 355 900 cubic metres of sand had been removed. The dredges are currently working 24 hours a day, 7 days a week, to move the significant volume of sand that was transported into the Murray Mouth as a result of storm events in late-May.

Mariners are advised that there are a number of shallow zones in the Murray Mouth. Mariners should follow all directions in the area and reduce their speed. Boats equipped with echo sounders are strongly encouraged to 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

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 0.65 m AHD and in Lake Albert is approximately 0.74 m AHD. The difference in water levels is due to wind effects.

During the week ending 21 June 2016, total barrage releases were less than 1 GL. The barrages are closed to minimise the risk of seawater entering Lake Alexandrina due to adverse conditions but will be re-opened 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.

**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 the Lock 2 weir pool by up to 75 cm above normal pool level (NPL) and Lock 5 weir pool by up to 50 cm above NPL, during spring (August to October).. Raising of Lock 6 is also being considered in association with the potential operation of the Chowilla Regulator. While these events are being planned, any operation or activity will depend on the flow to South Australia and 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.

**CHOWILLA WATERING**

A range of environmental watering actions are being considered for the Chowilla Floodplain Icon site during 2016-17. These include potential further testing of the Chowilla Regulator to a higher level in conjunction with raising Lock 6. This will only occur if flow in the River Murray is in excess of 15 GL/day and environmental water is made available.

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

Modernisation of the Waikerie River Vessel Waste Disposal Station will commence on 25 July 2016. The facility will be closed until 31 October 2016. Alternative temporary arrangements for pumping waste from vessels have been arranged. The temporary pump out service will be available 1 Kilometre downstream of the Waikerie River Vessel Waste Disposal Station. Users will need to call Mr Mick Kemp on 0428 861 77 to arrange a suitable time between 8 am and 4 pm. Please note that 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.

**WATER QUALITY – Algal Blooms**

A red alert warning for blue-green algae is currently in place downstream of Lake Mulwala to Echuca and downstream of Merbein to Lock 9. The red alert warning for blue-green algae in the river Murray from Red Cliffs (in the Mildura Weir Pool) to Merbein has now been lifted.

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 introduced 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. This date has now passed (third Friday in June annually). Water allocation trade applications received by 17 June 2016 were guaranteed to be processed within 2015-16. Trade applications received after 17 June 2016 will be processed as soon as possible, but processing by 30 June 2016 cannot be guaranteed.

## 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 22 June 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 | 30.82 | 33.81 | 33.32 | 32.28 |
| Lock 9 Kulnine | 764.8 | 27.40 | 27.43 | 30.03 | 29.44 | 28.80 |
| Lock 8 Wangumma | 725.7 | 24.60 | 24.62 | 27.60 | 27.19 | 26.79 |
| Lock 7 Rufus River | 696.6 | 22.10 | 22.15 | 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 | 13.24 | 15.65 | 15.08 | 14.75 |
| Loxton | 489.9 | - | 10.00 | 15.05 | 14.12 | 13.42 |
| Cobdogla | 446.9 | - | 9.84 | 13.44 | 12.38 | 11.52 |
| Lock 3 | 431.4 | 9.80 | 9.82 | 13.16 | 12.02 | 10.93 |
| Overland Corner | 425.9 | - | 6.24 | 12.73 | 11.58 | 10.27 |
| Waikerie | 383.6 | - | 6.28 | 11.26 | 10.24 | 9.06 |
| Lock 2 | 362.1 | 6.10 | 6.16 | 10.28 | 9.30 | 8.25 |
| Cadell | 332.6 | - | 3.19 | 9.17 | 8.08 | 6.82 |
| Morgan | 321.7 | - | 3.19 | 8.85 | 7.65 | 6.20 |
| Lock 1 Blanchetown | 274.2 | 3.20 | 3.12 | 6.81 | 5.38 | 4.42 |
| Swan Reach | 245.0 | 0.75 | 0.71 | 6.06 | 4.51 | 3.09 |
| Mannum PS | 149.8 | 0.75 | 0.71 | 3.15 | 1.90 | 1.46 |
| Murray Bridge | 115.3 | 0.75 | 0.62 | 2.06 | 1.26 | 1.21 |

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

**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 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
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

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

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

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

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

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