



Monday, November 28, 2022

Hume Dam

Hume Dam (Bowna Arm) is on Red Alert, while the four other stations located in the main body of the storage remain on Amber Alert level.

Algal status for the Murray/Edward/Wakool Rivers and Menindee Lakes including the lower Darling River

Amber alerts remain current for Hume Dam at Heywood's Bay, Ebdon and Hume Resort and downstream on the Murray River at Picnic Point. Also, amber alerts are in place for the Edward River at Deniliquin and the Gulpa Creek at Mathoura.

Low (twenty-one green alerts) to no cyanobacteria to report elsewhere.

Flood update for the Murray and Sunraysia

Minor flooding is occurring at Albury and Yarrawonga. Moderate flooding is occurring Corowa and Tocumwal.

Major flooding is occurring at Wakool Junction and **Boundary Bend** (Figure 3 satellite image captured 24.11.2022). Moderate flooding is occurring at Euston, Mildura, and **Wentworth** (Figure 3 and 4). A prolonged peak is possible at Mildura, with the river level remaining near 38.30 m AHD through to 18-20 December. A prolonged peak is also possible at Wentworth, with the river level remaining near the major flood level (33.88 m AHD) through to 19-21 December 2022.

Along the **Edward River**, moderate flooding is occurring at Deniliquin and Stevens Weir. Major flooding is occurring at Moulamein. The river level at Deniliquin peaked near 9.19 metres on Tuesday 22 November, with moderate flooding. Downstream at Moulamein, renewed rises from the Edward River combined with inflows from Billabong Creek have caused record major flooding.

Moderate flooding is occurring along the **Darling River** at Menindee. Minor flooding is occurring at Pooncarie, with moderate flooding possible. Minor flooding is occurring at Burtundy, with major flooding possible. The Darling River at Burtundy may reach the major flood level (7.70 m) early to mid-December (7-8 December). The river level is likely to remain around the major flood level until late December.

(Source: [Bureau flood warnings 28NOV2022](#)).

Blackwater/Hypoxic conditions in the Murray and Edward/Wakool systems

The Murray River at Barham had dropped to < 1 mg/L however, over the past 7 days DO has improved slightly. Monitoring further downstream at Boundary Bend is showing similar results. The Murray River at Wemen (downstream of Robinvale) has increased to around 3 mg/L. The results from the temporary deployed monitoring site on the Murray River, that is downstream of Wentworth dropped to 0.2 mg/L at 6:00 on 28.11.2022, and the lowest value since the site was installed on 18.10.2022. Dissolved oxygen levels have improved above 2 mg/L in the Wakool River at Gee Gee Bridge but remain below 2 mg/L at Stoney Crossing. On the Edward at Deniliquin continuous DO logging shows there has been a decrease in dissolved oxygen to 1.3 mg/L. DO immediately upstream of Menindee Lakes is currently measuring 4.4 mg/L (Source: NSW DO update No 8).

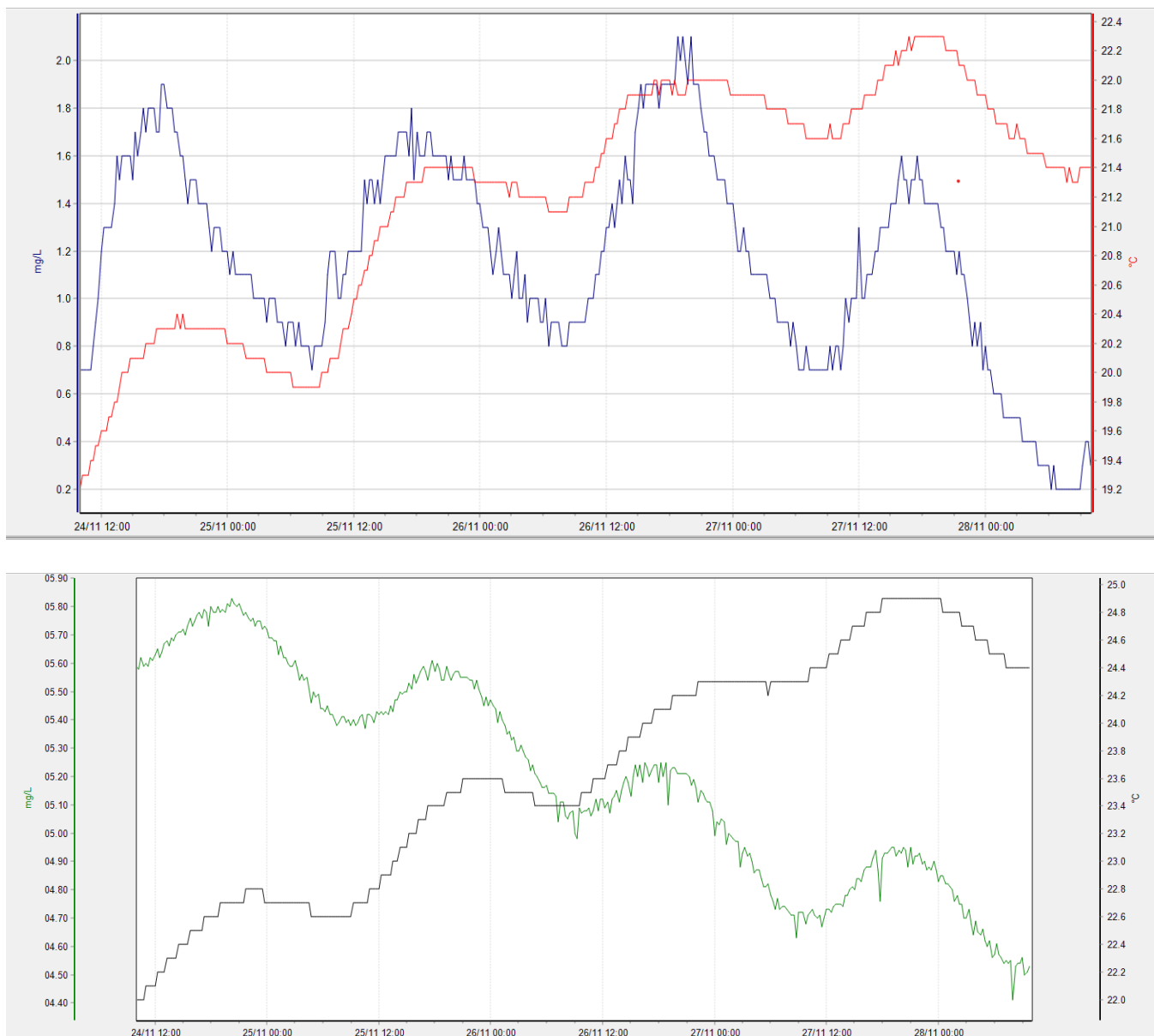


Figure 1 Hydrotel plots from the two in situ temporary stations deployed to monitor blackwater/hypoxic conditions. (top) D/S Wentworth on the Murray River showing a reduction in DO=0.3 mg/L over the past 24 hours while water temp = 21.4 DegC and (below) on the Darling River at Nelia Garri U/S Menindee Lakes (DO=4.5 mg/L, water temp=24.5 DegC)

Long-range forecast overview (issued 24 November 2022)

- December to February rainfall is likely (greater than 60% chance) to be above median for the southern New South Wales.
- December to February maximum temperatures are likely to be below median temperatures central and eastern New South Wales while minimum temperatures are **likely to very likely** (> 60% to > 80% chance) to be warmer than median.

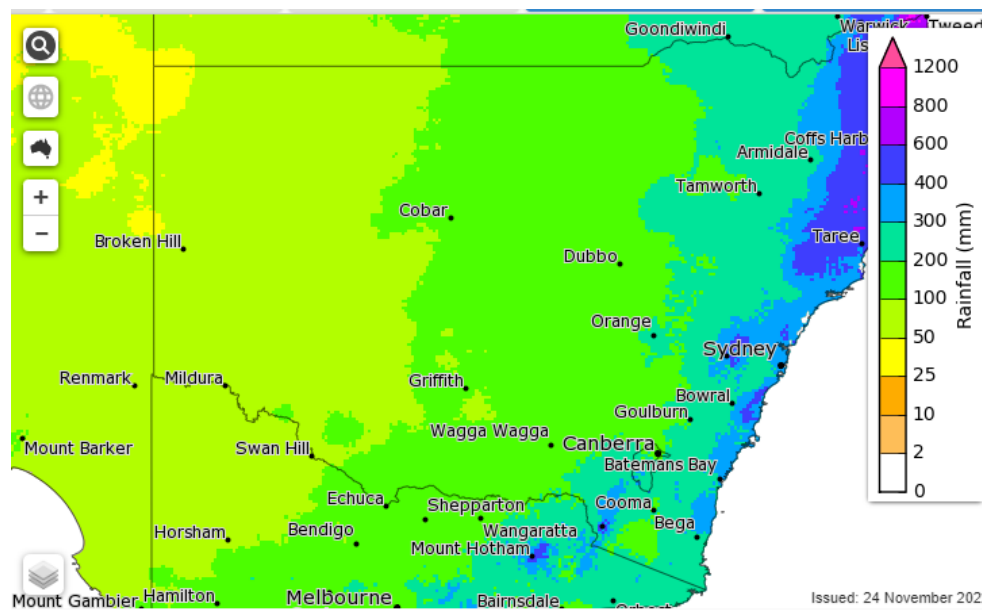


Figure 2 December '22 to February '23 Rainfall totals (>50% chance) (Source: <http://www.bom.gov.au/climate/outlooks/#/rainfall/total/50/seasonal/0>)

Riverina/Murray Forecast (7 days)

A high-pressure system moving over the Bight extends a ridge across southern New South Wales. Partly cloudy to sunny conditions, with the chance of a thunderstorm later in the week. Overnight temperatures falling to around 10 with daytime temperatures reaching the high 20s. (Source: <http://www.bom.gov.au/nsw/forecasts/riverina.shtml>)

Algal outlook

Low likelihood of increased algal growth while river discharge remains high and temperatures are relatively low.

See, Table 1 below for lates BGA results.

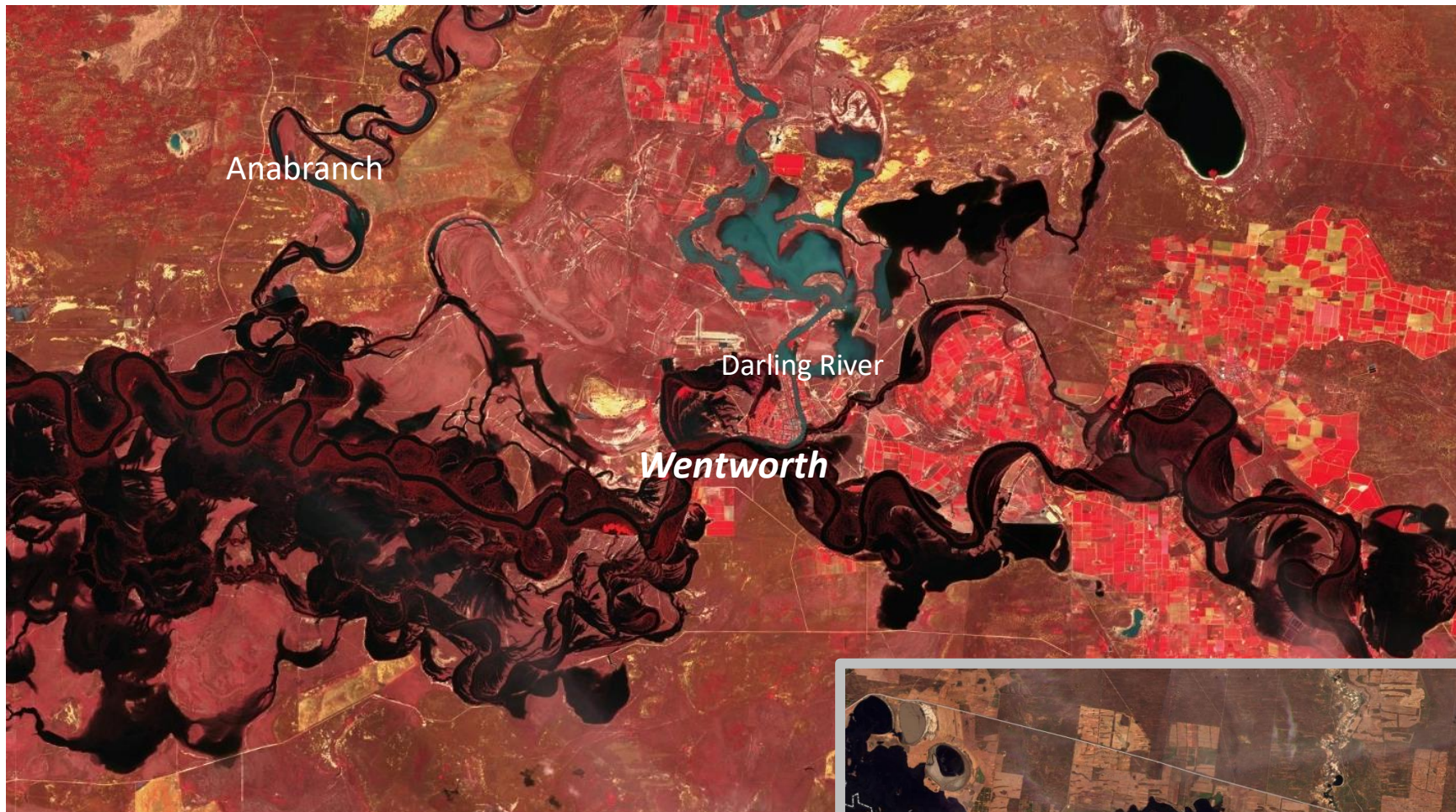


Figure 3 (Above) Sentinel 2 (False Colour) image of the lower Darling (blue grey coloured water) and Murray River (black) captured 24.11.2022, (right inset) Planet Lab (scope RGB) image from 24.11.2022

Murrumbidgee/Murray River confluence at Boundary Bend U/S Mildura

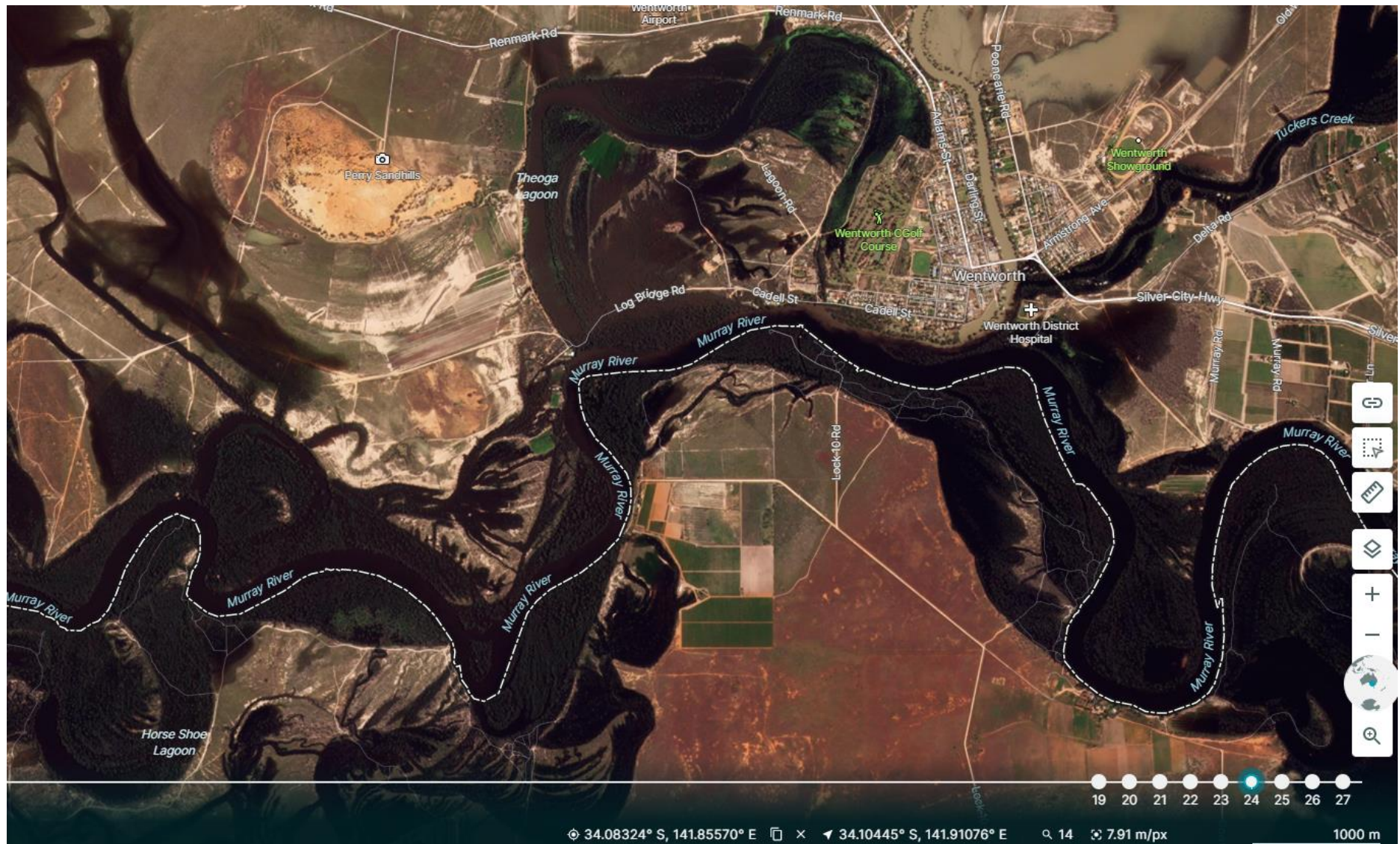


Figure 4 Planet Lab imagery captured 24.11.2022 RGB showing the confluence of Murray/Darling River at Wentworth *Darling River is typical turbid water currently

Table 1 Murray and Sunraysia Cyanobacteria Alerts 28 November 2022

Site	Description	Latest Sample Date	Cyanobacteria Total Count (cells/mL)	Cyanobacteria Biovolume (mm ³ /L)	Potentially Toxic Count (cells/mL)	Potentially Toxic I Biovolume (mm ³ /L)	Current Status (based on Latest Sample)	Previous Status	Cyanobacteria dominant potentially toxic taxa	Comments
MURRAY RIVER SYSTEM										
DLH001	Lake Hume, Heywood's Bay nr Bethanga	14/11/2022	59,012	1.289	2,378	0.105	AMBER	AMBER	<i>Microcystis Unknown 2</i>	Potentially toxic, taste & odour
DLH002	Lake Hume, Hume Dam Resort	14/11/2022	53,474	1.203	2,102	0.081	AMBER	AMBER	<i>Microcystis Unknown</i>	
DLH003	Lake Hume, Ebdon	14/11/2022	58,951	3.520	747	0.046	AMBER	AMBER	<i>Microcystis Unknown 2</i>	Potentially toxic, taste & odour
DLH004	Lake Hume, Bowna Arm	14/11/2022	27,806	0.652	2,586	0.121	AMBER	AMBER	<i>Microcystis Unknown</i>	Potentially toxic, taste & odour
DLH010	Lake Hume, Dam Wall	14/11/2022	47,708	11.533	4,411	0.245	RED	AMBER	<i>Dolichospermum sp.</i>	Potentially toxic, taste & odour
N1000	Murray R. Union Bridge Albury	7/11/2022	8,988	0.208	270	0.006	GREEN	AMBER	<i>Microcystis Unknown</i>	Potentially toxic, taste & odour
N1001	Murray R. Corowa	7/11/2022	6,250	0.145	899	0.037	GREEN	AMBER	<i>Microcystis Unknown</i>	Potentially toxic, taste & odour
Yarrowonga Weir GMW		7/11/2022	3,332	0.1			GREEN			
N1008	Mulwala Canal Offtake	7/11/2022	12,708	0.184	913	0.021	GREEN	AMBER	<i>Microcystis Unknown</i>	Potentially toxic, taste & odour

N1007	Murray R. @ below Yarrowonga	7/11/2022	2,158	0.169	138	0.003	GREEN	AMBER	<i>Microcystis Unknown</i>	Potentially toxic, taste & odour
N1051	Murray R. Cobram (Barooga)	7/11/2022	1,798	0.003			No Alert	GREEN		
N1013	Murray R. Tocumwal	7/11/2022	13,451	0.066			GREEN	GREEN		
N1052	Murray R. Picnic Point	4/10/2022	5,401	0.770			AMBER	AMBER		
N1050	Murray R. Moama (Echuca)	7/11/2022	119,091	0.143			GREEN	No Alert		
Torrumbarry Weir GMW		7/11/2022	12,509	0.2			GREEN			
N1003	Murray R. Barham (Koondrook)	9/11/2022	83,191	0.383			GREEN	AMBER		
N1054	Murray R. Murray Downs (Swan Hill)	8/11/2022	185,462	0.291			GREEN	GREEN		
N1064	Lake Benanee Rec Area	7/11/2022					No Alert	No Alert		
N1028	Murray R. Euston (Robinvale)	7/11/2022	128,912	0.194			GREEN	No Alert		
N1065	Murray R. Mount Dispersion	7/11/2022	38,341	0.061			GREEN	AMBER		
N1062	Murray R. Buronga	7/11/2022	41,771	0.066			GREEN	GREEN		
N1027	Murray R. Merbein	7/11/2022	149,801	0.221			GREEN	No Alert		
N1063	Murray R. Curlwaa	8/11/2022	25,345	0.041			GREEN	GREEN		
N1066	Murray R. Fort Courage	8/11/2022	144,774	0.230			GREEN	GREEN		
N1078	Lake Victoria Outlet Regulator	8/11/2022	41,881	0.026			No Alert	No Alert		
BILLBONG CREEK, EDWARD & WAKOOL RIVERS										
N1020	Billabong Ck. Walbundrie	7/11/2022	415	0.004			No Alert	No Alert		
N1006	Gulpa Ck. Mathoura	7/11/2022	327,209	0.702			AMBER	No Alert		
N1002	Edward R Deniliquin	7/11/2022	155,987	0.461			AMBER	No Alert		
N1053	Edward R. Old Morago	8/11/2022	123,741	0.372			GREEN	GREEN		

N1005	Edward R. Moulamein	8/11/2022	69,977	0.100			GREEN	No Alert		
N1010	Wakool R. Wakool-Barham Road	9/11/2022	68,850	0.240			GREEN	No Alert		
N1004	Wakool R. @ Stoney Crossing	8/11/2022	55,510	0.114			GREEN	No Alert		
N1009	Wakool R. Kyalite	8/11/2022	100,642	0.170			GREEN	No Alert		
MENINDEE LAKE SYSTEM & LOWER DARLING RIVER										
N1087	Lake Wetherell Site 1	26/10/2022	830				No Alert	No Alert		
N1088	Lake Wetherell Site 2	26/10/2022	1,728				No Alert	No Alert		
N1089	Lake Wetherell Station 3	26/10/2022	0				No Alert	No Alert		
N1090	Lake Wetherell Site 4	26/10/2022	899				No Alert	No Alert		
N1091	Tandure Lake Site 8	26/10/2022	0				No Alert	No Alert		
N1093	Pamamaroo Outlet / Regulator (Site 10)	26/10/2022	2,247				No Alert	No Alert		
N1094	Copi Hollow	27/10/2022	0				No Alert	No Alert		
N1086	Darling River at Menindee Weir 32	27/10/2022	830				No Alert	No Alert		
N1095	Darling River BHWB Pumping Station @ Menindee	26/10/2022	138				No Alert	No Alert		
N1128	Cawndilla Outlet	26/10/2022	415				No Alert	No Alert		
N1041	Darling River at Burtundy	8/11/2022	0				No Alert	No Alert		
N1043	Darling River at Tolarno	4/10/2022	415				No Alert	No Alert		
N1074	Darling River at Ellerslie	8/11/2022	5,676				No Alert	No Alert		
N1075	Darling River at Tapio	8/11/2022					No Alert	No Alert		

Alert Definitions for Recreational Waters

Alert Definitions as specified in The National Health and Medical Research Council (NHMRC) *Guidelines for Managing Risks in Recreational Water* 2008. The use of these guidelines is endorsed by the Scientific Subcommittee of the NSW Algal Advisory Group.

RED ALERT

These alert levels represent 'bloom' conditions. Water will appear green or discoloured and clumps or scums could be visible. It can also give off a strong musty or organic odour. Algae may be toxic to humans and animals. Contact with or use of water from red alert areas should be avoided due to the risk of eye and skin irritation. Drinking untreated or boiled water from these supplies can cause stomach upsets. Alternative water supplies should be sought or activated carbon treatment employed to remove toxins. People should not fish when an algal scum is present. Owners should keep dogs away from high alert areas and provide alternative watering points for stock.

AMBER ALERT

Blue-green algae may be multiplying, and the water may have a green tinge and musty or organic taste and odour. The water should be considered as unsuitable for potable use and alternative supplies or prior treatment of raw water for domestic purposes should be considered. The water may also be unsuitable for stock watering. Generally suitable for water sports, however people are advised to exercise caution in these areas, as blue-green algal concentrations can rise to red alert levels quickly under warm, calm weather conditions.

GREEN ALERT

Blue-green algae occur naturally at low numbers. At these concentrations, algae would not normally be visible, however some species may affect taste and odour of water even at low numbers and does not pose any problems for recreational, stock or household use.

Table 2 Description of the Alerts applied to Recreational Waters

<p>Red Alert</p> <p>≥ 50 000 cells/mL toxic <i>M. aeruginosa</i> OR biovolume equivalent of ≥4 mm³/L for the combined total of all cyanobacteria where a known toxin producer is dominant OR The total biovolume of all cyanobacteria exceeds 10 mm³/L OR Cyanobacterial blooms are consistently present</p>	<ul style="list-style-type: none"> • High levels of Blue Green Algae detected • Indicates "bloom" conditions • Toxicity should be presumed • Water will appear green or brownish and may have a strong musty taste and odour • Surface scums could occur <p>Extreme care should be exercised, and contact with the water should be avoided</p> <p><i>Action</i></p> <ul style="list-style-type: none"> • Issue Media Release • Water supply authorities to increase filtering with activated carbon as appropriate <p>Local authority and health authorities to warn the public that the water body is considered to be unsuitable for primary contact recreation</p>
<p>Amber Alert</p> <p>≥5000 to <50 000 cells/mL <i>M. aeruginosa</i> OR biovolume equivalent of ≥ 0.4 to < 4 mm³/L for the combined total of all cyanobacteria</p>	<ul style="list-style-type: none"> • Indicates blue-green algae are multiplying • Water may have a green tinge and musty taste and odour <p><i>Action</i></p> <ul style="list-style-type: none"> • Water supply authorities to consider filtering with activated carbon <p>Investigations into the causes of the elevated levels and increased sampling to enable the risks to recreational users to be more accurately assessed.</p>
<p>Green Alert</p> <p>> 500 to < 5000 cells/mL <i>M. aeruginosa</i> OR biovolume equivalent of > 0.04 to < 0.4 mm³/L for the combined total of all cyanobacteria</p>	<ul style="list-style-type: none"> • Low levels of potentially toxic species detected – suggesting base crop of blue green algae may be on the increase <p><i>Action</i></p> <p>Continue/increase routine sampling to measure cyanobacterial levels</p>

Livestock Drinking Water Guidelines Based on ARMCANZ (2000), Orr and Schneider (2006) and WQRA (2010)

This guideline should be used when water is used for livestock drinking water purposes.

- If visual scums are present, then a high alert should be declared. This would be applicable for both farm dams and publicly managed water bodies (streams, rivers). Such advice should also be given to farmers who phone the department seeking information on managing blooms in their dams.
- Where blooms dominated by ***Microcystis aeruginosa*** are present, then the ANZECC/ARMCANZ (2000) guideline of 11,500 cells/mL should be used. Excess of this cell count will constitute a **high alert**.
- Where blooms dominated by ***Dolichospermum circinale*** are present, then the Orr and Schneider (2006) guideline of 25,000 cells/mL should be used. Excess of this cell count will constitute a **high alert**.
- **Blooms of blue-green algae other** than *M. aeruginosa* and *D. circinale* are also common in NSW. These can be of either known potentially toxic species, or of species not considered to be toxin producers. When these blooms are present, a total blue-green algal biovolume in excess of 6 mm³/L will constitute a **high alert**. (These are based on very high alert recommendations for raw water sourced for potable human supply published by WQRA (2010), in lieu of there being nothing else available).

Further Information and Contacts

Go to the WaterNSW Algal Website

<http://www.watarnsw.com.au/water-quality/algae>

Contact

Liz Symes

elizabeth.symes@watarnsw.com.au

Mobile: 0439 199 077

Directly lodge a query for RACC coordinators across the state at, RACC@watarnsw.com.au