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ECOSYSTEM MANAGEMENT AND MONITORING



April 2023 Monthly Aquatic Ecosystem Monitoring Report

Liverpool City Council

April 2023

Project Liverpool Aquatic Ecosystem Monitoring 2023

Prepared For	Liverpool City Council
Authors	Benjamin Green (CTENVIRONMENTAL)
Reviewed by	Benjamin Green (CTENVIRONMENTAL)
Approved by	Carl Tippler (CTENVIRONMENTAL)
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422 Yabtree Road, Borambola, NSW, 2650

M: 0400 216 206

www.ctenvironmental.com.au

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Aquatic Ecosystem Monitoring Monthly Progress Report - April 2023

Monthly aquatic ecosystem monitoring of the Georges River and South Creek catchments was conducted on April 04, 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.

Prospect Dam 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 April sampling were warm to cool with 28mm of rain recorded at Prospect Dam monitoring station (Table 1) and 19.6mm recorded at Holsworthy Aerodrome (Table 2) in the week prior to sampling.

Table 1: Weather observations for Prospect Dam, NSW (BOM 2023).

Date	Temp min (°C)	Temp max (°C)	Rainfall (mm)
29/03/2023	N/A	N/A	7
30/03/2023	N/A	N/A	0
31/03/2023	N/A	N/A	0
01/04/2023	N/A	N/A	0
02/04/2023	N/A	N/A	11
03/04/2023	N/A	N/A	10
04/04/2023	N/A	N/A	0

*BOM March/April temperature data currently unavailable, temperatures would likely correspond to Holsworthy Aerodrome.

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

Date	Temp min (°C)	Temp max (°C)	Rainfall (mm)
29/03/2023	18.2	27.2	4.6
30/03/2023	13.6	24.1	1.4
31/03/2023	10.6	25.3	0
01/04/2023	11.1	19	0
02/04/2023	13.9	21	7.6
03/04/2023	14	23.3	6
04/04/2023	13	25	0

Blue Green Algae (Cyanobacteria) monitoring at recreation sites in the Georges River was undertaken on April 04, 2023, during mid tide.

Results show that potentially toxic cyanobacteria were not detected during sampling at all Georges River sites and biovolume calculations indicate (Table 3).

- NHMRC Surveillance Mode (Green Level) was triggered at the recreation monitoring sites GR1, GR1.5, GR2, and GR5 (Table 3).
- NHMRC Alert Mode (Amber Level) was triggered at the recreation monitoring sites GR4 and GR4

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

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

GR1 recorded six species of cyanobacteria, *Anathece spp.*, *Aphanocapsa spp.*, *Cyanogranis libera*, *Cyanonephron spp.*, *Merismopedia spp.*, and *Rhabdoderma spp.* Due to the biovolume of these species, the NHMRC (2008) Green Level surveillance mode was triggered.

GR1.5 recorded seven species of cyanobacteria, *Anathece spp.*, *Aphanocapsa spp.*, *Cyanogranis libera*, *Merismopedia spp.*, *Pseudanabaena spp.*, *Rhabdoderma spp.*, and *Synechococcus spp.* Due to the biovolume of these species, the NHMRC (2008) Green Level surveillance mode was triggered.

GR2 recorded four species of cyanobacteria, *Aphanocapsa spp.*, *Cyanogranis libera*, *Merismopedia spp.*, and *Pseudanabaena spp.* Due to the biovolume of these species, the NHMRC (2008) Green Level surveillance mode was triggered.

GR3 recorded five species of cyanobacteria, *Anathece spp.*, *Aphanocapsa spp.*, *Cyanogranis libera*, *Merismopedia spp.*, and *Pseudanabaena spp.* Due to the large biovolume of these species, the NHMRC (2008) Amber Level alert mode was triggered.

GR4 recorded five species of cyanobacteria, *Aphanocapsa spp.*, *Cyanogranis libera*, *Merismopedia spp.*, *Pseudanabaena spp.*, and *Synechococcus spp.* Due to the large biovolume of these species, the NHMRC (2008) Amber Level alert mode was triggered.

GR5 recorded four species of cyanophytes, *Aphanocapsa spp.*, *Cyanogranis libera*, *Merismopedia spp.*, and *Pseudanabaena spp.* Due to the biovolumes of these species, 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 when 'Green' mode is triggered (Table 4).

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

Blue Green Algae Alert Level	Recommended Actions
Surveillance Mode (Green Level)	<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.
Alert Mode (Amber Level)	<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.
Action Mode (Red Level)	<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 April 2023 show that the ANZECC Primary Contact guidelines for *Faecal coliforms* was exceeded at GR1, GR1.5, GR2, and GR3, and the ANZECC Secondary Contact guidelines for *Faecal coliforms* was exceeded at GR4 and GR5. The ANZECC Primary Contact guidelines for *Enterococci* was exceeded at GR1, GR1.5, GR2, and GR3. The ANZECC Secondary Contact guidelines for *Enterococci* was exceeded at GR4 and GR5.

Table 5. Summary of conditions observed/recorded at each site during April 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	400	70	None	Clear
GR1.5	Yes	N/A	530	170	None	Clear
GR2	Yes	N/A	220	60	None	Clear
GR3	Yes	Mid	710	30	None	Clear
GR4	Yes	Mid	1200	1000	None	Clear
GR5	Yes	Mid	14000	660	None	Clear
Primary Contact	-	-	150	35	-	-
Secondary Contact	-	-	1000	230	-	-

Surface water samples and benthic diatoms were collected at all freshwater monitoring sites in April 2023, except for KC11 (due to construction of a pipeline) and KC5 (due to elevated flow which did not allow access to the site).

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

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

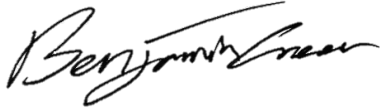
All data has been supplied in an Excel spreadsheet separate to this report and no safety issues were recorded/observed during monitoring apart from the elevated flow which did not allow site access at KC5.

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,



Benjamin Green

Ecologist – Aquatic and Riparian Specialist

0476 240 148

ben@ctenvironmental.com.au

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 April 28, 2023).

NHMRC (2008) Guidelines for Managing Risks in Recreational Water