

River Murray Weir Pool Manipulation

Frequently Asked Questions

Lowering and Raising Events at Locks 2, 5 and 6

During the winter and spring of 2017 weir pool manipulations will be conducted at Lock 2 (Waikerie), 5 (Renmark) and 6 (Murtho) on the River Murray. The following answers some of the most frequently asked questions in relation to weir pool manipulations.

What is happening and when

Starting 14 July 2017, the following weir pools in the River Murray system will be gradually *lowered* by 0.08 metres (8 cm) (within their normal operating ranges). Australian Height Data (AHD) is the measurement that sets mean sea level at zero elevation. The below operating ranges are above mean sea level.

- Lock 2 to 6.02 metres AHD
- Lock 5 to 16.22 metres AHD
- Lock 6 to 19.17 metres AHD.

Lowering these weir pools will be followed by weir pool *raisings* in late winter to spring, which could raise:

- Lock 2 by up to 0.5 m above the normal pool level to 6.60 m AHD (last year raised to 6.85 m AHD)
 - Lock 5 by up to 0.45 m above the normal pool level to 16.75 m AHD (last year raised to 16.80 m AHD)
 - Lock 6 by up to 0.62 m above the normal pool level to 19.87 m AHD (last year raised to 19.84 m AHD).
- Raising Lock 6 will only be undertaken if the potential operation of the Chowilla Regulator is undertaken.

What is the normal operating range for weir pools?

The normal operating range is defined as the expected water level variations under routine River Murray operations above or below normal pool level.

- Lock 2 - normal pool level is 6.1 metres AHD and the normal operating range is 6.02 to 6.4 metres AHD
- Lock 5 - normal pool level is 16.3 metres AHD and the normal operating range is 16.22 to 16.43 metres AHD
- Lock 6 - normal pool level at Lock 6 is 19.25 metres AHD and the normal operating range is 19.17 to 19.50 metres AHD.

Water levels within these weir pools are routinely monitored by the Department of Environment, Water and Natural Resources (DEWNR), and SA Water. The operating range may increase over time as a result of undertaking water level manipulation trials.

What are weirs, and how are they operated?

Weirs are water level regulating structures built in the 1920s and 1930s across the river to control and maintain constant water levels, mainly for watercraft navigation, irrigation development and supply of water to towns and farms. Weirs are often accompanied by locks which allow river vessels to travel through a weir. There are six weirs and locks on the main channel of the River Murray in South Australia.

Why do we need weir pool manipulation?

Prior to river regulation, water levels in the River Murray varied greatly in response to changes in seasonal conditions and water inflow. Weirs and locks have significantly influenced the river's water levels and have been operated to maintain a series of relatively stable pools. This highly modified environment has dramatically reduced the natural variability in water levels, resulting in reduced connectivity of the main channel to floodplains and wetlands. Some floodplains and wetlands have also been permanently connected to the main channel and therefore do not get the chance to partially or completely dry out. Weir pool water level manipulation involves use of the weirs to raise and lower water levels in a weir pool to re-connect these floodplains and wetlands and mimic some of the natural variation in water levels in order to improve the health of the river and ecosystems.

For further information you can watch a weir pool manipulation animation here <https://youtu.be/PKcZ2SjepM>



Why are we undertaking weir pool manipulation at Locks 2, 5 and 6?

After years of drought, River Murray flows were restored with the long awaited high flows during late 2010 and early 2011, providing significant benefits to the environment and communities. Recovery of the system began with these high flows and it is important we make the most of every opportunity to manipulate water levels to assist in ongoing recovery. Weir pool manipulation aims to improve the health of wetlands, floodplains and backwaters along the River Murray in South Australia. Building on the 2014, 2015 and 2016 weir pool raising experience in the Locks 1, 2, 5 and 6 weir pools, the 2017 event intends to lower the weir pool water level and then raise it again to restore a process of wetting and drying and sustain ecological responses in the Lock 2, 5 and 6 weir pools.

What benefits are expected from weir pool lowering?

Lowering the weir pool level for a period of time in the River Murray will improve in-channel water-level variability leading to the creation of wetting and drying in low-lying wetlands. Water fluctuations in low-lying floodplain habitats enable feeding, breeding and recruitment opportunities for flood-dependent organisms, and promote cycling of carbon and nutrients within the river, anabranches, floodplain and wetlands. Weir pool lowering may also result in:

- increase in distribution of water plants
- improved biofilm community diversity (more types of algae), thereby increasing their value as a food source for small critters (macro invertebrate) and fish
- drying and compacting of wetland sediments to reduce turbidity
- drying of soil bacteria to allow soil breakdown processes and nutrient release to occur. This will help feed water plants
- positive impacts for flowing water environments because of increased flow velocity, turbulence and salt mobilisation from wetlands and floodplains.

What benefits are expected from weir pool raising?

Weir pool raising increases water levels upstream of the weir and provides localised inundation to surrounding low-level wetland and floodplain areas. Ecological and environmental benefits from weir pool raising may include:

- improved vegetation and macro invertebrate communities by improving seed bank viability
- reduced water stress, and improved condition in floodplain vegetation (including red gum and black box)
- improved biofilm community diversity (more types of algae), thereby increasing their value as a food source for fish
- improved vegetation coverage and recruitment.

Does this event use water? Where does it come from?

Raising the weir pool beyond normal pool level will require additional water to increase the water level, and allow for evaporation and seepage. Lowering the weir pool requires an amount of water to refill the weir pools after they have been lowered, enabling them to return to normal pool level. Estimates of water use over a range of scenarios have been considered during the planning of weir pool manipulation events and modelling has been used to calculate the additional evaporation and soil infiltration use that may occur during weir pool raising due to the additional surface area and extent of floodplain inundation.

- The 2017 weir pool raisings at weirs 2 and 5 are predicted to use approximately 21 gigalitres (GL) to raise the weir pools, 18.5 GL of which will be returned to the river on drawdown of the weir pools. Therefore the net environmental use for the 2017 raising events will be approximately 2.5 GL.
- The amount of water required to refill weir pools 2, 5 and 6 back from the lowered state to normal pool level is 5.9 GL (this is the amount of water stored in the weir pool that will be released downstream when the weir pools are drawdown).
- Therefore the total combined net use for both raising and lowering for the 2017 weir pool manipulations will be approximately 8.4 GL.

The source of water for the planned 2017 event is from the Commonwealth Environmental Water component of South Australia's Entitlement Flow. Any operation or activity will depend on the flow to South Australia and the availability of environmental water across the Murray-Darling Basin.

Will the change in weir pool levels affect my road access?

Modelling and mapping indicates that there will be minimal impact to infrastructure. DEWNR would like to receive any information from you on any roads you think might be impacted or are being impacted, please refer to the contact details at the end of the document.



Will I have access to water for irrigation?

The 2017 planned weir pool water levels (raising and lowering) are not likely to affect irrigation practices. Weir pool raising operations are planned within limits already tested in 2015 and 2016. You may, however, need to raise your pump and other infrastructure when the weir pool water levels are raised above the normal operating range.

DEWNR recommends people adapt their pumping infrastructure and practices to withstand ongoing variable water levels, with the view that greater water level fluctuations (both raising and lowering) will become a part of routine operations in the future.

Will the change in pool levels affect boat access?

The 2017 planned weir pool lowering and raising is unlikely to lead to any major navigational problems. Boat operators should always use caution when navigating near the river banks as elevated water levels may increase the width of shallows near the banks in some places. Water levels will also be varied at some boat ramps and jetties and boat users should always use caution.

How long will the weir pool manipulations last?

The weir pool water level manipulations are planned to last approximately 8 to 12 weeks during winter/spring 2017.

What will we see after the weir pool manipulation events?

After manipulating water levels at Locks 2, 5 and 6 you may observe a change in the extent and condition (health) of vegetation along the river channel and in the adjoining wetlands. Some vegetation will respond quickly to the conditions, but greater and more valuable vegetation response will result from longer term improvements to river management, including repeated weir pool manipulations over many years.

Will there be any other weir pool manipulation events planned for the future?

Yes, we expect to undertake more weir pool manipulation events for other weir pools in future years.

In future, it is planned that routine river operations will involve both weir pool raising and lowering to mimic some of the variability in water levels that occurred under natural conditions. When deciding on the extent of weir pool raising or lowering, the considerations include:

- The operational constraints of the weir;
- Consideration of impacts on water quality and river users;
- Requirements under the Basin Plan;
- The flows in the river at the time; and
- Potential impacts on infrastructure in the chosen river reach.

What else should I be aware of?

If flows in the River Murray reach 20 GL per day and conditions remain favourable, there is also the potential for Lock 6 to be raised by up to a maximum of 0.62 m above normal pool level in conjunction with possibly more testing of the Chowilla environmental regulator. Depending on River Murray flows and availability of environmental water, this operation of the regulator and Lock 6 could occur between August and December (2017).

More information about the potential operation of the Chowilla Environmental Regulator and Lock 6 weir pool raising can be found at: www.environment.sa.gov.au/chowilla-floodplain.

How can I keep up to date on the weir pool manipulation project?

The easiest way is to email samdbenquiries@sa.gov.au. We will send you an email about how the project is tracking and let you know when there are changes to the planned the water level manipulation and when the water level begins to be returned to normal. We will also keep the media and our website updated at www.naturalresources.sa.gov.au/weirpools and the WaterConnect website has real time river flow information, www.waterconnect.sa.gov.au.

