

RIVER MURRAY FLOW REPORT and WATER RESOURCES UPDATE

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Report #26/2016

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This supersedes the previous flow report issued by the Department of Environment, Water and Natural Resources (DEWNR) on 8 July 2016. The next flow report will be provided on Friday, 22 July 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

Recent improvements to South Australia's share of the Murray-Darling Basin water resource have enabled water allocations to increase from 36 per cent to 52 per cent for South Australian River Murray water access entitlement holders (Class 3a, 3b, 4, 7 and 8). 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. Eligibility criteria include:

- 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.

As rainfall events occur and inflows to storages increase, water users will be advised of any improvements to their water allocations via this *River Murray Flow Report*.

MANAGEMENT OF SOUTH AUSTRALIA'S DEFERRED WATER

The Murray-Darling Basin Authority confirmed that on 1 July 2016, South Australia had 209.2 GL of deferred water held in storage. The table below identifies the storage in which it is held and the purpose.

At 1 July 2016				
Purpose	Lake Victoria (GL)	Hume (GL)	Dartmouth (GL)	Total (GL)
*CHWN	38.7	9.8	82.0	130.5
Private Carryover	19.0	0.0	59.7	78.7
Total	57.7	9.8	141.7	209.2

*Critical Human Water Needs (CHWN)

Volumes stored are adjusted for net evaporation losses and spills until delivered to South Australia. There has been no opportunity to move water held in Lake Victoria to a more secure upstream storage since March 2016.

As a result of an unregulated flow event occurring in July and early August 2016 (see *Flow Outlook* section), Lake Victoria is likely to fill and physically spill in August. South Australia's deferred water will be the first to spill because the rules under the Murray-Darling Basin Agreement require that water held by South Australia in the Storage Right must not affect water availability to New South Wales and Victoria. This unregulated flow event is likely to cause a spill of up to 57.7 GL (38.7 GL of water held for critical human water needs and 19 GL held for private carryover). All other private carryover water (59.7 GL) is currently held in Dartmouth Reservoir, where the risk of spill is much lower.

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 RESOURCES UPDATE

During June 2016, the total River Murray System inflow was approximately 762 GL, which is above the June long-term average of 739 GL. Inflow to Menindee Lakes (from the Darling System) during June 2016 was approximately 0 GL, which is well below the June long-term average of 135 GL. However, there is water in transit to Menindee Lakes, which may result in around 100 GL of inflow.

The flow to South Australia during June 2016 was approximately 85 GL, which is about a quarter of the June long-term average of approximately 389 GL. The flow comprised:

- approximately 75 GL of Entitlement Flow (90 GL of June Entitlement Flow less 15 GL of deferred Entitlement Flow); and
- approximately 10 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 13 June 2016 and 13 June 2015

Storage	Full Supply Volume (GL)	13-06-2016 (GL)	13-06-2015 (GL)	Long-term average (end of July)
Dartmouth	3 856	1 845 (48%)	2 840 (74%)	
Hume	3 003	1 335 (44%)	876 (29%)	
Lake Victoria	677	511 (75%)	395 (58%)	
Menindee Lakes	*1 731	**57 (3%)	76 (4%)	
TOTAL	9 267	3 748 (40%)	4 187 (45%)	6 659 (72%)

*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 July to September 2016 indicates above average rainfall is likely across the Murray-Darling Basin with temperatures below average. The outlook is influenced by a negative Indian Ocean Dipole (IOD), which typically brings 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.

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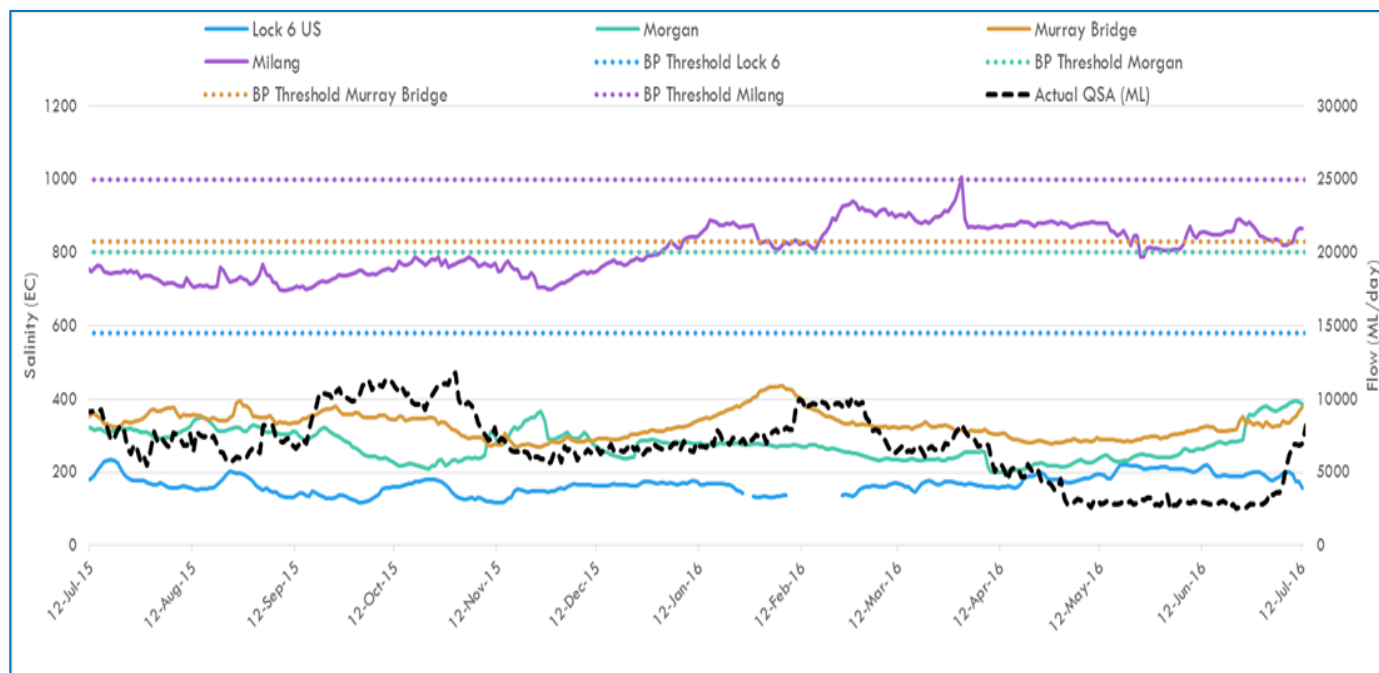
WATER QUALITY - Salinity

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 July 2015 to July 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 returned to normal function.

FLOW OUTLOOK

Recent rainfall across north eastern Victoria and the upper River Murray has resulted in inflow to the Murray-Darling Basin storages. In addition to this inflow, the Snowy Hydro Scheme has released water, which has increased the volume in storage.

South Australia is experiencing a unique situation where it is currently expecting to receive less than its Entitlement Flow for the 2016-17 water year, but receiving an unregulated flow event. The unregulated flow event is a result of rainfall and inflows to the River Murray System below Hume and Dartmouth Reservoirs (from sources such as the Murrumbidgee and Ovens Rivers), therefore the only opportunity to capture and store (regulate) this water is in Lake Victoria. The additional volume of water in the river is greater than the Lake Victoria inlet capacity so the additional water will flow into South Australia as an unregulated flow (meaning it cannot be captured and allocated for use at a later time). It is also likely that Lake Victoria will physically spill in August as a result of the unregulated flow.

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The flow at the South Australian border is approximately 10 GL/day and will increase to around 14.5 GL/day during the coming week. It comprises the normal July Entitlement Flow of 3.5 GL/day plus environmental water and unregulated flow.

The flow over Lock 1 is approximately 8.5 GL/day and will increase to around 11 GL/day 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 July 2016 the Commonwealth Environmental Water Holder (CEWH) and the Murray-Darling Basin Authority's *The Living Murray* are expected to provide up to 9 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 10 July 2016, approximately 1 426 800 cubic metres of sand had been removed.

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. 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 0.71 m AHD and in Lake Albert approximately 0.98 m AHD. The difference in water levels is due to wind effects.

During the week ending 12 July 2016, total barrage releases were less than 1 GL. The barrages have been closed to minimise the risk of seawater entering Lake Alexandrina during adverse conditions. Fishways are operational to provide 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

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.

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Using the current unregulated flow event, the Lock 2 and Lock 5 weir pools have been raised to the top of their normal operating range as defined in the table below.

Weir	Normal Pool Level (NPL) m AHD	Normal Operating Range m AHD
Lock 5 - Renmark	16.30	16.22 - 16.43
Lock 2 – Waikerie	6.10	6.02 - 6.40

Raising the water level to the top of the normal operating range is being treated as the first stage of a more substantial weir pool raising event that DEWNR is considering. The next stage would be to raise the Lock 2 weir pool by up to 0.75 m above normal pool level (NPL) and Lock 5 weir pool by up to 0.5 m above NPL, during spring (August to October). This would raise Lock 2 to 6.85 m AHD and Lock 5 to 16.80 m AHD. While these events are being planned, any further operation or activity will depend on the flow to South Australia (including unregulated flow) and availability of environmental water across the River Murray System.

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. It is intended that weir pool manipulations will become a routine part of river operations.

CHOWILLA WATERING

A range of environmental watering actions are being considered for the Chowilla Floodplain Icon site during 2016-17. Based on the improving water resource outlook, planning is in progress to commence the further testing of the Chowilla Regulator operation from mid-August. Operation is anticipated to commence once it is clear that flows at the South Australian border will exceed 15 GL/day, and environmental water will be made available. The further testing of the Chowilla Regulator would also be undertaken in conjunction with raising Lock 6.

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 861 777 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.

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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 13 July 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	30.80	33.81	33.32	32.28
Lock 9 Kulnine	764.8	27.40	27.60	30.03	29.44	28.80
Lock 8 Wangumma	725.7	24.60	24.63	27.60	27.19	26.79
Lock 7 Rufus River	696.6	22.10	22.08	25.70	25.24	24.92
Lock 6 Murtho	619.8	19.25	19.28	21.03	20.50	20.11
Renmark	567.4	-	-	18.54	18.04	17.38
Lock 5	562.4	16.30	16.42	18.07	17.50	17.05
Lyrup	537.8	-	13.24	16.85	16.26	15.68
Berri	525.9	-	13.21	15.81	15.74	15.16
Lock 4	516.2	13.20	13.18	15.65	15.08	14.75
Loxton	489.9	-	10.24	15.05	14.12	13.42
Cobdogla	446.9	-	9.91	13.44	12.38	11.52
Lock 3	431.4	9.80	9.86	13.16	12.02	10.93
Overland Corner	425.9	-	6.59	12.73	11.58	10.27
Waikerie	383.6	-	6.33	11.26	10.24	9.06
Lock 2	362.1	6.10	6.41	10.28	9.30	8.25
Cadell	332.6	-	3.21	9.17	8.08	6.82
Morgan	321.7	-	3.20	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	0.99	6.06	4.51	3.09
Mannum PS	149.8	0.75	0.93	3.15	1.90	1.46
Murray Bridge	115.3	0.75	0.82	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.waterconnect.sa.gov.au/Systems/RTWD/Pages/Default.aspx
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

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_reclaiming_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

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 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

Department of Environment, Water and Natural Resources 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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