2017–2018 Updated Cockburn Sound Environmental Quality Criteria

Chlorophyll *a* and Light Attenuation Coefficient

The Environmental Quality Criteria (EQC) for chlorophyll *a*, light attenuation coefficient (LAC) and phytoplankton biomass are based on 'rolling' percentiles and are re-calculated and updated each year using the monitoring results collected at the Warnbro Sound Reference Site (WS4) during the current year and the five previous summers so that the EQC are calculated from a database of approximately 100 values and remain contemporary.

For the 2017–2018 non river-flow period, the chlorophyll *a* and light attenuation coefficient annual medians at the Warnbro Sound Reference Site (WS4) were between their respective historical ranges (Table 1). The 2017–2018 data were therefore included in the re-calculation of the Environmental Quality Guidelines (EQG) (Table 2).

Table 1. Assessment of the 2017–2018 chlorophyll *a* concentration and light attenuation coefficient (LAC) medians against the 20th and 80th percentiles of the WS4 historical dataset

	Chlorophyll *a* (micrograms per litre [µg/L])	LAC (log_{10} m^{-1})
Historical dataset 20th percentile	0.400	0.066
Historical dataset 80th percentile	0.900	0.091
2017–2018 median	0.650	0.076
Assessment	Met criteria specified in the *Environmental Quality Criteria Reference Document for Cockburn Sound* (EPA 2017)	Met criteria specified in the *Environmental Quality Criteria Reference Document for Cockburn Sound* (EPA 2017)
	2017–2018 data included in the 2017–2018 EQG calculations	

Table 2. The 2017–2018 high protection and moderate protection EQG for chlorophyll *a* concentration and light attenuation coefficient (LAC)

Indicator	High Protection rolling 6-year 80th percentile	Moderate Protection rolling 6-year 95th percentile
Chlorophyll *a* (µg/L)	1.100	1.800
LAC (log_{10} m^{-1})	0.096	0.114

Phytoplankton Biomass

The re-calculated EQC for phytoplankton biomass are presented in Table 3.

Table 3. The 2017–2018 high protection and moderate protection EQC for phytoplankton biomass

	High Protection Rolling 6-year median	Moderate Protection Rolling 6-year 80th percentile
Chlorophyll *a* (µg/L)	0.70	1.10
Conversion factor[1]	x 3	x 3
EQG	2.10	3.30

Seagrass Shoot Density

The Environmental Quality Standards (EQS) for *Posidonia sinuosa* shoot density are based on 'rolling' four-year percentiles and are re-calculated and updated each year using the monitoring results for each monitored depth at the Warnbro Sound reference site. The EQS for each depth are presented in Table 4.

Table 4. The 2018 high protection and moderate protection EQS for seagrass shoot density

Reference Site	Number of quadrats	Rolling 4-year 20th percentiles of seagrass shoot density (shoots/m^2)	Rolling 4-year 5th percentiles of seagrass shoot density (shoots/m^2)	Rolling 4-year 1st percentiles of seagrass shoot density (shoots/m^2)
Warnbro Sound 2.0 m	38	500	299	71
Warnbro Sound 2.5 m	94	475	133	48
Warnbro Sound 3.2 m	73	260	75	25
Warnbro Sound 5.2 m	96	400	269	195
Warnbro Sound 7.0 m	86	100	50	25

Notes:

(1) Quadrats have been lost at some sites due to sediment scouring. A reduced number of quadrats were therefore used to calculate the 'rolling' four-year percentiles.

(2) The 'rolling' four-year percentiles for Warnbro Sound 3.2 m are calculated using the data from five transects.

[1] The *Environmental Quality Criteria Reference Document for Cockburn Sound* (EPA 2017) sets out that the EQC is three times the median chlorophyll *a* concentration of the reference site for high ecological protection areas and three times the 80th percentile of chlorophyll *a* concentrations at the reference site for moderate ecological protection areas.