



CTENVIRONMENTAL

ECOSYSTEM MANAGEMENT AND MONITORING



October 2023 Monthly Aquatic Ecosystem Monitoring Report

Liverpool City Council

September 2023

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Aquatic Ecosystem Monitoring Monthly Progress Report - October 2023

Monthly aquatic ecosystem monitoring of the Georges River and South Creek catchments was undertaken on October 31, 2023.

This report provides a summary of recreation water quality indicators (Cyanobacteria, *Enterococci* and *Faecal Coliforms*) at Georges River recreation monitoring sites and observations from freshwater monitoring sites.

Badgerys Creek weather monitoring station is expected to be representative of weather conditions in the Kemps Creek catchment and Holsworthy Aerodrome station is expected to be representative of conditions in the locale of the Georges River monitoring sites.

Weather conditions during October sampling were warm to cool with 2.4 mm of rain recorded at Badgerys Creek AWS (Table 1) and 0.8 mm recorded at Holsworthy Aerodrome (Table 2) in the week prior to sampling.

Table 1: Weather observations for Badgerys Creek AWS, NSW (BOM 2023).

Date	Temp min (°C)	Temp max (°C)	Rainfall (mm)
25/08/2023	14.3	28.4	0
26/08/2023	11.3	18	0
27/08/2023	10.6	20.5	1.6
28/08/2023	8.7	22.7	0.8
29/08/2023	6.5	29.3	0
30/08/2023	9.3	35.6	0
31/08/2023	18.3	28.7	0

Table 2: Weather observations for Holsworthy Aerodrome (BOM 2023).

Date	Temp min (°C)	Temp max (°C)	Rainfall (mm)
25/08/2023	15.4	24.5	0
26/08/2023	12.9	-	0
27/08/2023	10.3	18.7	-
28/08/2023	7.8	20.9	0.8
29/08/2023	8.4	28.4	0
30/08/2023	9.1	34.6	0
31/08/2023	18.3	27.8	0

Blue Green Algae (Cyanobacteria) monitoring at recreation sites in the Georges River was undertaken on October 31, 2023, during the mid tide.

Results show that potentially toxic cyanobacteria were detected at one site during sampling at all Georges River sites (GR4) at a low volume, and biovolume calculations indicate that NHMRC (2008) Green Level Surveillance mode was triggered at two of the Georges River recreation monitoring sites (GR3 and GR4) (Table 3).

Table 3: Results summary for recreation monitoring sites, October 2023.

Site	Sampled	Potentially Toxic Blue Green Algae	NHMRC Alert Level	Safety Issues
GR1	Yes	Not detected	-	None
GR1.5	Yes	Not detected	-	None
GR2	Yes	Not detected	-	None
GR3	Yes	Not detected	Green	None
GR4	Yes	Not detected	Green	None
GR5	Yes	Not detected	-	None

Four species of cyanobacteria were recorded at GR1 which included *Anabaena* spp., *Aphanocapsa* spp., *Pseudanabaena* spp., and *Romeria* spp. Biovolume of these species were not detected at concentrations high enough to trigger an NHMRC (2008) alert.

Three species of cyanobacteria were recorded at GR1.5 which included *Cyanogranis libera*, *Pseudanabaena* spp., and *Romeria* spp. Biovolume of these species were not detected at concentrations high enough to trigger an NHMRC (2008) alert.

One species, *Romeria* spp, was recorded at GR2 and due to the low biovolume of this species no NHMRC (2008) mode was triggered.

GR3 recorded four species of cyanobacteria (*Aphanocapsa* spp., *Merismopedia* spp., *Pseudanabaena* spp., and *Romeria* spp.). Because of the biovolume of these species, NHMRC (2008) Green level Surveillance mode was triggered.

GR4 recorded four species of cyanobacteria (*Aphanocapsa* spp., *Merismopedia* spp., *Phormidium* spp., and *Pseudanabaena* spp.). Because of the biovolume of these species, NHMRC (2008) Green level Surveillance mode was triggered.

GR5 recorded no species of cyanobacteria. Because of this, no NHMRC (2008) mode was triggered.

Due to the persistence of cyanobacteria, there is potential for future blooms to occur. NHMRC (2008) recommends weekly or fortnightly monitoring if the 'Green' mode is triggered (Table 4).

Table 4: Recommended monitoring actions and corresponding NHMRC Alert Levels.

Blue Green Algae Alert Level	Recommended Actions
<i>Surveillance Mode (Green Level)</i>	<ul style="list-style-type: none"> Weekly sampling and cell counts at representative locations in the water body where known toxigenic species are present. Fortnightly for other types including regular visual inspection of water surface for scums.
<i>Alert Mode (Amber Level)</i>	<ul style="list-style-type: none"> Increase sampling frequency to twice weekly at representative locations in the water body where toxigenic species are dominant within the alert level definition (i.e. total biovolume) to establish population growth and spatial variability in the water body. Monitor weekly or fortnightly where other types are dominant. Make regular visual inspections of water surface for scums. Decide on requirement for toxicity assessment or toxin monitoring.
<i>Action Mode (Red Level)</i>	<ul style="list-style-type: none"> Continue monitoring as for alert mode. Immediately notify health authorities for advice on health risk. Make toxicity assessment or toxin measurement of water if this has not already been done. Health authorities warn of risk to public health (ie the authorities make a health risk assessment considering toxin monitoring data, sample type and variability).

Results of bacteria monitoring at recreation sites in October 2023 show that the ANZECC Primary Contact guidelines for *Faecal coliforms* was exceeded at GR1.5 and GR2, and Secondary Contact Guidelines for *Faecal coliforms* was exceeded at GR1. The ANZECC Secondary Contact guidelines for *Enterococci* was exceeded at GR1, and the ANZECC Primary Contact guidelines for *Enterococci* was exceeded at GR1.5, GR2, GR4, and GR5.

Table 5. Summary of conditions observed/recorded at each site during October 2023 monitoring. Orange indicates exceedance of the primary contact guideline; red indicates exceedance of the secondary contact guideline.

Recreation sites						
SITE	Sampled	Tide	<i>Faecal coliforms</i> CFU/100 mL	<i>Enterococci</i> CFU/100 mL	Safety Issues	Observations
GR1	Yes	N/A	2200	760	None	Clear
GR1.5	Yes	N/A	240	190	None	Clear
GR2	Yes	N/A	160	41	None	Clear
GR3	Yes	Mid	95	23	None	Clear
GR4	Yes	Mid	36	220	None	Clear
GR5	Yes	Mid	96	56	None	Clear
Primary Contact	-	-	150	35	-	-
Secondary Contact	-	-	1000	230	-	-

Surface water samples were collected at all freshwater monitoring sites in October 2023, except for KC11 (due to construction of a pipeline).

Table 6. Summary of conditions observed/recorded at each site during October 2023 monitoring.

Site	Water quality	Aquatic Macroinvertebrates	Benthic Diatoms	Flow	Observations	Safety Issues
MC1	Yes	No	No	Normal	Clear	None
AC1	Yes	No	No	Normal	Clear	None
KC1	Yes	No	No	Normal	Clear	None
KC2	Yes	No	No	Normal	Clear	None
KC3	Yes	No	No	Normal	Clear	None
KC5	Yes	No	No	Normal	Clear	None
KC6	Yes	No	No	Normal	Clear	None
KC8	Yes	No	No	Normal	Clear	None
KC10	Yes	No	No	Normal	Clear	None
KC11	No	No	No	-	-	No access due to construction
KC12	Yes	No	No	Normal	Clear	None
SC1	Yes	No	No	Normal	Clear	None
SC2	Yes	No	No	Normal	Clear	None
BC1	Yes	No	No	Normal	Turbid	None
WG	Yes	No	No	Normal	Clear	None
HC	Yes	No	No	Normal	Clear	None

All data has been supplied in an Excel spreadsheet separate to this report and no safety issues were recorded/observed during monitoring.

Statistical analysis of data collected by the monitoring program will be undertaken and presented in the annual report and program recommendations will be made.

The data from this report is reflected in the web reported supplied to Liverpool council.

If you have any questions, please get in touch.

Kind regards,

A handwritten signature in black ink, consisting of several overlapping loops and lines, resembling a stylized 'J' or 'T'.

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References

ANZECC & ARMCANZ (2000) Australian and New Zealand Guidelines for Fresh and Marine Water Quality, Australian and New Zealand Environment and Conservation Council and Agriculture and Resource Management Council of Australia and New Zealand, Canberra.

BOM (2023) www.bom.gov.au (accessed October 28, 2023).

NHMRC (2008) Guidelines for Managing Risks in Recreational Water