

Water quality update for Menindee Incident

Darling River and Menindee Lakes

Discharge in the Darling River and Tallyawalka Creek at Wilcannia is 1,316 and 962 ML/day respectively. Dissolved oxygen levels at Wilcannia are dropping below the 4 mg/L safe threshold for fish health over night but improving above 6 mg/L during the day (Figure 1). As a general guide, native fish and other large aquatic organisms require at least 2 mg/L of dissolved oxygen to survive but may begin to suffer if levels are below 4 to 5 mg/L for prolonged periods.

Dissolved oxygen levels drop overnight when respiration (microbes and animals breathing oxygen) outpaces oxygen replenishment (photosynthesis from aquatic plants and algae) that occurs during the day.

Water temperature at Wilcannia has stabilised at around 27°C. The amount of dissolved oxygen water can hold decreases with increasing water temperature which can add additional stress to fish that may already be struggling.

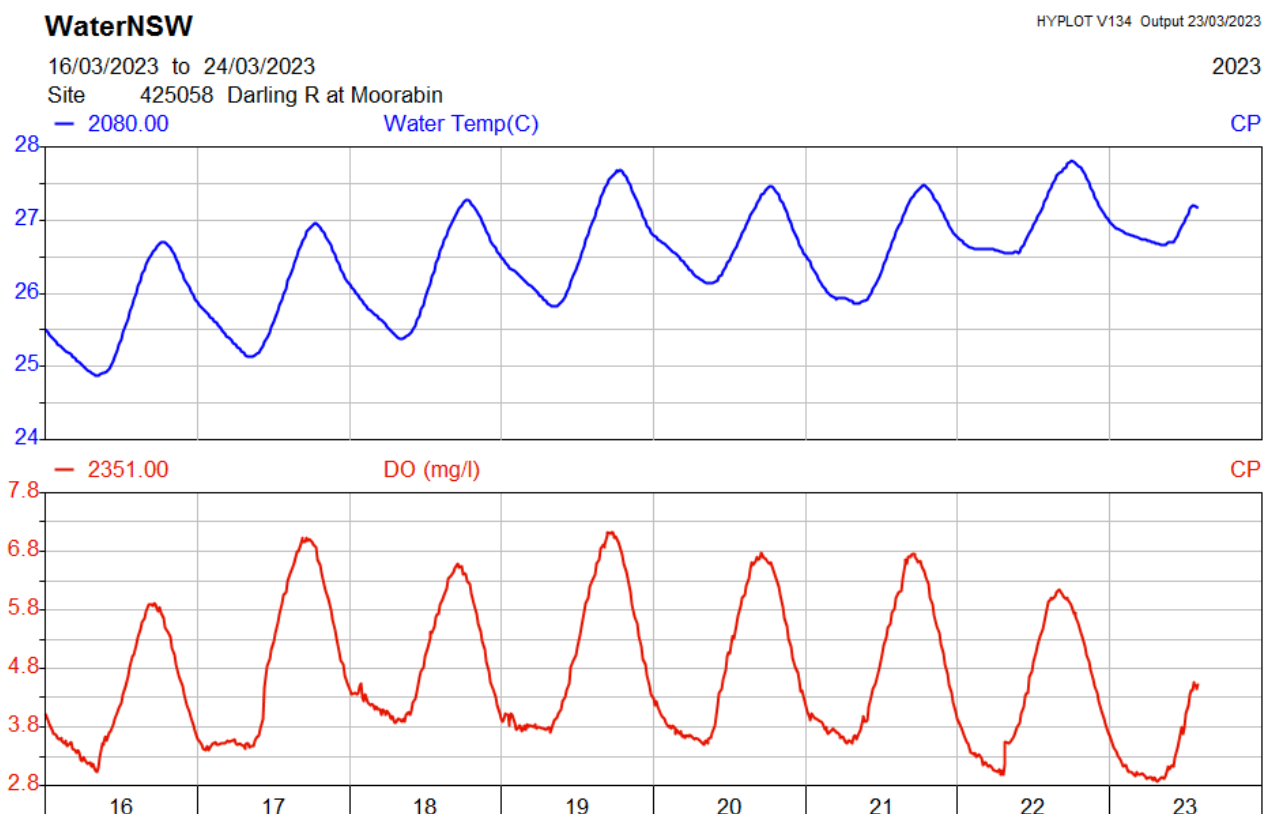


Figure 1: Continuous dissolved oxygen (mg/L) and water temperature (°C) in the Darling River at Wilcannia (Moorabin)

The continuous dissolved oxygen monitoring site in the upper reaches of Lake Wetherell at Nelia Gaari is also showing oxygen is dropping to critical levels overnight and then recovering during the day (Figure 2).

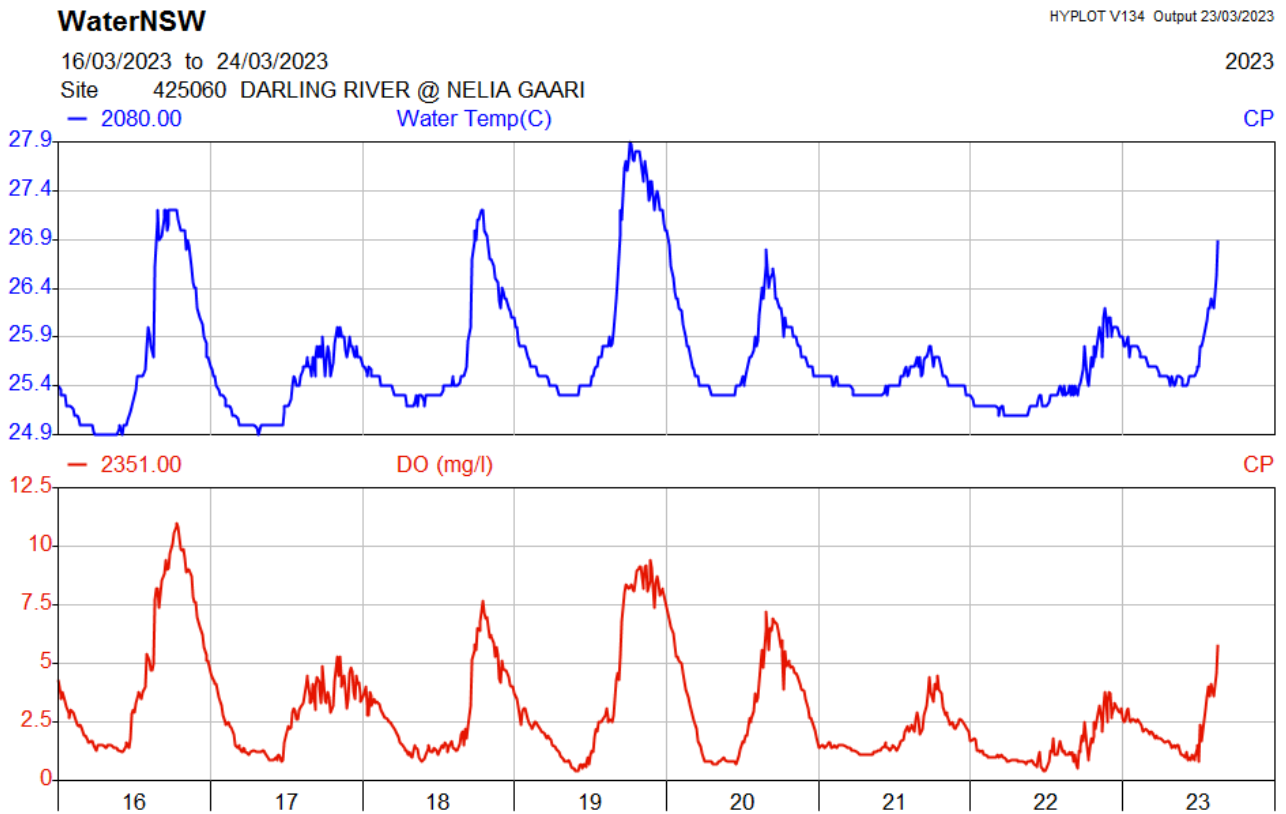


Figure 2: Continuous dissolved oxygen (mg/L) and water temperature (°C) in the Darling River at Nelia Gaari

Planet satellite imagery taken on 19 March showed an accumulation of dead fish upstream of the junction of the Darling River and Menindee Creek. Figure 3 is an image taken on 21 March which shows the accumulation of dead fish has dispersed. There still appears to be dead fish concentrating along the banks in some areas.



Figure 3: Planet satellite image from 21 March 2023 showing the accumulation of dead fish that was at the junction of the Darling River and Menindee Creek has been dispersed

Figure 4 is a Planet satellite image showing the Darling River and Menindee Lakes at Menindee on 22 March. Dissolved oxygen monitoring results (mg/L) collected near the water surface by WaterNSW 22 March are shown on Figure 4. Figure 5 shows the dissolved oxygen data collected at the same sites on 23 March.

Dissolved oxygen in the water being released from lakes Pamamaroo and Menindee is above the safe threshold for fish health (4 mg/L).

The lowest readings are in the Darling River from the railway bridge down to the junction of the Darling River and Menindee Creek. These low dissolved oxygen results indicate that there is still a risk of further fish deaths in this area and downstream. The readings taken near the surface indicate there is some oxygen replenishment from the atmosphere. However, readings taken deeper in the water column show oxygen levels quickly drop below 2 mg/L at around 50 cm.

The Pamamaroo inlet regulator has been opened to allow the water levels between lakes Wetherell and Pamamaroo to even out. The green coloured water in the imagery can be seen pushing out into the turbid water of Lake Pamamaroo. Ongoing monitoring will identify if this low oxygen water is once again being drawn into the Pamamaroo outlet.

Monitoring is showing that releases from Lake Menindee are diluting the low oxygen water coming down the Darling River through Menindee town. It is also showing that turbulence from the high flow velocity is mixing oxygen through the whole water column. The dissolved oxygen results from upstream of Weir 32 are higher than the readings from the continuous sensor at the gauging station (Figure 6). The sensor at Weir 32 is set at a fixed depth near the bottom of the weir pool. Oxygen levels can be higher near the water surface than at the very bottom of pools.

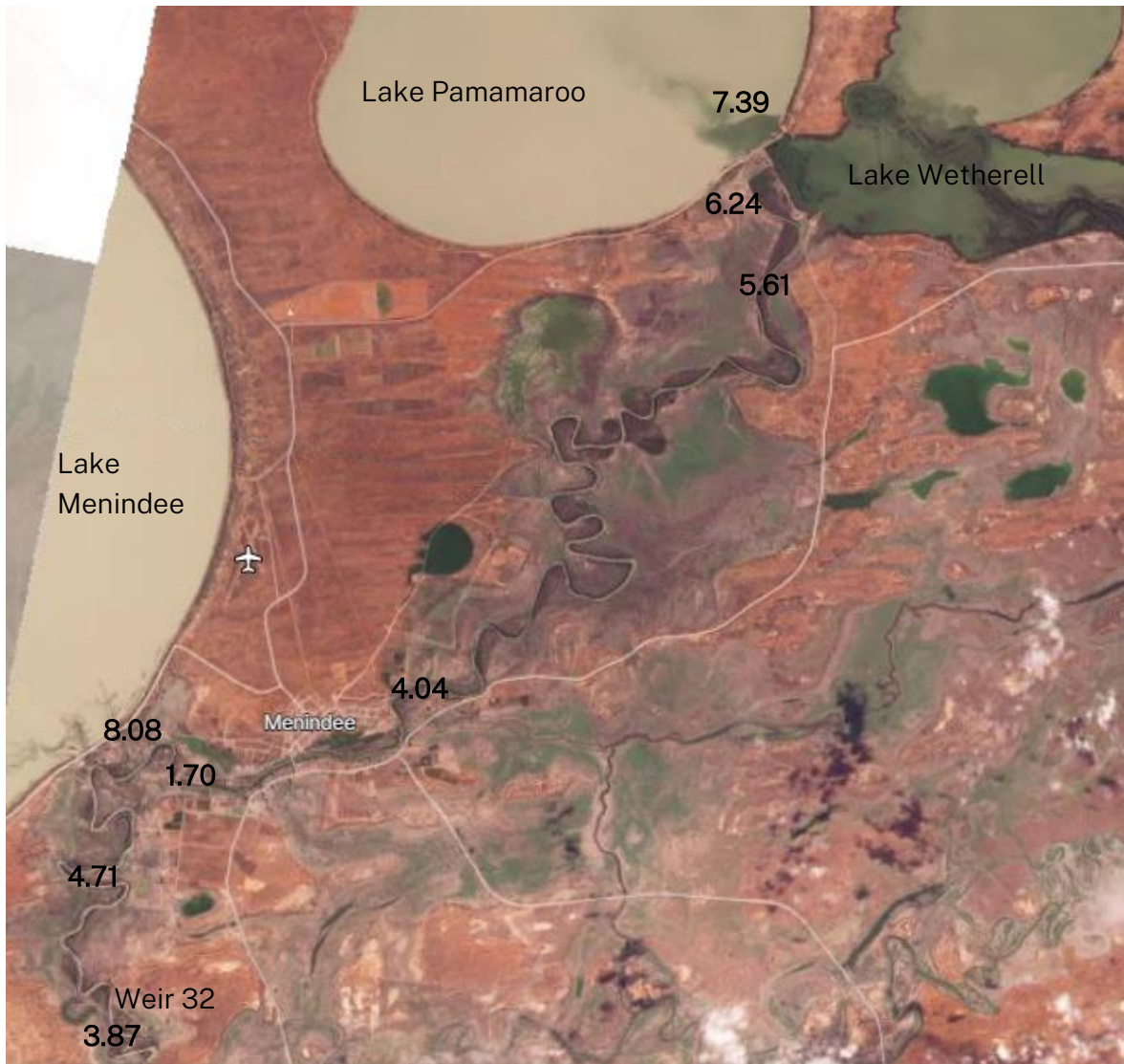


Figure 4: Planet satellite image – Image 21 March. Dissolved oxygen data collected 22 March (mg/L)

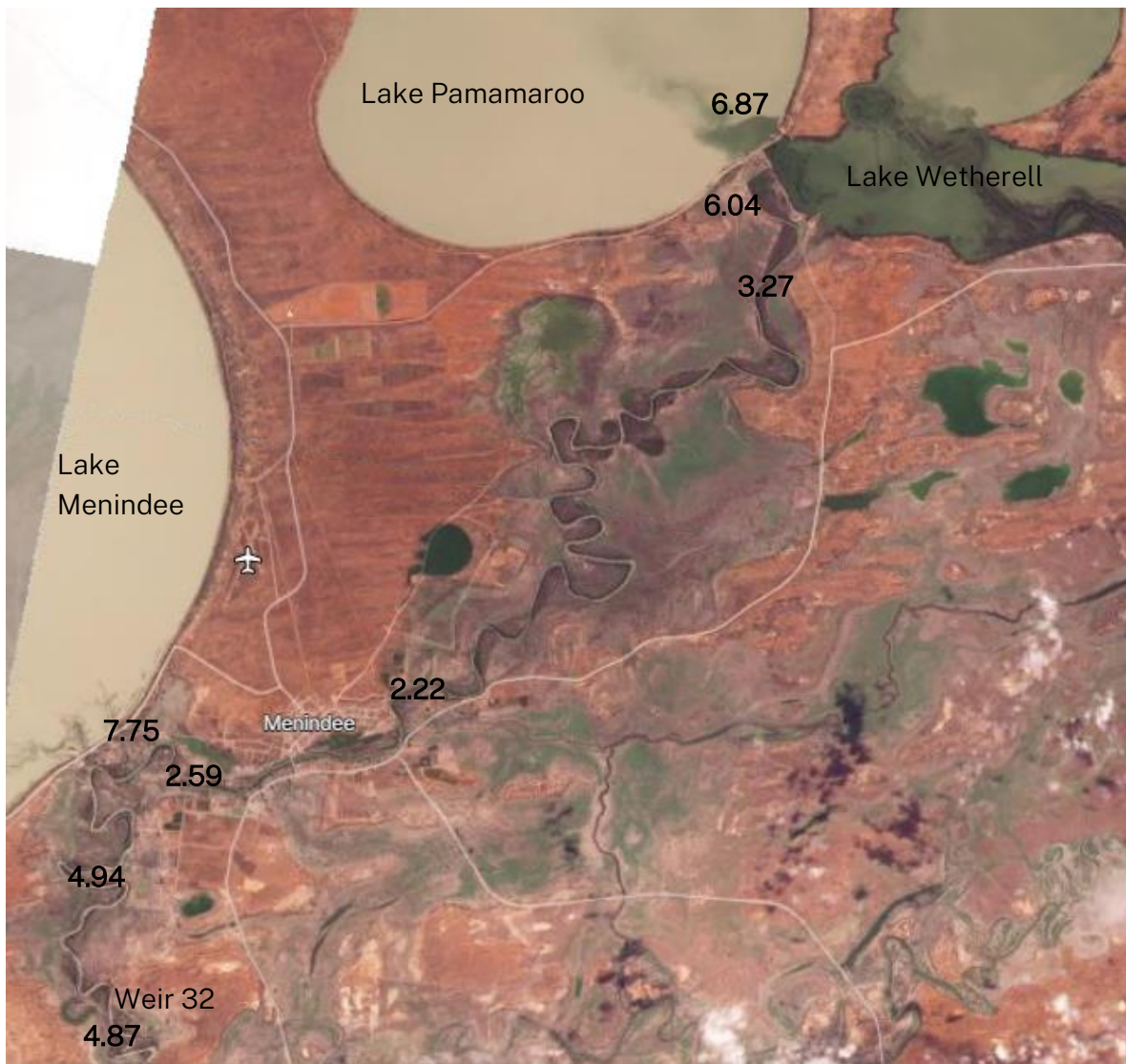


Figure 5: Planet satellite image – Image 21 March. Dissolved oxygen data collected 23 March (mg/L)

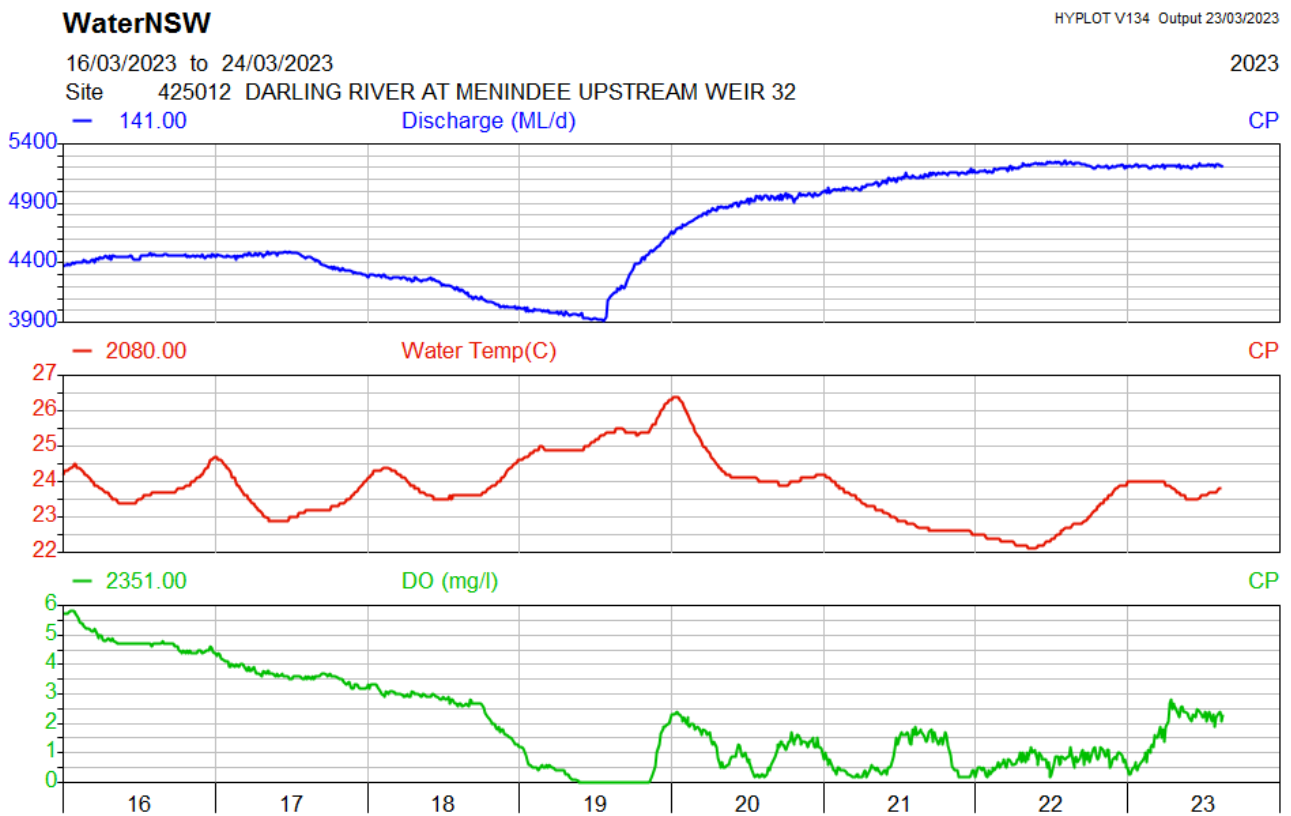


Figure 6: Continuous discharge (ML/day), dissolved oxygen (mg/L) and water temperature (°C) in the Darling River at Weir 32

Discharge in the Darling River at Pooncarie has declined to 6,354 ML/day and 6,548 ML/day at Burtundy. Data collected by NSW Fisheries on 21 March indicates low dissolved oxygen levels persist in the lower Darling River between Weir 32 and Pooncarie as low oxygen water makes its way downstream.

Results from the continuous dissolved oxygen sensor at Burtundy had been low. Routine maintenance resulted in dissolved oxygen readings jumping up to around 3.5 mg/L (Figure 7). These readings are more in line with data collected near the water surface with hand held meters. However, results through this stretch of the lower Darling River are still below the safer level for fish health of 4 mg/L.

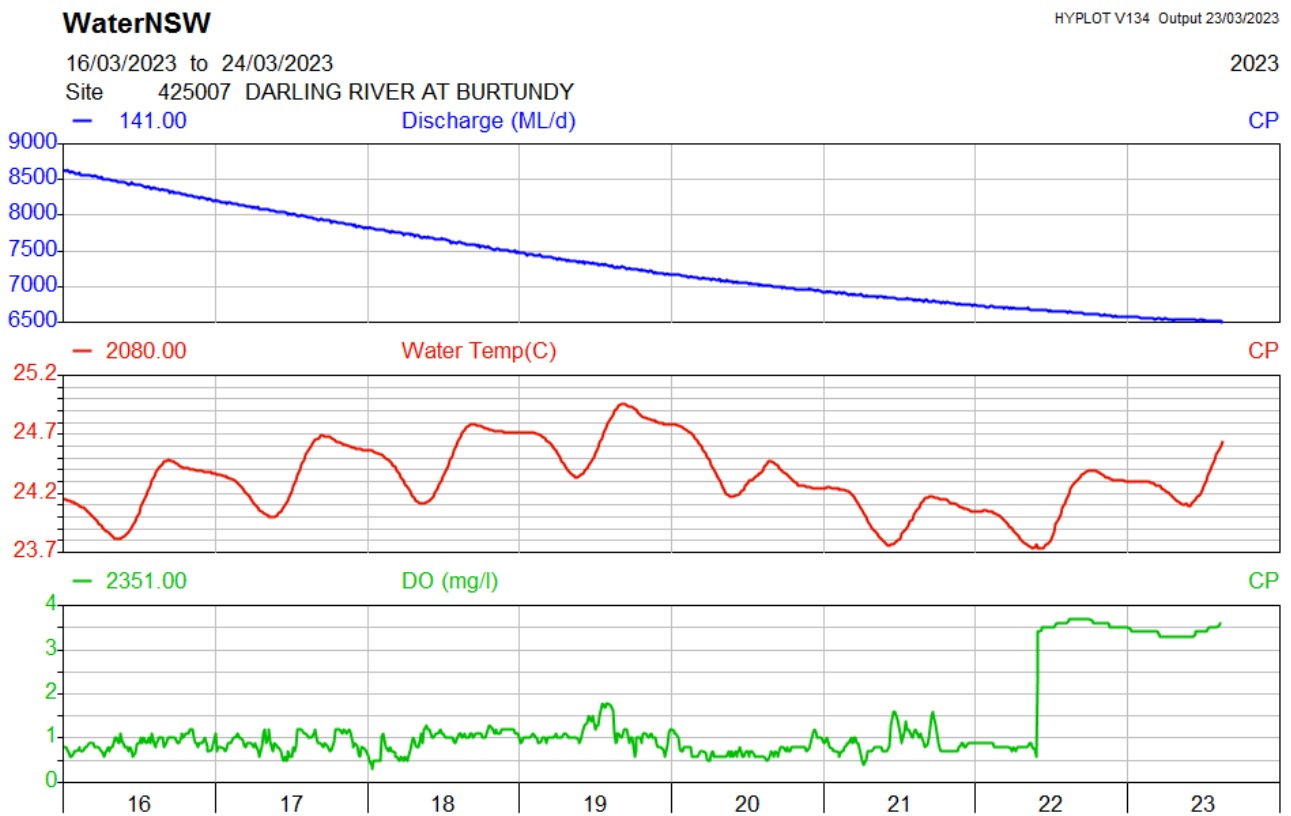


Figure 7: Continuous discharge (ML/day), dissolved oxygen (mg/L), water temperature (°C) in the Darling River at Burtundy

Weather Outlook

The Bureau of Meteorology 8-day total rain forecast (23 to 30 March) indicates very light rainfall in western NSW with higher falls along the coast (Figure 8). Forecast is for maximum air temperatures at Menindee to remain around 30°C over the weekend and decrease to the low 20's early next (Figure 9). There are no heatwave conditions forecast by the Bureau of Meteorology.

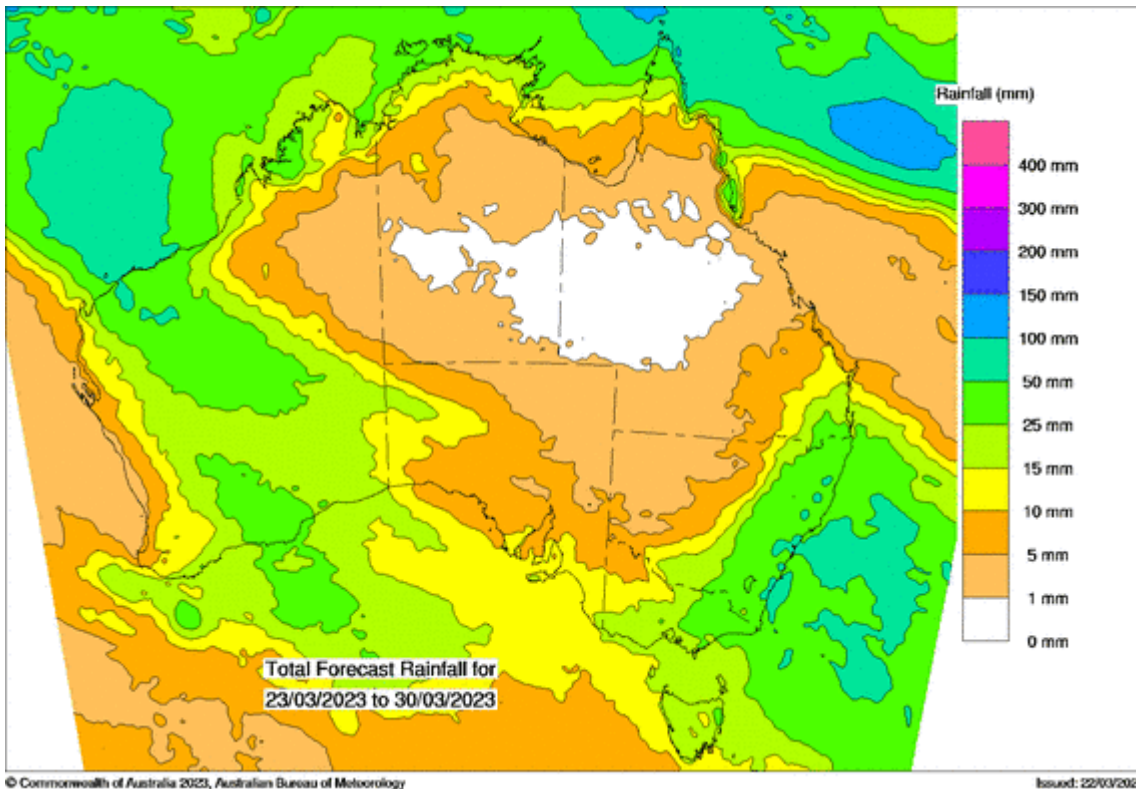


Figure 8: Bureau of Meteorology 8-day total rain forecast (23 to 30 March)








	THU Mar 23	FRI Mar 24	SAT Mar 25	SUN Mar 26	MON Mar 27	TUE Mar 28	WED Mar 29
Summary	 Sunny	 Mostly sunny	 Mostly sunny	 Mostly cloudy	 Late shower	 Mostly cloudy	 Clearing shower
Maximum	34°C	30°C	29°C	31°C	29°C	25°C	23°C
Minimum	19°C	15°C	14°C	13°C	20°C	16°C	11°C
Chance Of Rain	5%	5%	5%	20%	40%	30%	40%
Rain Amount	< 1mm	< 1mm	< 1mm	< 1mm	1-5mm	1-5mm	< 1mm

Figure 9: Forecast air temperatures for Menindee – 23 to 29 March