NSW GOVERNMENT

DEPARTMENT OF PLANNING, INDUSTRY & ENVIRONMENT

State of the beaches 2019–2020

Sydney region

Beachwatch

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Front cover: Avalon Beach (Cameron Board/DPIE)

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ISBN 978-1-922431-61-5
EES 2020/0308
July 2020

Contents

Recreational water quality has been monitored in the Sydney region since 1989 by the Department of Planning, Industry and Environment's Beachwatch program. This report summarises the performance of 97 swimming sites in the Sydney region, providing a long-term assessment of how suitable a site is for swimming. Monitored sites include ocean beaches, a lagoon, a rockpool and estuarine sites in Pittwater, Sydney Harbour, Botany Bay, lower Georges River and Port Hacking.

In 2019–2020, 92% of swimming sites in the Sydney region were graded as Good or Very Good. These sites were suitable for swimming for most or almost all of the time. This is an excellent result and a slight improvement in performance on the previous year, reflecting relatively extended dry periods, and despite some isolated wet weather events. The Sydney region has a large proportion of lagoon and estuarine swimming locations, which have been most susceptible to impacts from significant rain events.

Sydney region summary 2019–2020

Beach monitoring in NSW

North Narrabeen Beach
Photo: Cameron Board/EES, DPIE

The water quality of beaches and other swimming locations is monitored under the NSW Government's Beachwatch programs to provide the community with accurate information on the cleanliness of the water and to enable individuals to make informed decisions about where and when to swim. Routine assessment also measures the impact of pollution sources, enables the effectiveness of stormwater and wastewater management practices to be assessed and highlights areas where further work is needed.

Swimming sites in New South Wales are graded as Very Good, Good, Fair, Poor or Very Poor in accordance with the National Health and Medical Research Council's 2008 *Guidelines for Managing Risks in Recreational Waters*. These Beach Suitability Grades provide a long-term assessment of how suitable a beach is for swimming. The grades are determined from the most recent 100 water quality results (two to four years' worth of data depending on the sampling frequency) and a risk assessment of potential pollution sources.

See the section on **Quality assurance** in the Statewide Summary for results of the quality assurance program.

Recreational water quality has been monitored in the Sydney region since 1989 by the Department of Planning, Industry and Environment's Beachwatch program.

A **quality assurance** program ensures the information collected and reported by Beachwatch is accurate and reliable.

Rainfall impacts

During 2019–2020, 97 swimming sites were monitored including ocean beaches, a lagoon, a rockpool and estuarine sites in Pittwater, Sydney Harbour, Botany Bay, lower Georges River and Port Hacking.

Rainfall is the major driver of pollution to recreational waters, generating stormwater runoff and triggering untreated discharges from the wastewater treatment and transport systems. Changes in rainfall patterns are reflected in beach water quality over time due to variation in the frequency and extent of stormwater and wastewater inputs.

The Beach Suitability Grades for 2019–2020 are based on water quality data collected over the last two to four years. Rainfall over this period has been diverse:

- 2016–2017: the wettest March on record for many coastal areas and intense storm activity over summer

- 2017–2018: prolonged dry weather periods broken by heavy rain at times
- 2018–2019: variable rainfall, with a mix of extended dry weather periods and some very wet months
- 2019–2020: average to below average rainfall, except for some isolated wet weather events and wet February.

See the section on **How to read this report** on page 139 for an explanation of the graphs, tables and Beach Suitability Grades.

Sydney's total rainfall in winter 2019 was slightly below the long-term average in the city and south, and slightly above the long-term average in the north. While moderate to heavy rain events occurred several times in June 2019 and late in August 2019, July 2019 was very dry, with most sites recording less than half of their long-term monthly totals.

The Sydney region received average to above average rainfall totals in September 2019, but with most of the rain falling over three days in the middle of the month. Avalon Beach recorded its highest September daily rainfall on record with 96 mm falling on the 18th.

Very dry conditions followed for the remainder of spring and early summer with well below average rainfall recorded from October 2019 to January 2020. December 2019 was significantly dry, with Sydney and Mona Vale recording their lowest December rainfall total on record with 2 mm and 1 mm respectively for the month, and Randwick recording its lowest December total rainfall since 1979, with 9 mm for the month.

Despite the dry December 2019 and January 2020, Sydney had its wettest summer since 1991–1992 due to very heavy rainfall in early February 2020. Monthly rainfall totals for February 2020 were more than three times the long-term monthly averages, with 442 mm at Sydney and 303 mm at Sans Souci. The severe wet weather led to flooding across Sydney as well as coastal erosion at some beaches.

Beachwatch issued extreme wet weather alerts on all Sydney daily beach pollution forecasts during February 2020, advising stormwater pollution may be impacting ocean beaches for an extended period, with lifeguard reports of floating debris and discoloured water continuing after the rain had ceased.

Sydney experienced many isolated showers during March 2020, with 21 days recording rainfall. April 2020 was dry with well below average rainfall totals recorded for the month.

Marine algal blooms

Water NSW reported several occurrences of marine algal blooms at Sydney beaches in 2019–2020. Algal blooms of the genus *Trichodesmium* were reported at Balmoral and Edwards beaches in Sydney Harbour in May 2019 and occurred in the harbours and at ocean beaches in February 2020. Marine algae advisories were issued on the Beachwatch and Water NSW websites.

Marine algal bloom present in the water

Photo: Chad Weston/NPWS, DPIE

The appearance of **marine algae** is sometimes mistaken for **sewage contamination** or **oil slicks**, due to a strong odour and red or brown discolouration in the water caused by the blooms.

As a precaution, direct contact with algae should be avoided as it can cause skin and eye irritations. The marine algal blooms dissipated with changes in tide and wind conditions.

Beachwatch issues daily **beach pollution forecasts** to enable beach goers to make informed decisions about where and when to swim.

Pollution forecasts for the Sydney region can be accessed via the Beachwatch website, email subscription, Twitter and Facebook.

Health risks

Contamination of recreational waters with faecal material from animal and human sources can pose significant health problems to beach users owing to the presence of pathogens (disease-causing micro-organisms) in the faecal material. The most common groups of pathogens found in recreational waters are bacteria, protozoans and viruses.

Exposure to contaminated water can cause gastroenteritis, with symptoms including vomiting, diarrhoea, stomach-ache, nausea, headache and fever. Eye, ear, skin and upper respiratory tract infections can also be contracted when pathogens come into contact with small breaks and tears in the skin or ruptures of the delicate membranes in the ear or nose.

Certain groups of users may be more vulnerable to microbial infection than others. Children, the elderly, people with compromised immune systems, tourists, and people from culturally and linguistically diverse backgrounds are generally most at risk.

Beach Suitability Grades for swimming sites in the Sydney region

Swimming site	Site type	Beach Suitability Grade	Change
Northern Sydney – Ocean beaches			
Palm Beach	Ocean beach	VG	●
Whale Beach	Ocean beach	VG	●
Avalon Beach	Ocean beach	VG	●
Bilgola Beach	Ocean beach	VG	●
Newport Beach	Ocean beach	VG	●
Bungan Beach	Ocean beach	VG	●
Mona Vale Beach	Ocean beach	G	↓
Warriewood Beach	Ocean beach	G	●
Turimetta Beach	Ocean beach	G	●
North Narrabeen Beach	Ocean beach	G	●
Narrabeen Lagoon (Birdwood Park)	Lagoon	G	●
Bilarong Reserve	Lagoon	G	↑
Collaroy Beach	Ocean beach	G	●
Long Reef Beach	Ocean beach	G	●
Dee Why Beach	Ocean beach	VG	●
North Curl Curl Beach	Ocean beach	G	●
South Curl Curl Beach	Ocean beach	VG	●
Freshwater Beach	Ocean beach	G	●
Queenscliff Beach	Ocean beach	G	●
North Steyne Beach	Ocean beach	G	●
South Steyne Beach	Ocean beach	G	●
Shelly Beach	Ocean beach	G	↓
Northern Sydney – Pittwater			
Barrenjoey Beach	Estuarine	G	●
Paradise Beach Baths	Estuarine	G	●

Swimming site	Site type	Beach Suitability Grade	Change
Northern Sydney – Pittwater (continued)			
Clareville Beach	Estuarine	G	●
Taylors Point Baths	Estuarine	G	●
Bayview Baths	Estuarine	G	●
Elvina Bay	Estuarine	VG	▲
North Scotland Island	Estuarine	G	●
South Scotland Island	Estuarine	G	●
The Basin	Estuarine	VG	●
Great Mackerel Beach	Estuarine	VG	●
Central Sydney – Ocean beaches			
Bondi Beach	Ocean beach	G	●
Tamarama Beach	Ocean beach	G	●
Bronte Beach	Ocean beach	G	●
Clovelly Beach	Ocean beach	VG	●
Gordons Bay	Ocean beach	G	●
Coogee Beach	Ocean beach	G	●
Maroubra Beach	Ocean beach	G	▼
South Maroubra Beach	Ocean beach	G	●
South Maroubra Rockpool	Ocean baths	G	●
Malabar Beach	Ocean beach	P	●
Little Bay Beach	Ocean beach	G	●
Central Sydney – Sydney Harbour			
Camp Cove	Estuarine	VG	●
Watsons Bay	Estuarine	G	●
Parsley Bay	Estuarine	G	●
Nielsen Park	Estuarine	VG	●
Rose Bay Beach	Estuarine	P	●

Swimming site	Site type	Beach Suitability Grade	Change
Central Sydney – Sydney Harbour (continued)			
Murray Rose Pool	Estuarine	G	●
Dawn Fraser Pool	Estuarine	G	●
Chiswick Baths	Estuarine	G	●
Cabarita Beach	Estuarine	G	●
Woolwich Baths	Estuarine	G	●
Tambourine Bay	Estuarine	G	●
Woodford Bay	Estuarine	G	●
Greenwich Baths	Estuarine	G	●
Hayes St Beach	Estuarine	P	↓
Clifton Gardens	Estuarine	G	●
Balmoral Baths	Estuarine	G	●
Edwards Beach	Estuarine	G	●
Chinamans Beach	Estuarine	G	●
Northbridge Baths	Estuarine	F	●
Davidson Reserve	Estuarine	P	●
Gurney Crescent Baths	Estuarine	F	●
Clontarf Pool	Estuarine	G	●
Forty Baskets Pool	Estuarine	G	●
Fairlight Beach	Estuarine	G	●
Manly Cove	Estuarine	G	●
Little Manly Cove	Estuarine	G	●
Southern Sydney – Ocean beaches			
Boat Harbour	Ocean beach	G	●
Greenhills Beach	Ocean beach	VG	●
Wanda Beach	Ocean beach	VG	●
Elouera Beach	Ocean beach	VG	●

Swimming site	Site type	Beach Suitability Grade	Change
Southern Sydney – Ocean beaches (continued)			
North Cronulla Beach	Ocean beach	VG	●
South Cronulla Beach	Ocean beach	VG	●
Shelly Beach	Ocean beach	VG	●
Oak Park	Ocean beach	VG	●
Southern Sydney – Botany Bay and lower Georges River			
Silver Beach	Estuarine	G	●
Como Baths	Estuarine	G	●
Jew Fish Bay Baths	Estuarine	G	●
Oatley Bay Baths	Estuarine	G	▲
Carss Point Baths	Estuarine	G	▲
Sandringham Baths	Estuarine	G	●
Dolls Point Baths	Estuarine	G	●
Ramsgate Baths	Estuarine	G	●
Monterey Baths	Estuarine	G	●
Brighton-Le-Sands Baths	Estuarine	G	●
Kyeemagh Baths	Estuarine	G	●
Foreshores Beach	Estuarine	P	▲
Yarra Bay	Estuarine	G	●
Frenchmans Bay	Estuarine	G	●
Congwong Bay	Estuarine	G	●
Southern Sydney – Port Hacking			
Jibbon Beach	Estuarine	VG	●
Horderns Beach	Estuarine	G	●
Gymea Bay Baths	Estuarine	F	●

Swimming site	Site type	Beach Suitability Grade	Change
Southern Sydney – Port Hacking (continued)			
Lilli Pilli Baths	Estuarine	G	●
Gunnamatta Bay Baths	Estuarine	G	●

Beach Suitability Grade					Change		
VG	G	F	P	VP	↑	●	↓
Very Good	Good	Fair	Poor	Very Poor	Improved	Stable	Declined

Northern Sydney (Pittwater to Manly)

Overall results

100%

swimming sites graded Good or Very Good

All 32 swimming sites were graded as Very Good or Good in 2019–2020. This is an excellent result and a slight improvement in performance on the previous year.

Percentage of sites graded as Very Good or Good:

- 2019–2020: 100%
- 2018–2019: 97%
- 2017–2018: 100%
- 2016–2017: 91%.

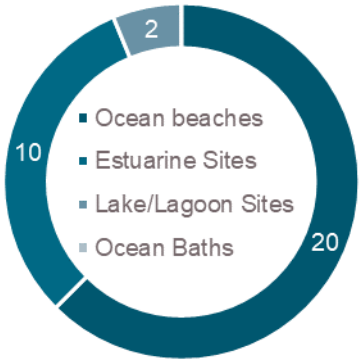
See the section on **How to read this report** on page 139 for an explanation of the graphs, tables and Beach Suitability Grades.

Beachwatch samples the ocean beaches and Narrabeen Lagoon every sixth day throughout the year, and estuarine beaches every sixth day between October and April, and monthly from May to September.

Best beaches

Palm Beach, Whale Beach, Avalon Beach, Bilgola Beach, Newport Beach, Bungan Beach, Dee Why Beach, South Curl Curl Beach, Elvina Bay, The Basin and Great Mackerel Beach.

These sites had excellent water quality and were suitable for swimming almost all of the time.



Site types in Northern Sydney region

Swimming sites monitored in the Northern Sydney region include ocean beaches, estuarine areas in Pittwater and lagoon sites in Narrabeen Lagoon, with each site type having a different response to rainfall-related impacts.

Estuarine and lagoon swimming sites did not perform as well as ocean beaches due to lower levels of flushing, which increase the time needed to disperse and dilute pollution inputs, taking longer to recover from stormwater events.

As a general precaution swimming should be avoided during and for at least one day after heavy rain at ocean beaches, and for up to three days in estuarine and lagoon areas, or if there are signs of stormwater pollution such as discoloured water or floating debris.

Swimming is not recommended at ocean beaches located near lagoon entrances if the lagoon is open, due to the possibility of pollution from the outflow.

Ocean beaches

Beach Suitability Grades for Northern Sydney ocean beaches

All 20 ocean beaches were graded as Very Good or Good in 2019–2020.

Palm, Whale, Avalon, Bilgola, Newport, Bungan, Dee Why and South Curl Curl beaches were graded as Very Good. The water quality at these sites was of a very high standard and suitable for swimming almost all of the time.

Mona Vale, Warriewood, Turimetta, North Narrabeen, Collaroy, Long Reef, North Curl Curl, Freshwater, Queenscliff, North Steyne, South Steyne and Shelly beaches were graded as Good. Mona Vale and Shelly beaches were downgraded to Good from Very Good in 2018–2019.

Water quality was suitable for swimming during dry weather conditions, but swimming should be avoided during and for up to one day following heavy rainfall.

Estuarine beaches

Beach Suitability Grades for Northern Sydney estuarine beaches

All 10 estuarine swimming sites in Pittwater were graded as Very Good or Good in 2019–2020.

Elvina Bay, The Basin and Great Mackerel Beach were graded as Very Good. These sites had excellent water quality and were suitable for swimming almost all of the time.

Elvina Bay was upgraded to Very Good from Good in the previous year, due to improved microbial water quality, reflecting a higher number of samples collected in dry weather conditions compared to the previous year.

Barrenjoey Beach, Paradise Beach Baths, Clareville Beach, Taylors Point Baths, Bayview Baths, North Scotland Island and South Scotland Island were graded as Good, a similar result to the previous year. Water quality at these sites was suitable for swimming most of the time, with elevated levels of enterococci mostly recorded following rainfall.

While Bayview Baths and Barrenjoey Beach have been graded Good for the last three years, elevated enterococci levels were occasionally recorded during dry weather conditions. Water quality at these sites can take longer to recover from stormwater events than at other Pittwater swimming sites due to lower levels of flushing.

Lake/lagoon swimming sites

Beach Suitability Grades for Northern Sydney lake/lagoon swimming sites

The two sites in Narrabeen Lagoon, Birdwood Park and Bilarong Reserve, were graded Good. Bilarong Reserve improved to Good from a Poor grade in 2018–2019. Water quality at these sites was mostly suitable for swimming during dry weather, with elevated enterococci levels recorded following rainfall.

Birdwood Park in Narrabeen Lagoon has been graded as Good for the last three years. While microbial water quality was occasionally elevated during dry weather, it was generally of good standard with 86% of samples suitable for swimming when there had be no rain in the previous 24 hours. Enterococci levels increased with increasing rainfall, and often exceeded the safe swimming limit after light rainfall. Birdwood Park is located at the entrance to the lagoon and water quality at this site is influenced by wet weather events and whether the lagoon is open to the ocean. Discharge from Narrabeen Lagoon is a significant source of faecal contamination.

Bilarong Reserve in Narrabeen Lagoon improved to Good from a Poor grade in 2018–2019. The microbial water quality at this site improved slightly from the previous year and remains close to the threshold between Good and Poor, with the site fluctuating several times between the grades over the past several years. During dry weather, enterococci levels occasionally exceeded the safe swimming limit, and were regularly unsuitable for swimming after light to moderate rainfall. The swimming site retains pollution inputs because it is located away from the lagoon entrance and is not well flushed by clean ocean water. A significant source of faecal contamination is stormwater runoff to the lagoon.

Water quality at Birdwood Park and Bilarong Reserve lagoon sites has improved slightly from the previous year. During the assessment period, Narrabeen Lagoon has closed naturally for extended periods and been mechanically opened by council on several occasions. While the entrance to the lagoon remains closed, water quality is likely to decline as pollution inputs are not as readily dissipated or flushed. Between September and December 2018, council undertook large scale clearance works which kept the lagoon entrance open until October 2019 before it closed naturally. The lagoon entrance remained closed until it was mechanically opened during a storm in February 2020, and has remained open since. This will allow the lagoon to be well flushed by clean ocean water.

Management

Patrolled ocean beach
Photo: Beachwatch/EES, DPIE

A **Coastal Management Program** (CMP) outlines a long-term strategy for managing the coast, in line with the *Coastal Management Act 2016*.

The NSW Government provides guidance and funding through the Coastal and Estuary Grants Program for local councils to prepare and implement CMPs.

Under the previous *Coastal Protection Act 1979*, councils developed a **Coastal Zone Management Plan** (CZMP) to address coastal issues. Councils can continue to implement priority actions from certified CZMPs with funding assistance from the NSW Government's Coastal and Estuary Grants Program until 2021.

With funding from the NSW Government's Coastal and Estuary Grants Program, a group of councils (including Northern Beaches, Hawkesbury, Ku-ring-gai, The Hills, Central Coast and Hornsby) have completed the Hawkesbury-Nepean River System Coastal Management Program (CMP) Stage 1 Scoping Study. The development of a CMP will allow councils to identify catchment pressures in the system (including Pittwater, Broken Bay and Brisbane Water), to prioritise management initiatives to manage issues relating to coastal and estuary health. Water quality management actions such as stormwater infrastructure improvements, restoring and maintaining riparian areas and strategic land-use planning will be considered during the process.

Under the NSW Government's Coastal and Estuary Grants Program, funding has been given to Northern Beaches Council to prepare the first stage of the Northern Beaches Coastal Management Program (CMP), the scoping study. The development of a CMP will allow the council to identify coastal hazards (which could include some water quality management actions) and prioritise initiatives to manage these.

The NSW National Parks and Wildlife Service has decommissioned septic systems and installed a number of sewer pumping stations to service Barrenjoey Head, located at the northern end of Barrenjoey Beach. The lighthouse and Fisherman's Cottages were decommissioned in July 2016, and Boatman's Cottage in November 2016. Final connection of the Barrenjoey Head sewer system to the Sydney Water sewerage network was completed in December 2019.

Northern Beaches Council

Northern Beaches Council proactively inspects and cleans out 242 stormwater quality improvement devices. Work is continuing to standardise measurement of gross pollutants and debris and improve data management across the amalgamated council. During 2018–2019, a new gross pollutant trap was constructed, six end-of-pipe trash nets were replaced, and other minor renewal works were completed in the local government area.

Two major sediment removal projects took place in 2018–2019, removing thousands of tonnes of sediment from Burnt Bridge Creek, which feeds into Manly Lagoon and Queenscliff Beach, and at South Creek, which leads to Narrabeen Lagoon. Removal of excess sediment is important, as high sediment loads can cloud waterways, affecting vegetation and fish health. Sediment can also carry

pollutants such as faecal bacteria, toxins and nutrients that encourage algal growth.

Queenscliff Beach
Photo: Cameron Board/EES, DPIE

During 2019 and 2020, Sydney Water, Northern Beaches Council and Beachwatch officers collected samples at Manly and Narrabeen lagoon entrances for genetic analysis. It is anticipated the genetic analysis, to be undertaken by the University of Newcastle in 2020–2021, will shed light on possible contributors to faecal contamination at these popular sites.

Northern Beaches Council and Sydney Water collaborated in 2016–2017 to assess dry and wet weather stormwater quality around Bayview Baths, Bayview. The area was found to be impacted by diffuse stormwater pollution, and therefore swimming at Bayview Baths should be avoided for at least three days after heavy rain.

Water sensitive urban design has been implemented across the local government area and particularly in the Warriewood land release area, where it improves water quality prior to discharge into Narrabeen Lagoon.

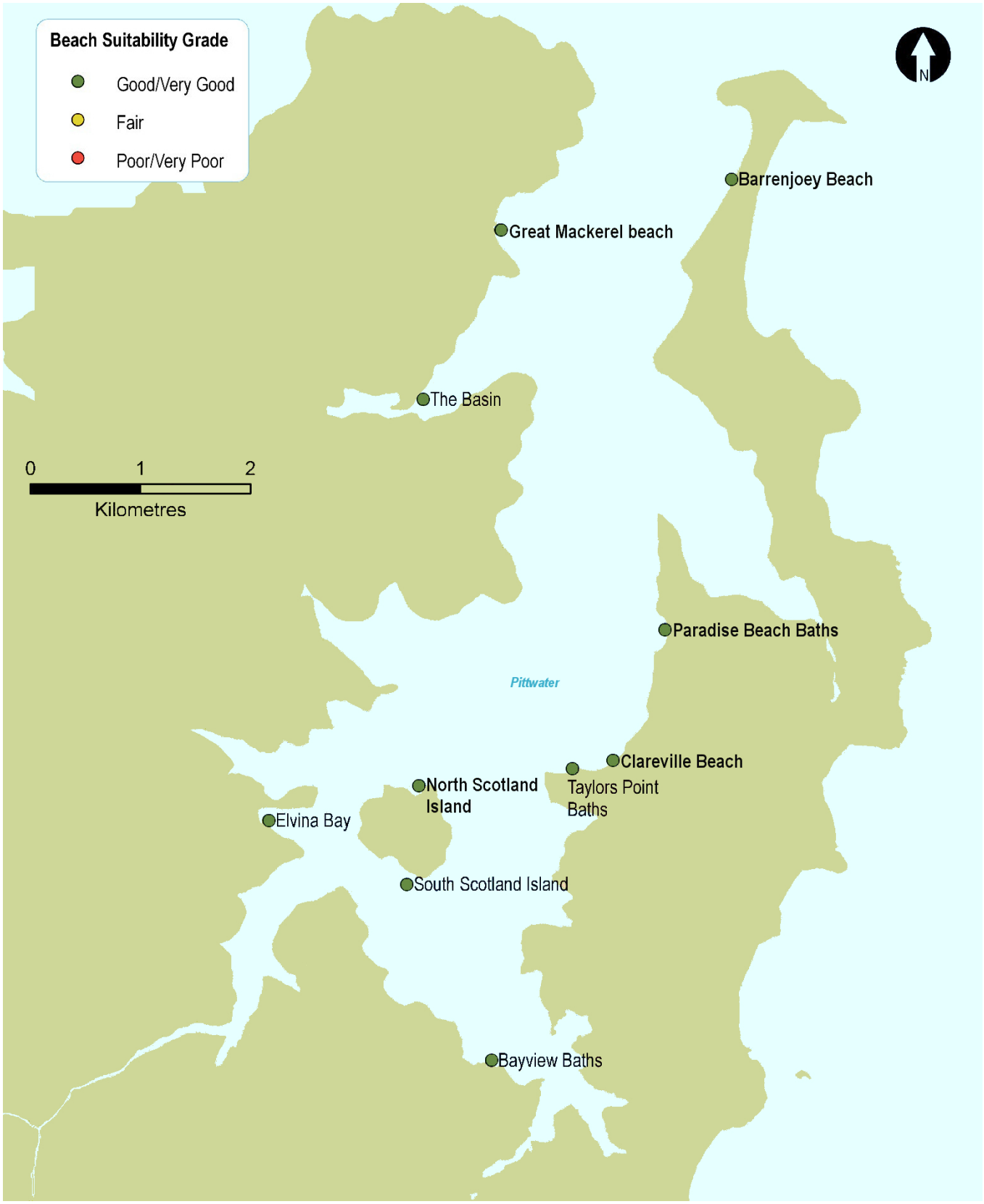
In late 2018, Northern Beaches Council cleared the entrance of Narrabeen Lagoon to reduce flood risk, using the sand to replenish sand lost from Collaroy–Narrabeen Beach. This lagoon entrance is usually cleared about every four years or when required to prevent flooding to nearby properties.

North Scotland Island
Photo: Cameron Board/EES, DPIE

Sydney Water

Sydney Water has inspected, cleaned and repaired sewer mains that have a high likelihood of discharging sewage to waterways if they become blocked. When significant tree root intrusion to the public sewer from the private sewer was identified, property owners were requested to remedy the problem.

Sampling sites and Beach Suitability Grades at Sydney's Northern Beaches



Sampling sites and Beach Suitability Grades in Pittwater

Palm Beach

Beach grade: VG

See ‘How to read this report’ for key to map.

Palm Beach is 2.3 kilometres long, with rock baths in the southern corner. Lifeguards patrol the beach from September to April.

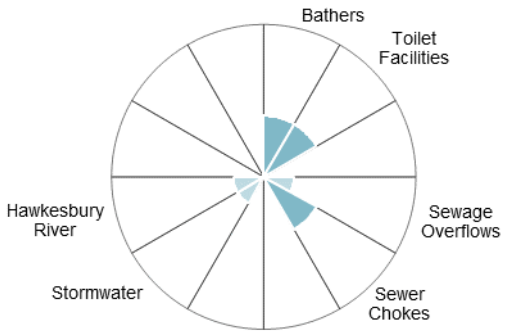
The Beach Suitability Grade of Very Good indicates microbial water quality is considered suitable for swimming almost all of the time, with few potential sources of faecal contamination.

Enterococci levels increased slightly with increasing rainfall, occasionally exceeding the safe swimming limit after 5 mm or more of rainfall.

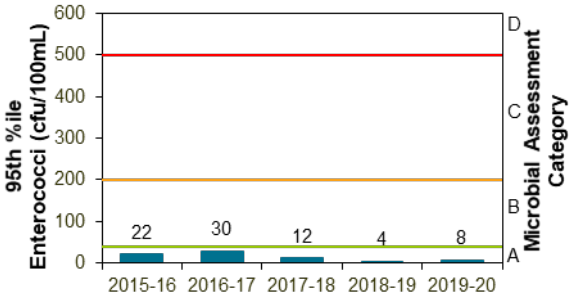
The site has been monitored since 1989.

Site type	Assessment period	Dry weather samples suitable for swimming	Water samples	Beach grade status
Ocean beach	Jul 2018 to Apr 2020	97%	100	Stable

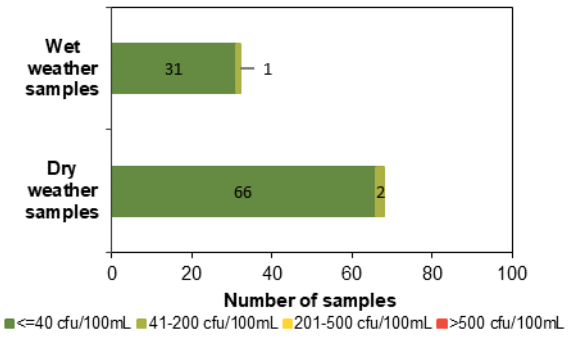
Sanitary inspection: Low



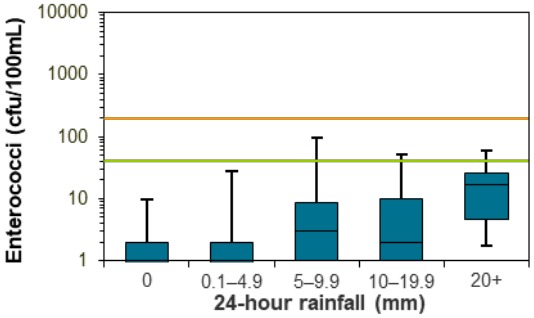
Microbial Assessment Category: A



Dry and wet weather water quality



Water quality in response to rainfall



Whale Beach

Beach grade: VG

See ‘How to read this report’ for key to map.

Whale Beach is 600 metres long, with rock baths at the southern rock platform. Lifeguards patrol the beach from September to April.

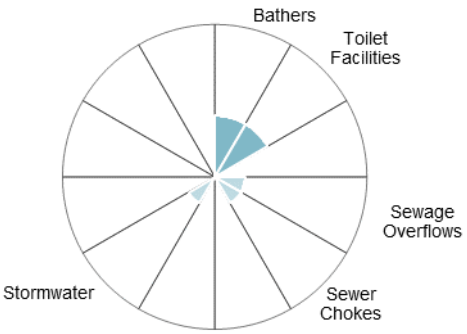
The Beach Suitability Grade of Very Good indicates microbial water quality is considered suitable for swimming almost all of the time, with few potential sources of faecal contamination.

Enterococci levels increased slightly with increasing rainfall, but usually remained below the safe swimming limit across all rainfall categories.

The site has been monitored since 1989.

Site type	Assessment period	Dry weather samples suitable for swimming	Water samples	Beach grade status
Ocean beach	Jul 2018 to Apr 2020	97%	100	Stable

Sanitary inspection: Low



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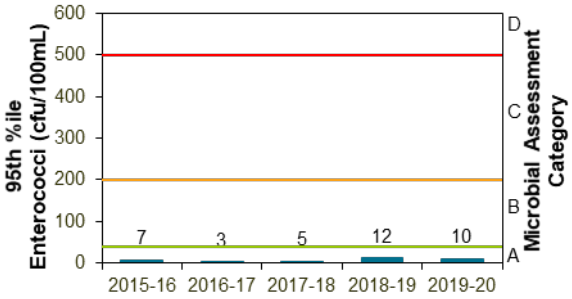
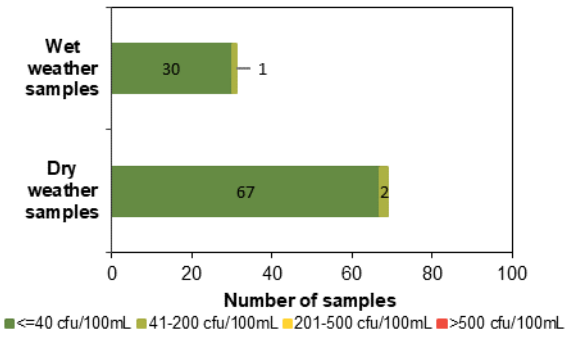
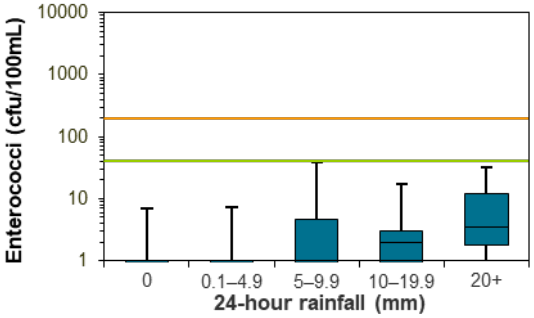


Dry and wet weather water quality



Water quality in response to rainfall



Avalon Beach

Beach grade: VG

See ‘How to read this report’ for key to map.

Avalon Beach is 500 metres long and backed by a park and picnic area. Lifeguards patrol the beach from September to April.

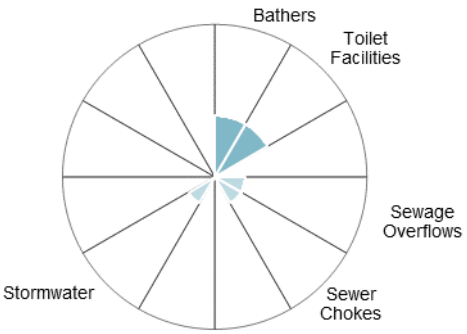
The Beach Suitability Grade of Very Good indicates microbial water quality is considered suitable for swimming almost all of the time, with few potential sources of faecal contamination.

Enterococci levels increased slightly with increasing rainfall, occasionally exceeding the safe swimming limit in response to 10 mm or more of rainfall.

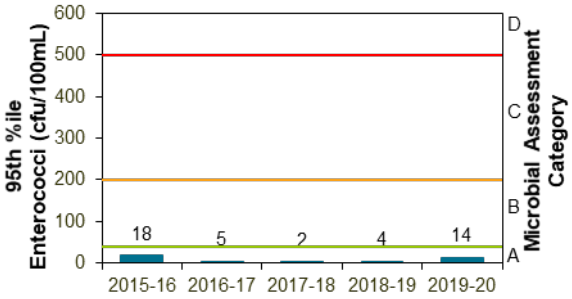
The site has been monitored since 1989.

Site type	Assessment period	Dry weather samples suitable for swimming	Water samples	Beach grade status
Ocean beach	Jul 2018 to Apr 2020	97%	100	Stable

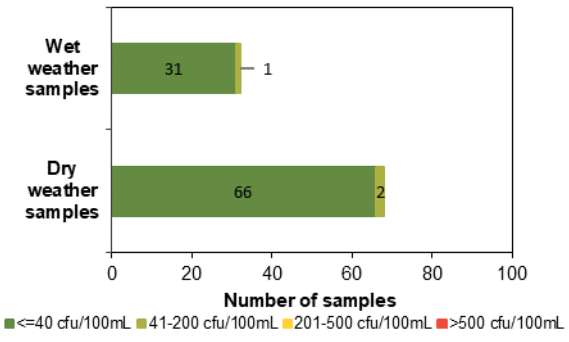
Sanitary inspection: Low



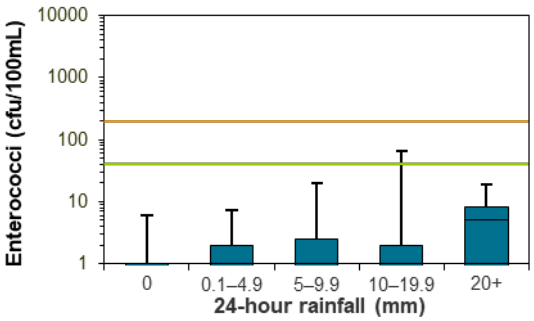
Microbial Assessment Category: A



Dry and wet weather water quality



Water quality in response to rainfall



Bilgola Beach

Beach grade: VG

See ‘How to read this report’ for key to map.

Bilgola Beach is 500 metres long, with rock baths at the southern end. Lifeguards patrol the beach from September to April.

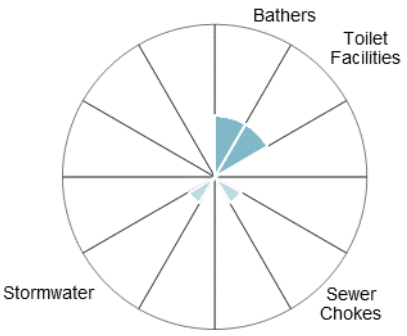
The Beach Suitability Grade of Very Good indicates microbial water quality is considered suitable for swimming almost all of the time, with few potential sources of faecal contamination.

Enterococci levels generally increased with increasing rainfall, occasionally exceeding the safe swimming limit after 5 mm or more of rain, and regularly after 20 mm or more.

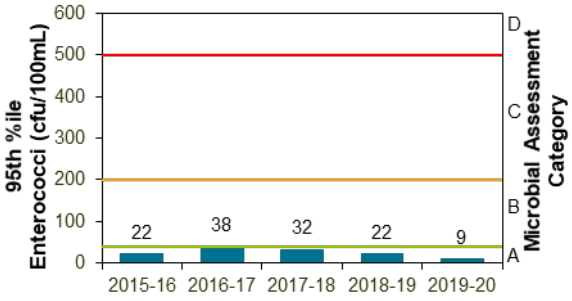
The site has been monitored since 1989.

Site type	Assessment period	Dry weather samples suitable for swimming	Water samples	Beach grade status
Ocean beach	Jul 2018 to Apr 2020	100%	100	Stable

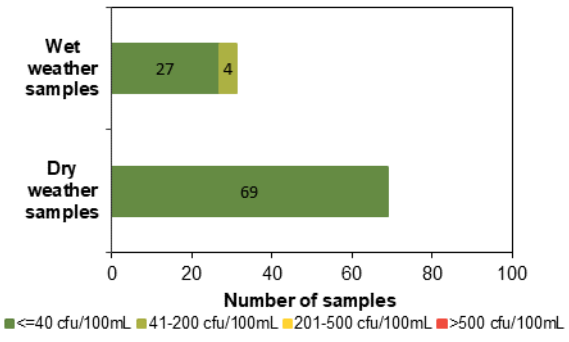
Sanitary inspection: Low



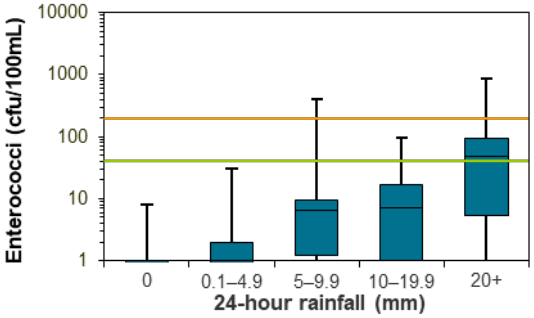
Microbial Assessment Category: A



Dry and wet weather water quality

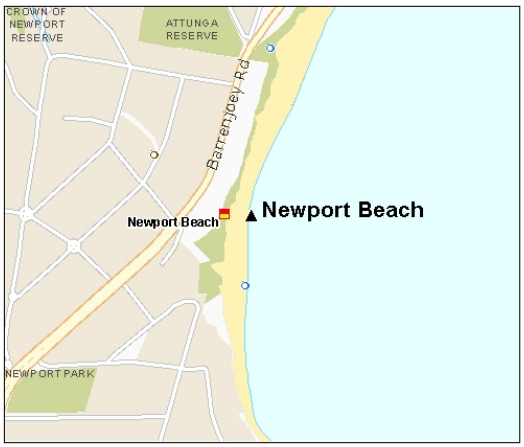


Water quality in response to rainfall



Newport Beach

Beach grade: VG



See 'How to read this report' for key to map.

Newport Beach is an open, east facing beach around 1.3 kilometres long. Lifeguards patrol the beach from September to April.

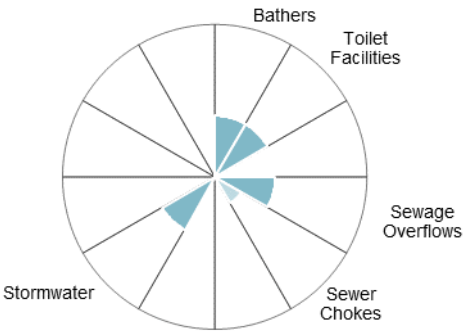
The Beach Suitability Grade of Very Good indicates microbial water quality is considered suitable for swimming almost all of the time, with few potential sources of significant faecal contamination.

Enterococci levels generally increased with increasing rainfall, occasionally exceeding the safe swimming limit after light rain, and often after 20 mm or more.

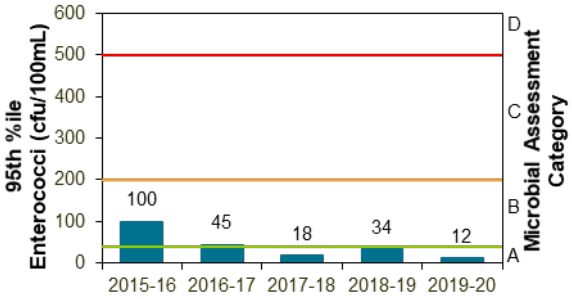
The site has been monitored since 1989.

Site type	Assessment period	Dry weather samples suitable for swimming	Water samples	Beach grade status
Ocean beach	Jul 2018 to Apr 2020	97%	100	Stable

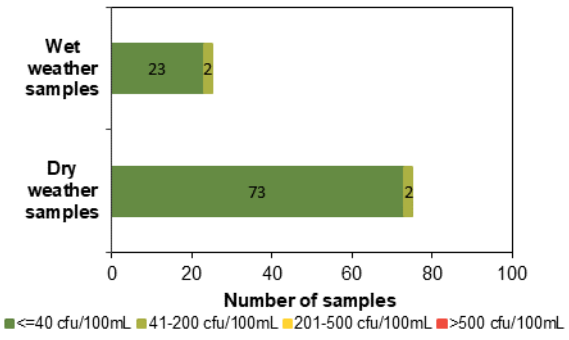
Sanitary inspection: Low



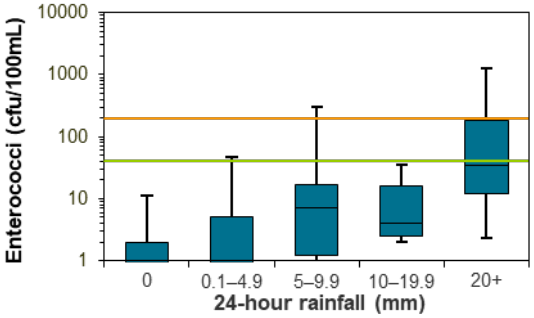
Microbial Assessment Category: A



Dry and wet weather water quality



Water quality in response to rainfall



Bungan Beach

Beach grade: VG

See ‘How to read this report’ for key to map.

Bungan Beach is 600 metres long and backed by a steep escarpment. Lifeguards patrol the beach from late December to the end of January.

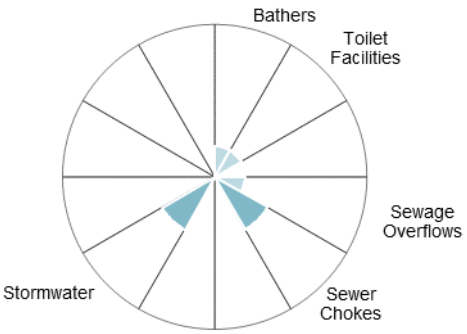
The Beach Suitability Grade of Very Good indicates microbial water quality is considered suitable for swimming almost all of the time, with few potential sources of significant faecal contamination.

Enterococci levels increased slightly with increasing rainfall, often exceeding the safe swimming limit in response to 20 mm or more of rainfall.

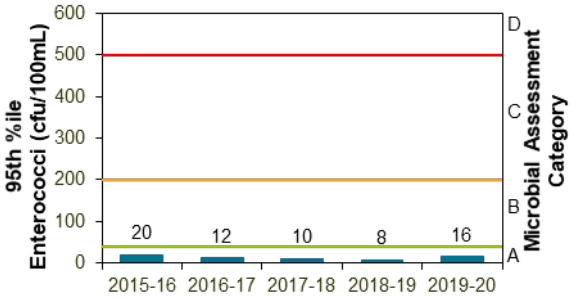
The site has been monitored since 1989.

Site type	Assessment period	Dry weather samples suitable for swimming	Water samples	Beach grade status
Ocean beach	Jul 2018 to Apr 2020	97%	100	Stable

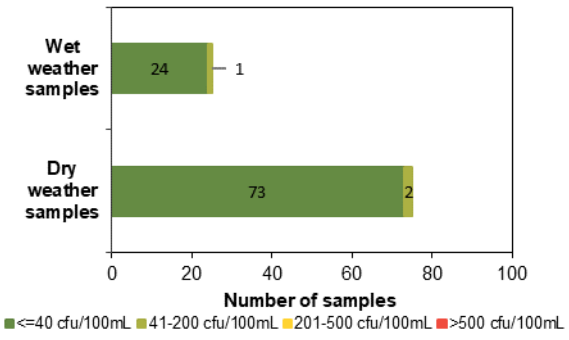
Sanitary inspection: Low



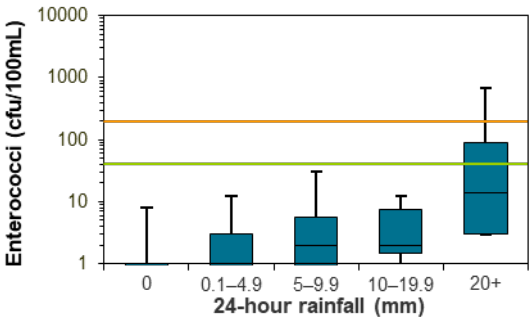
Microbial Assessment Category: A



Dry and wet weather water quality



Water quality in response to rainfall



Mona Vale Beach

Beach grade: G

See ‘How to read this report’ for key to map.

Mona Vale Beach is one kilometre long. Lifeguards patrol the beach from September to April.

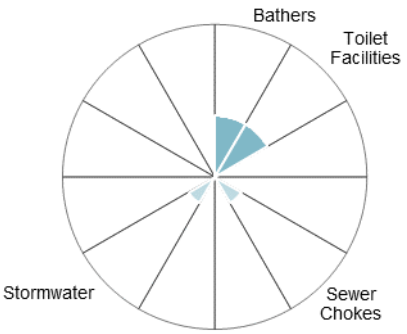
The Beach Suitability Grade of Good indicates microbial water quality is considered suitable for swimming most of the time but can be susceptible to pollution after rain, with several potential sources of minor faecal contamination.

Enterococci levels generally increased with increasing rainfall, occasionally exceeding the safe swimming limit after light rain, and often after 20 mm or more.

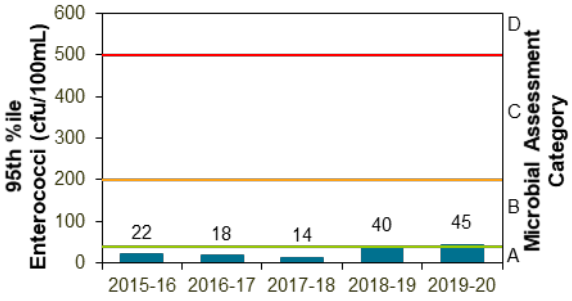
The site has been monitored since 1989.

Site type	Assessment period	Dry weather samples suitable for swimming	Water samples	Beach grade status
Ocean beach	Jul 2018 to Apr 2020	99%	100	Declined

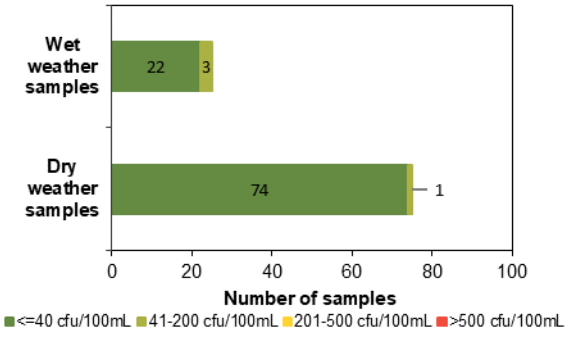
Sanitary inspection: Low



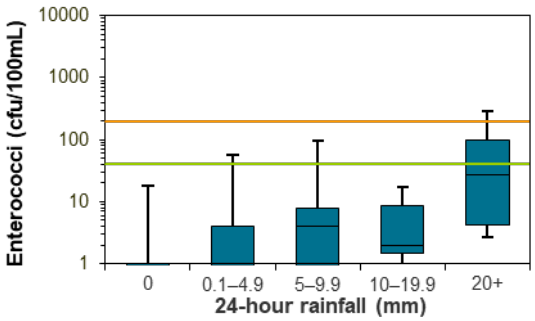
Microbial Assessment Category: B



Dry and wet weather water quality



Water quality in response to rainfall



Warriewood Beach

Beach grade: G

See 'How to read this report' for key to map.

Warriewood Beach is 500 metres long and located below a steep bluff. The beach is patrolled during holiday periods.

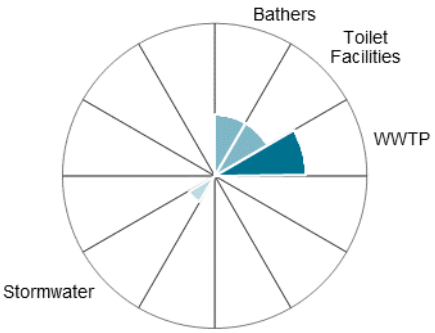
The Beach Suitability Grade of Good indicates microbial water quality is considered suitable for swimming most of the time but can be susceptible to pollution after rain, with several potential sources of faecal contamination including Warriewood Wastewater Treatment Plant (WWTP).

Enterococci levels generally increased with increasing rainfall, often exceeding the safe swimming limit after 20 mm or more of rainfall.

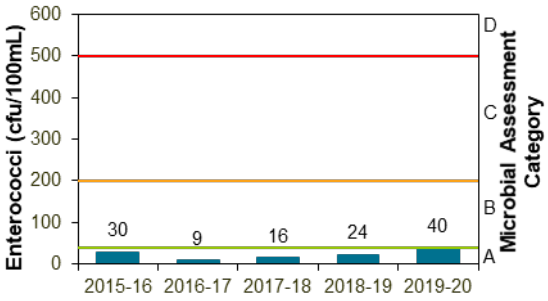
The site has been monitored since 1989.

Site type	Assessment period	Dry weather samples suitable for swimming	Water samples	Beach grade status
Ocean beach	Jul 2018 to Apr 2020	96%	100	Stable

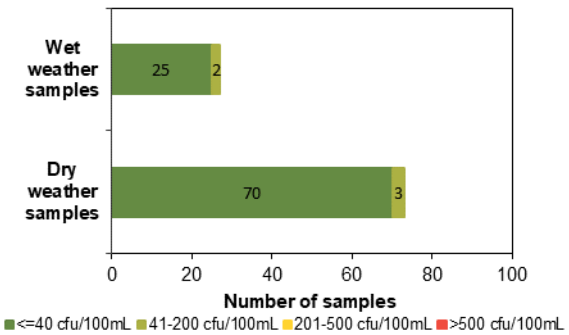
Sanitary inspection: Moderate



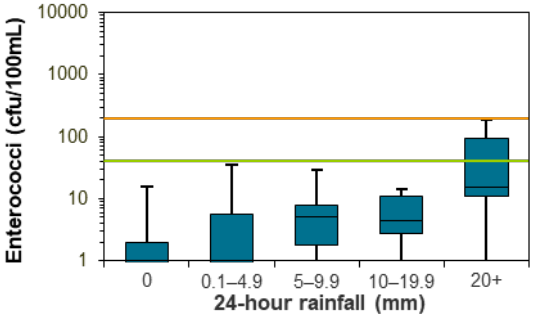
Microbial Assessment Category: A



Dry and wet weather water quality

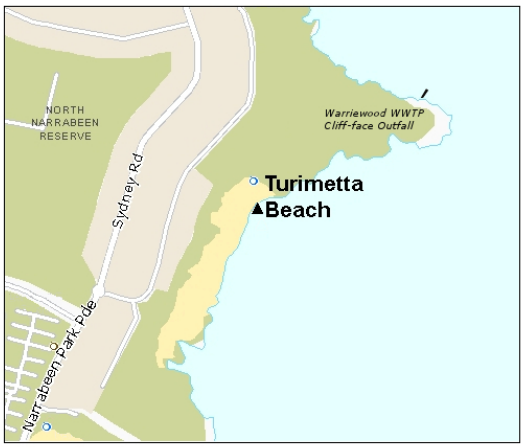


Water quality in response to rainfall



Turimetta Beach

Beach grade: G



See 'How to read this report' for key to map.

Turimetta Beach is 350 metres long and is backed by steep bluffs. This beach is not patrolled by lifeguards.

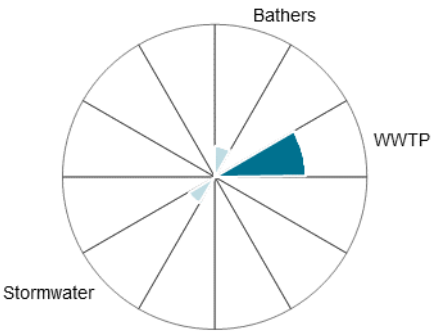
The Beach Suitability Grade of Good indicates microbial water quality is considered suitable for swimming most of the time but may be susceptible to pollution after rain, with several potential sources of faecal contamination including Warriewood WWTP.

Enterococci levels increased slightly with increasing rainfall, occasionally exceeding the safe swimming limit after rainfall.

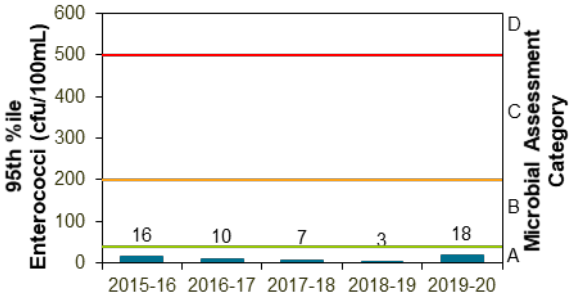
The site has been monitored since 1994.

Site type	Assessment period	Dry weather samples suitable for swimming	Water samples	Beach grade status
Ocean beach	Jul 2018 to Apr 2020	99%	100	Stable

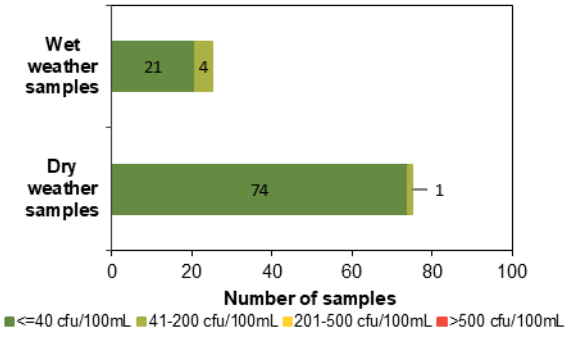
Sanitary inspection: Moderate



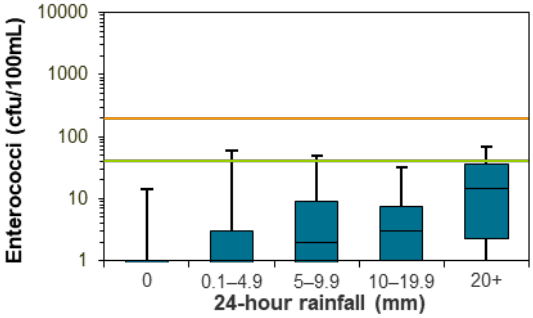
Microbial Assessment Category: A



Dry and wet weather water quality



Water quality in response to rainfall



North Narrabeen Beach

Beach grade: G

See 'How to read this report' for key to map.

North Narrabeen Beach is located at the northern end of the 3.5 kilometre-long beach and is patrolled from September to April.

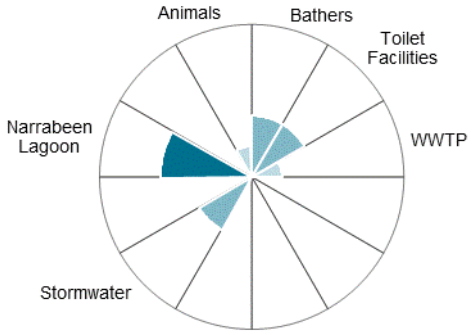
The Beach Suitability Grade of Good indicates microbial water quality is considered suitable for swimming most of the time but may be susceptible to pollution after rain, with several potential sources of faecal contamination including discharge from Narrabeen Lagoon.

Enterococci levels increased with increasing rainfall, occasionally exceeding the safe swimming limit in response to light rain, and often after 10 mm or more.

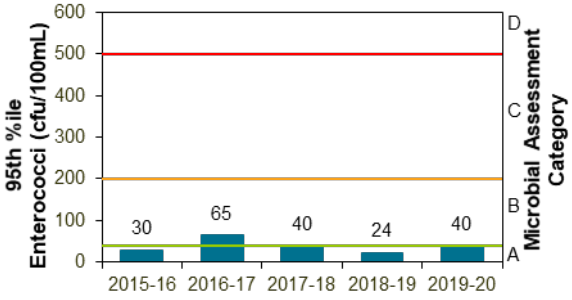
The site has been monitored since 1989.

Site type	Assessment period	Dry weather samples suitable for swimming	Water samples	Beach grade status
Ocean beach	Jul 2018 to Apr 2020	96%	100	Stable

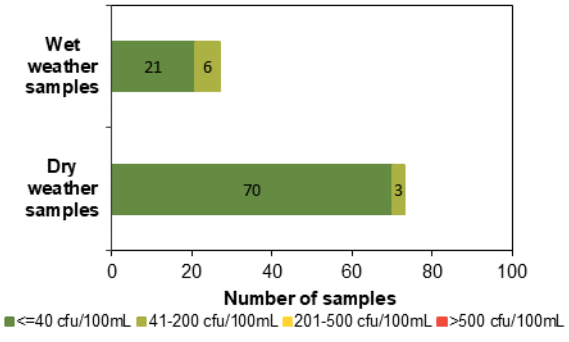
Sanitary inspection: Moderate



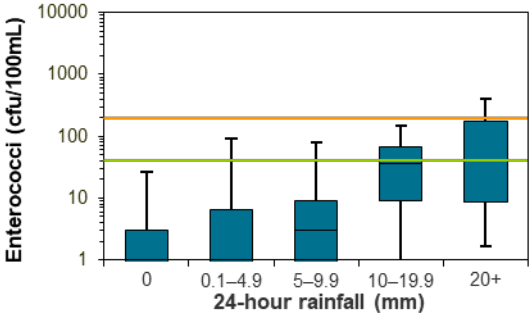
Microbial Assessment Category: A



Dry and wet weather water quality



Water quality in response to rainfall



Narrabeen Lagoon (Birdwood Park)

Beach grade: G

See 'How to read this report' for key to map.

The Birdwood Park swimming site is a sandy beach on the southern side of the entrance to Narrabeen Lagoon. The lagoon entrance has been periodically open and closed at times.

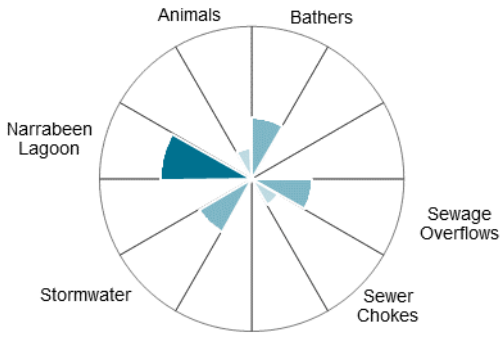
The Beach Suitability Grade of Good indicates microbial water quality is considered suitable for swimming most of the time but can be susceptible to pollution after rain, with several potential sources of faecal contamination including the lagoon itself.

Enterococci levels increased with increasing rainfall, occasionally exceeding the safe swimming limit after no rain, and often after rainfall.

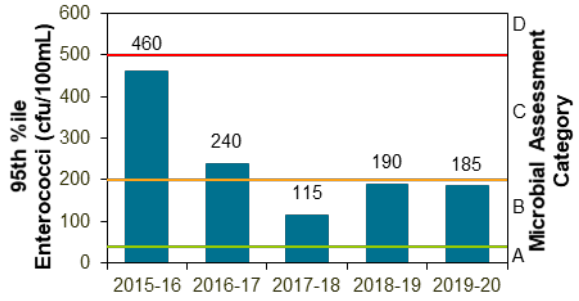
The site has been monitored since 2004.

Site type	Assessment period	Dry weather samples suitable for swimming	Water samples	Beach grade status
Lagoon	Jul 2018 to Apr 2020	86%	100	Stable

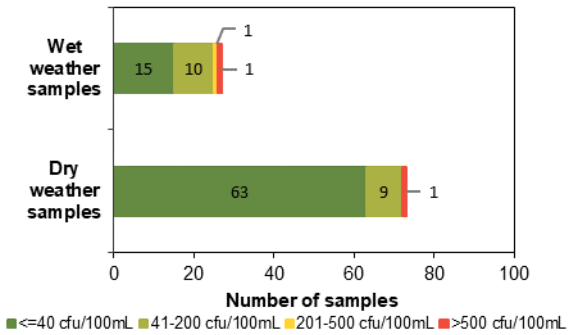
Sanitary inspection: Moderate



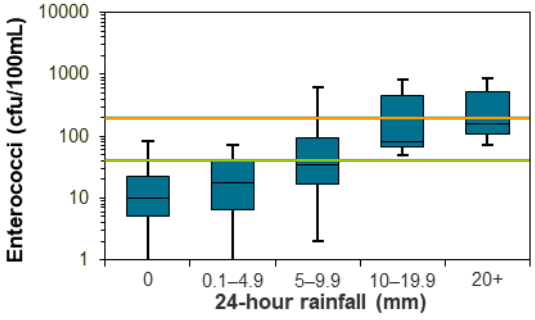
Microbial Assessment Category: B



Dry and wet weather water quality



Water quality in response to rainfall



Bilarong Reserve

Beach grade: G

See ‘How to read this report’ for key to map.

Bilarong Reserve is located on the northern shoreline of Narrabeen Lagoon.

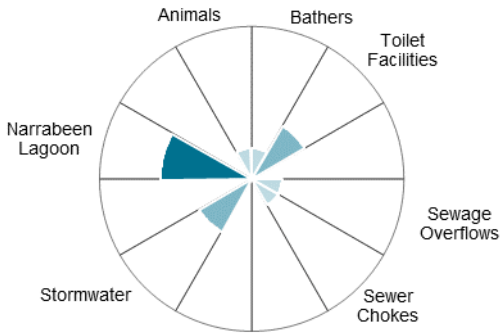
The Beach Suitability Grade of Good indicates microbial water quality is considered suitable for swimming most of the time but can be susceptible to pollution after rain, with several potential sources of faecal contamination including the lagoon itself.

Enterococci levels generally increased with increasing rainfall, occasionally exceeding the safe swimming limit in response to little or no rain, and regularly after 5 mm or more.

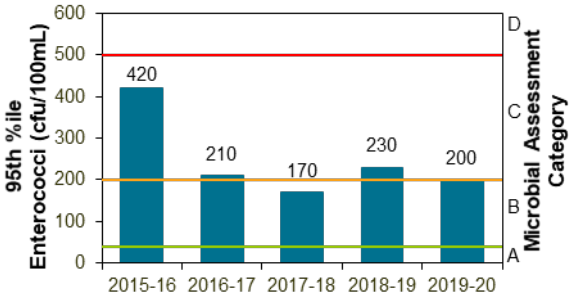
The site has been monitored since 2014.

Site type	Assessment period	Dry weather samples suitable for swimming	Water samples	Beach grade status
Lagoon	Jul 2018 to Apr 2020	82%	100	Improved ↑

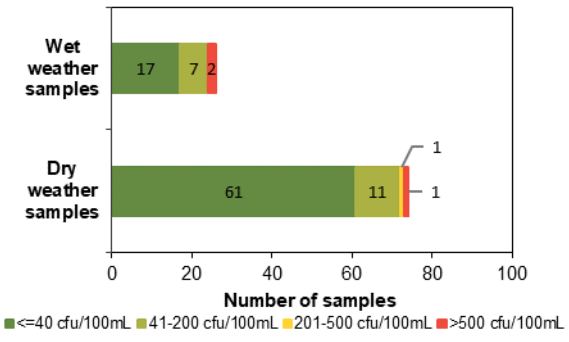
Sanitary inspection: Moderate



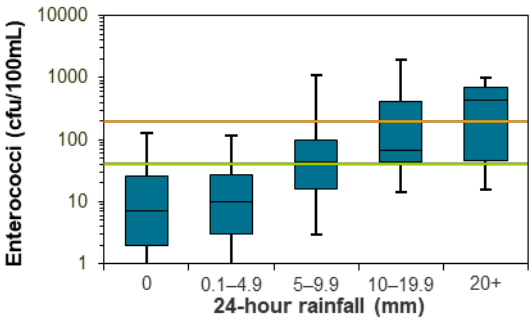
Microbial Assessment Category: B



Dry and wet weather water quality

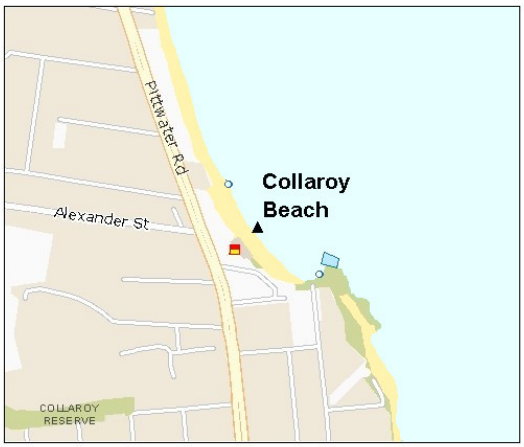


Water quality in response to rainfall



Collaroy Beach

Beach grade: G



See ‘How to read this report’ for key to map.

Collaroy Beach is backed by a park and picnic area. Lifeguards patrol the beach from September to April.

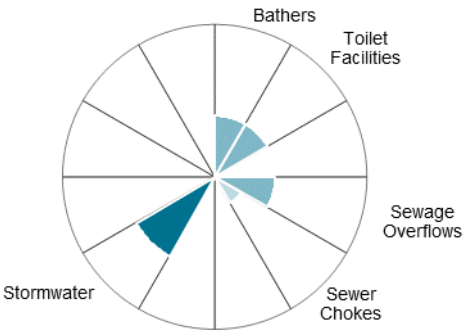
The Beach Suitability Grade of Good indicates microbial water quality is considered suitable for swimming most of the time but may be susceptible to pollution after rain, with several potential sources of faecal contamination including stormwater.

Enterococci levels increased with increasing rainfall, occasionally exceeding the safe swimming limit after light rain and often after 5 mm or more.

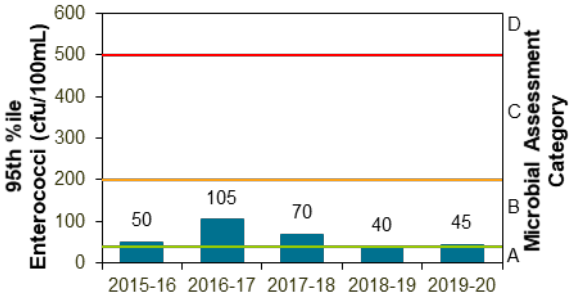
The site has been monitored since 1989.

Site type	Assessment period	Dry weather samples suitable for swimming	Water samples	Beach grade status
Ocean beach	Jul 2018 to Apr 2020	99%	100	Stable

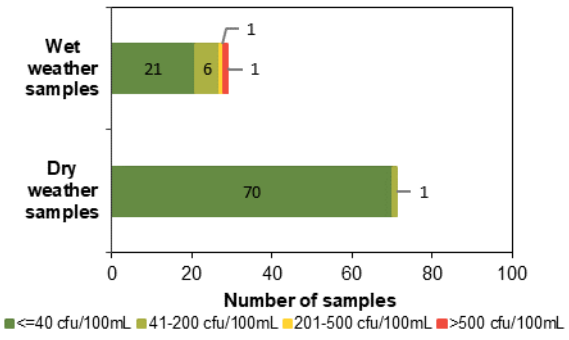
Sanitary inspection: Moderate



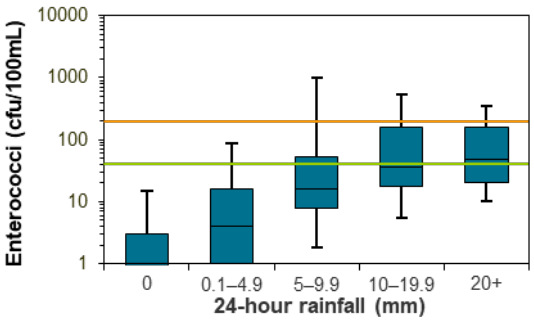
Microbial Assessment Category: B



Dry and wet weather water quality



Water quality in response to rainfall



Long Reef Beach

Beach grade: G

See 'How to read this report' for key to map.

Long Reef Beach is located near the entrance of Dee Why Lagoon. Lifeguards patrol the beach from September to April.

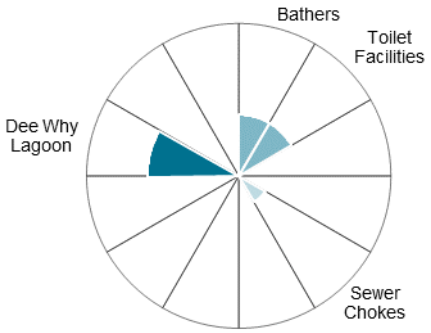
The Beach Suitability Grade of Good indicates microbial water quality is considered suitable for swimming most of the time but may be susceptible to pollution after rain, with potential faecal contamination from discharge from Dee Why Lagoon.

Enterococci levels generally increased with increasing rainfall, occasionally exceeding the safe swimming limit after 5 mm or more of rain, and often after 20 mm or more.

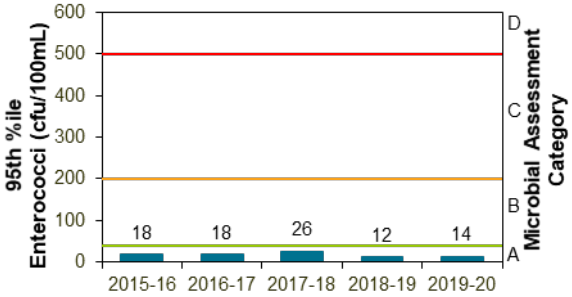
The site has been monitored since 1989.

Site type	Assessment period	Dry weather samples suitable for swimming	Water samples	Beach grade status
Ocean beach	Jul 2018 to Apr 2020	96%	100	Stable

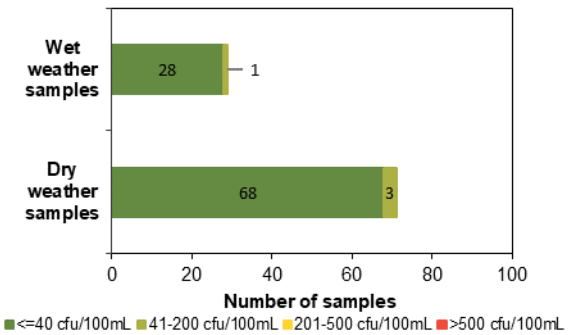
Sanitary inspection: Moderate



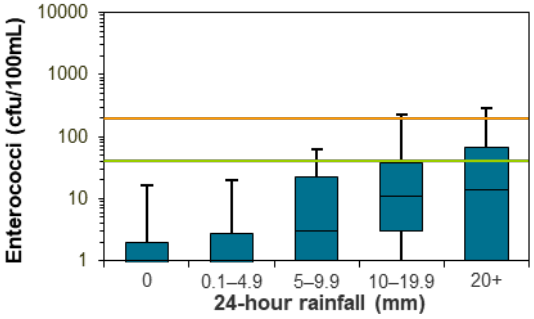
Microbial Assessment Category: A



Dry and wet weather water quality

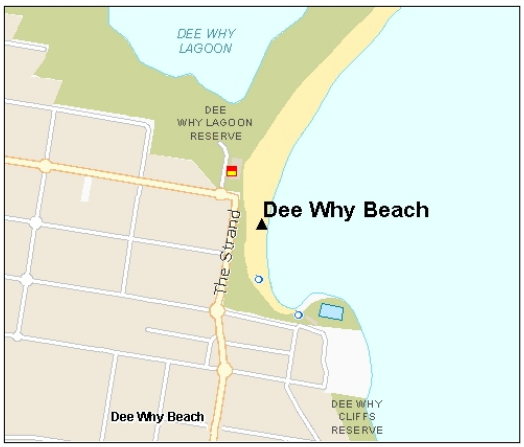


Water quality in response to rainfall



Dee Why Beach

Beach grade: VG



See 'How to read this report' for key to map.

Dee Why Beach is located at the southern end of the stretch of beach and is patrolled by lifeguards from late August to May.

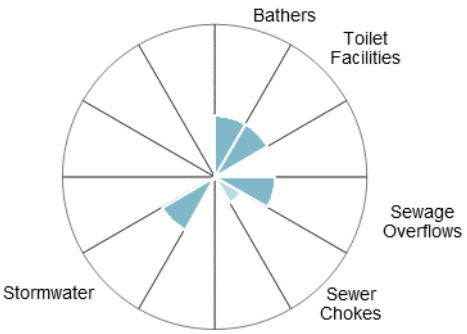
The Beach Suitability Grade of Very Good indicates microbial water quality is considered suitable for swimming almost all of the time, with few potential sources of significant faecal contamination.

Enterococci levels increased slightly with increasing rainfall, occasionally exceeding the safe swimming limit in response to 5 mm or more of rain and often after 20 mm or more.

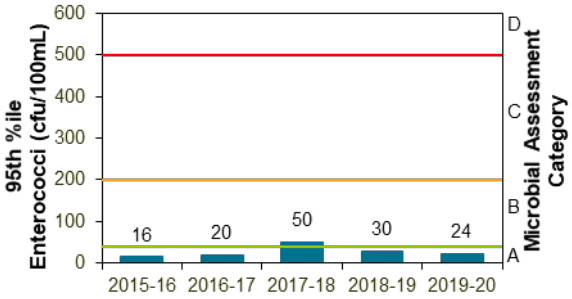
The site has been monitored since 1989.

Site type	Assessment period	Dry weather samples suitable for swimming	Water samples	Beach grade status
Ocean beach	Jul 2018 to Apr 2020	96%	100	Stable

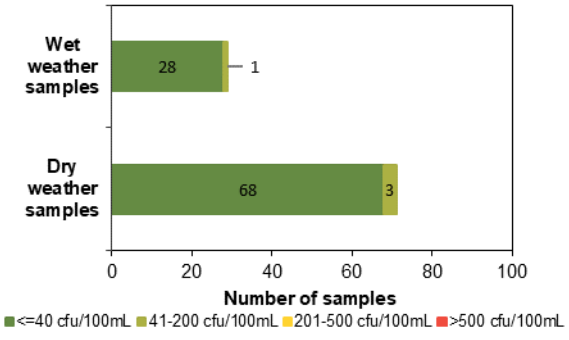
Sanitary inspection: Low



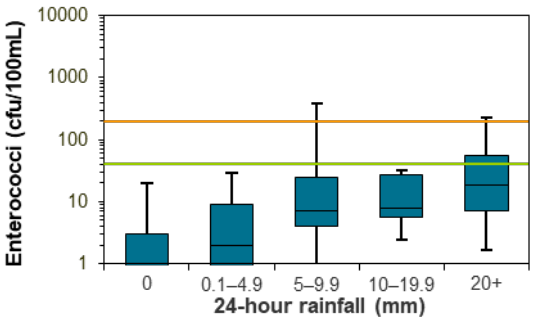
Microbial Assessment Category: A



Dry and wet weather water quality



Water quality in response to rainfall



North Curl Curl Beach

Beach grade: G

See ‘How to read this report’ for key to map.

North Curl Curl Beach is located near the entrance to Curl Curl Lagoon. Lifeguards patrol the beach from September to April.

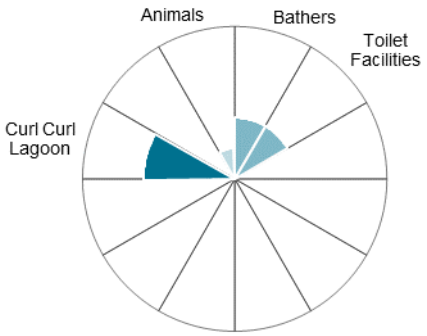
The Beach Suitability Grade of Good indicates microbial water quality is considered suitable for swimming most of the time but may be susceptible to pollution after rain, with several potential sources of faecal contamination including discharge from Curl Curl Lagoon.

Enterococci levels increased with increasing rainfall, often exceeding the safe swimming limit after 5 mm or more of rain and frequently after 20 mm or more.

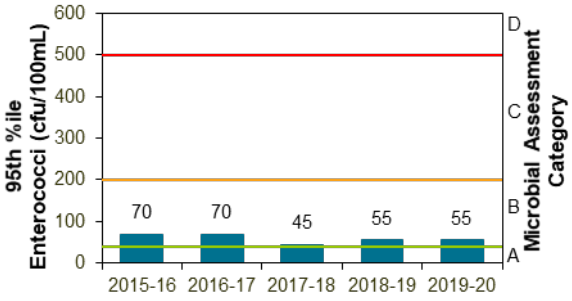
The site has been monitored since 1989.

Site type	Assessment period	Dry weather samples suitable for swimming	Water samples	Beach grade status
Ocean beach	Jul 2018 to Apr 2020	97%	100	Stable

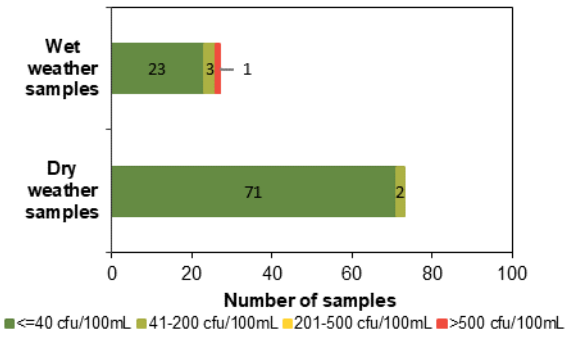
Sanitary inspection: Moderate



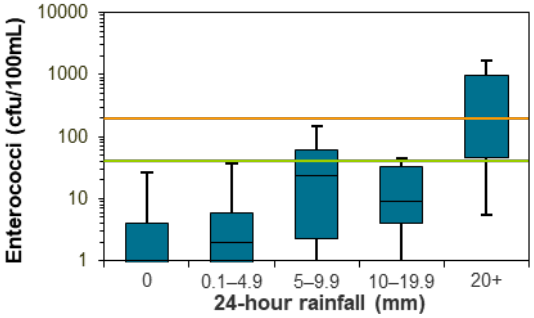
Microbial Assessment Category: B



Dry and wet weather water quality



Water quality in response to rainfall



South Curl Curl Beach

Beach grade: VG

See ‘How to read this report’ for key to map.

South Curl Curl Beach is at the southern end of Curl Curl Beach and is patrolled by lifeguards from September to April.

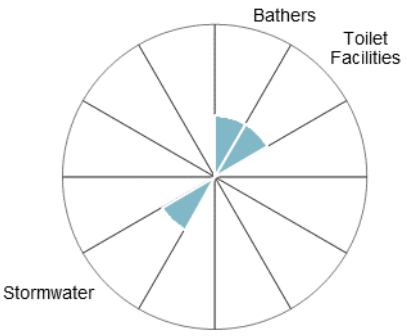
The Beach Suitability Grade of Very Good indicates microbial water quality is considered suitable for swimming almost all of the time, with few potential sources of faecal contamination.

Enterococci levels increased slightly with increasing rainfall, occasionally exceeding the safe swimming limit in response to 10 mm or more of rain, and often after 20 mm or more.

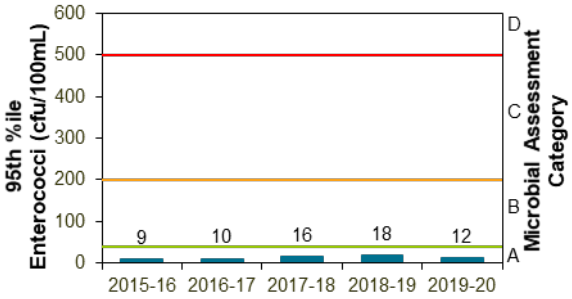
The site has been monitored since 1989.

Site type	Assessment period	Dry weather samples suitable for swimming	Water samples	Beach grade status
Ocean beach	Jul 2018 to Apr 2020	95%	100	Stable

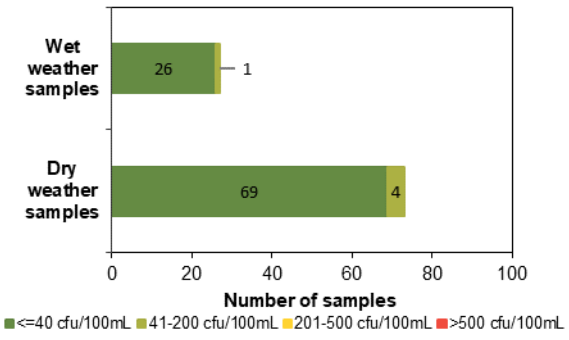
Sanitary inspection: Low



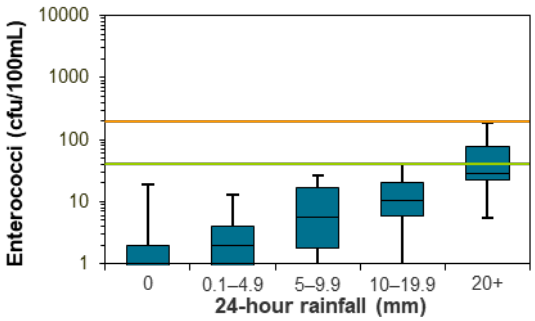
Microbial Assessment Category: A



Dry and wet weather water quality



Water quality in response to rainfall



Freshwater Beach

Beach grade: G

See ‘How to read this report’ for key to map.

Freshwater Beach is approximately 350 metres long and is patrolled by lifeguards from late August to May.

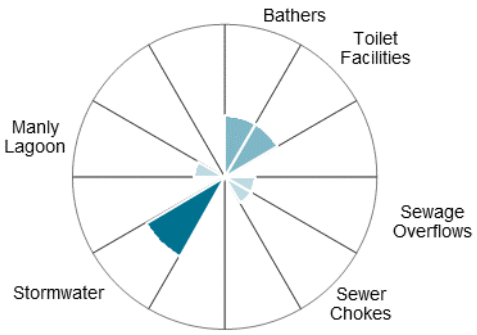
The Beach Suitability Grade of Good indicates microbial water quality is considered suitable for swimming most of the time but may be susceptible to pollution after rain, with several potential sources of faecal contamination including stormwater.

Enterococci levels generally increased with increasing rainfall, occasionally exceeding the safe swimming limit after 5 mm or more of rain, and frequently after 20 mm or more.

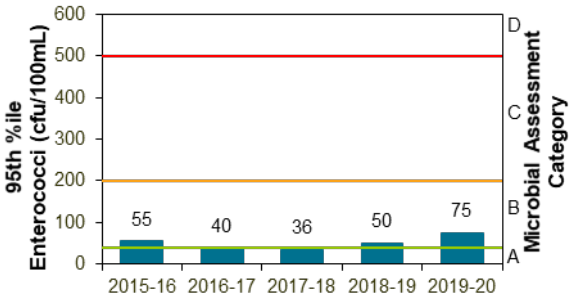
The site has been monitored since 1989.

Site type	Assessment period	Dry weather samples suitable for swimming	Water samples	Beach grade status
Ocean beach	Jul 2018 to Apr 2020	96%	100	Stable

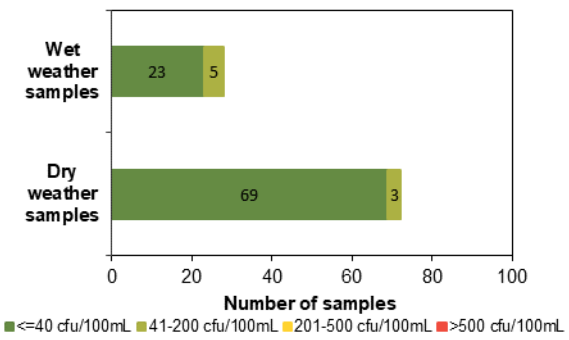
Sanitary inspection: Moderate



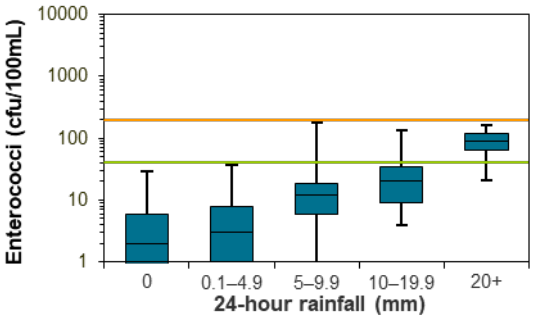
Microbial Assessment Category: B



Dry and wet weather water quality



Water quality in response to rainfall



Queenscliff Beach

Beach grade: G

See ‘How to read this report’ for key to map.

Queenscliff Beach is located at the northern end of Manly Beach. Lifeguards patrol the beach from September to April.

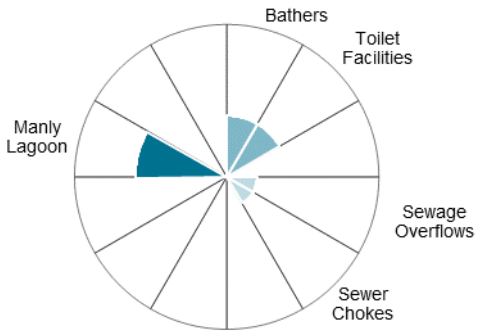
The Beach Suitability Grade of Good indicates microbial water quality is considered suitable for swimming most of the time but may be susceptible to pollution after rain, with several potential sources of faecal contamination, including discharge from Manly Lagoon.

Enterococci levels increased with increasing rainfall, occasionally exceeding the safe swimming limit after light rain, and often after 5 mm or more.

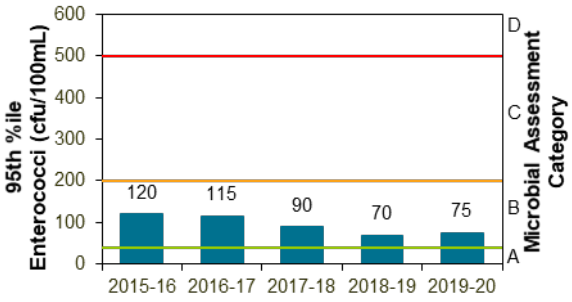
The site has been monitored since 1989.

Site type	Assessment period	Dry weather samples suitable for swimming	Water samples	Beach grade status
Ocean beach	Jul 2018 to Apr 2020	96%	100	Stable

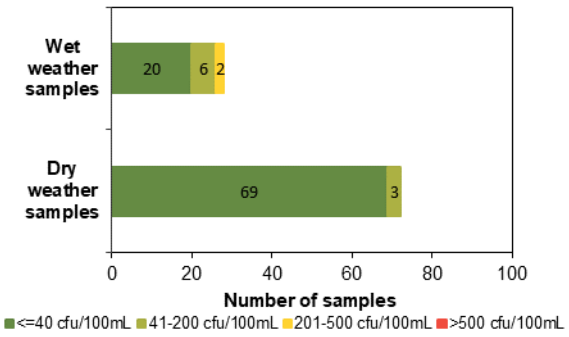
Sanitary inspection: Moderate



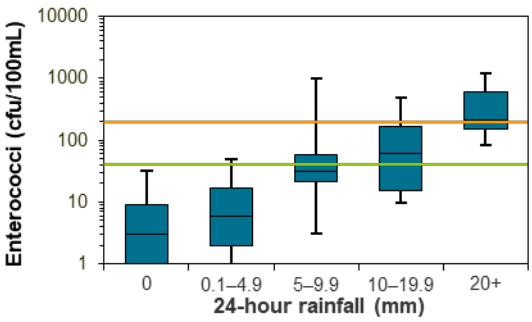
Microbial Assessment Category: B



Dry and wet weather water quality

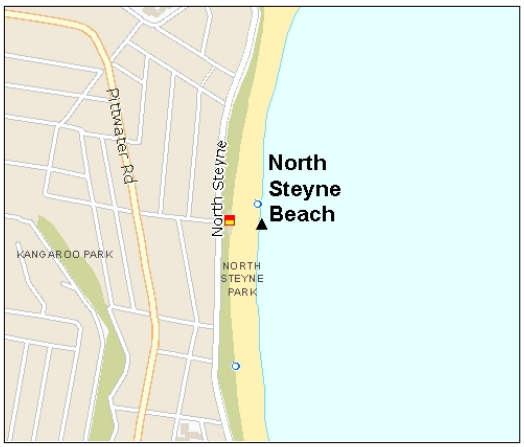


Water quality in response to rainfall



North Steyne Beach

Beach grade: G



See ‘How to read this report’ for key to map.

North Steyne Beach is the middle section of Manly Beach. Lifeguards patrol the beach from September to April.

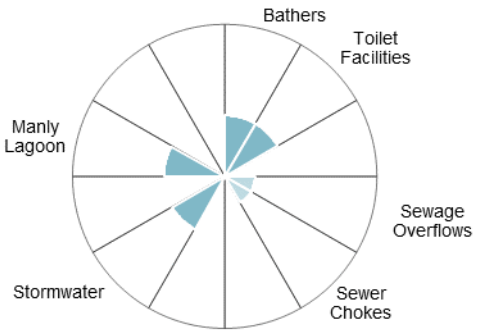
The Beach Suitability Grade of Good indicates microbial water quality is considered suitable for swimming most of the time but may be susceptible to pollution after rain, with several potential sources of faecal contamination including stormwater and discharge from Manly Lagoon.

Enterococci levels generally increased with increasing rainfall, occasionally exceeding the safe swimming limit after 5 mm or more of rain, and often after 10 mm or more.

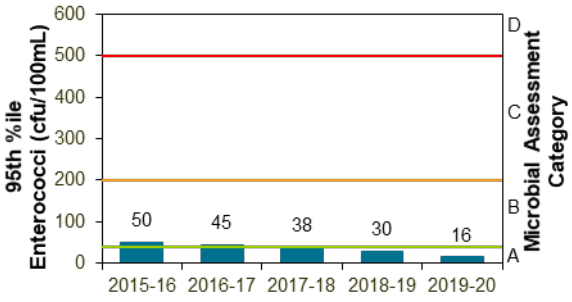
The site has been monitored since 1989.

Site type	Assessment period	Dry weather samples suitable for swimming	Water samples	Beach grade status
Ocean beach	Jul 2018 to Apr 2020	97%	100	Stable

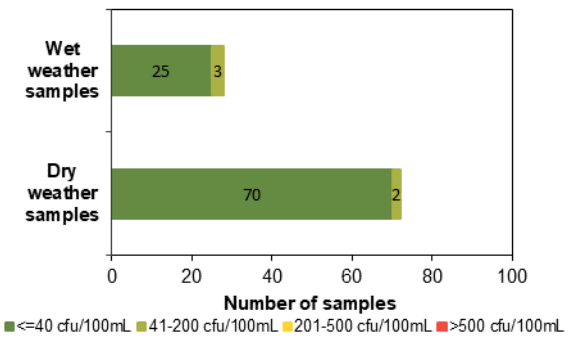
Sanitary inspection: Moderate



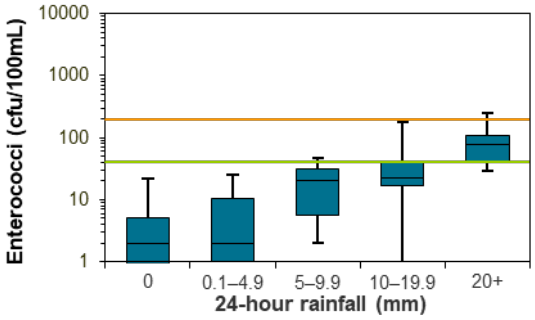
Microbial Assessment Category: A



Dry and wet weather water quality



Water quality in response to rainfall



South Steyne Beach

Beach grade: G

See 'How to read this report' for key to map.

South Steyne Beach is at the southern end of Manly Beach. Lifeguards patrol the beach year round.

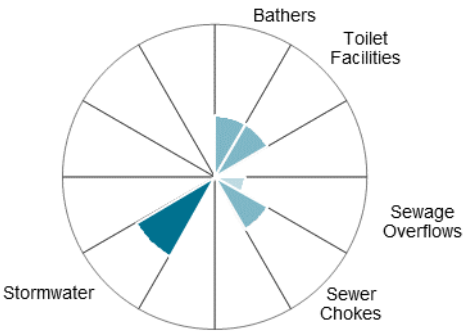
The Beach Suitability Grade of Good indicates microbial water quality is considered suitable for swimming most of the time but may be susceptible to pollution after rain, with several potential sources of faecal contamination including stormwater.

Enterococci levels increased with increasing rainfall, occasionally exceeding the safe swimming limit after no rain and often after 10 mm or more.

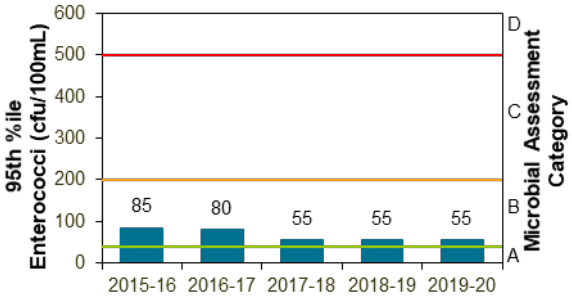
The site has been monitored since 1989.

Site type	Assessment period	Dry weather samples suitable for swimming	Water samples	Beach grade status
Ocean beach	Jul 2018 to Apr 2020	94%	100	Stable

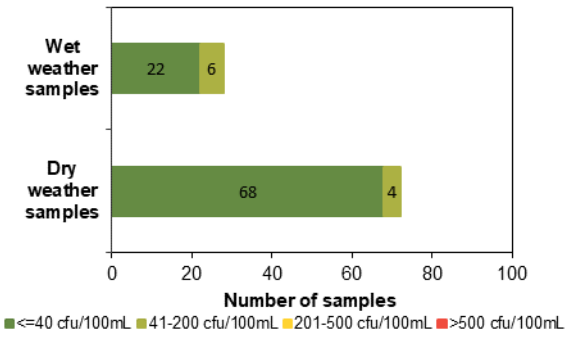
Sanitary inspection: Moderate



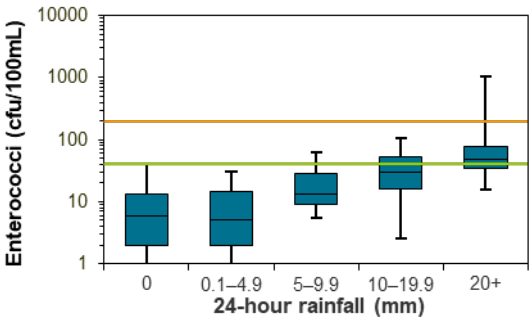
Microbial Assessment Category: B



Dry and wet weather water quality



Water quality in response to rainfall



Shelly Beach

Beach grade: G

See ‘How to read this report’ for key to map.

Shelly Beach is backed by a picnic area and reserve and is not patrolled by lifeguards.

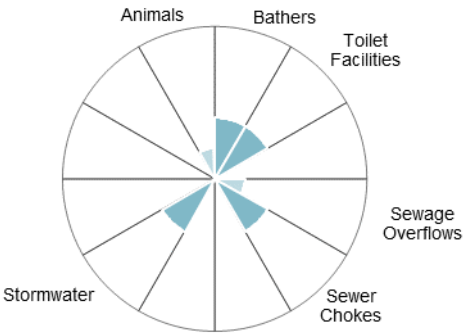
The Beach Suitability Grade of Good indicates microbial water quality is considered suitable for swimming most of the time, but may be susceptible to pollution after rain, with several potential sources of minor faecal contamination.

Enterococci levels increased with increasing rainfall, occasionally exceeding the safe swimming limit after light rain, and often after 5 mm or more.

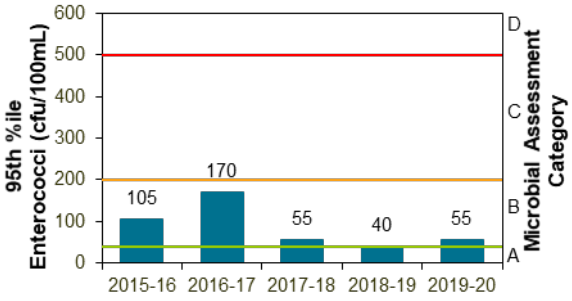
The site has been monitored since 1989.

Site type	Assessment period	Dry weather samples suitable for swimming	Water samples	Beach grade status
Ocean beach	Jul 2018 to Apr 2020	94%	100	Declined

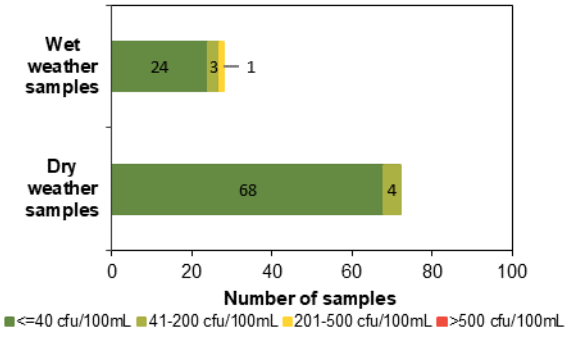
Sanitary inspection: Moderate



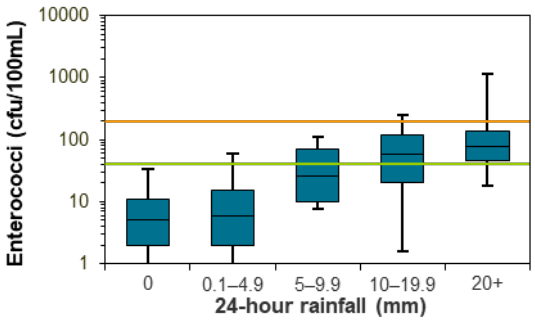
Microbial Assessment Category: B



Dry and wet weather water quality



Water quality in response to rainfall



Barrenjoey Beach

Beach grade: G

See ‘How to read this report’ for key to map.

Barrenjoey Beach is approximately 1.5 kilometres long and located on the north-eastern foreshore of Pittwater.

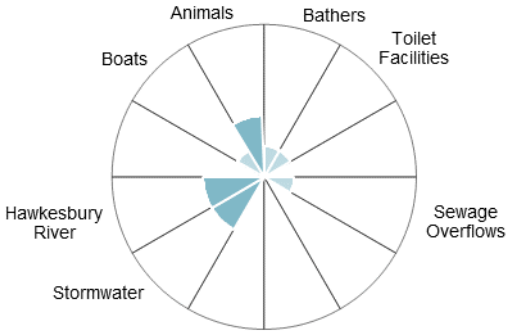
The Beach Suitability Grade of Good indicates microbial water quality is considered suitable for swimming most of the time but may be susceptible to pollution after rain, with several potential sources of faecal contamination.

Enterococci levels increased slightly with increasing rainfall, occasionally exceeding the safe swimming limit after little or no rain, and regularly after 20 mm or more.

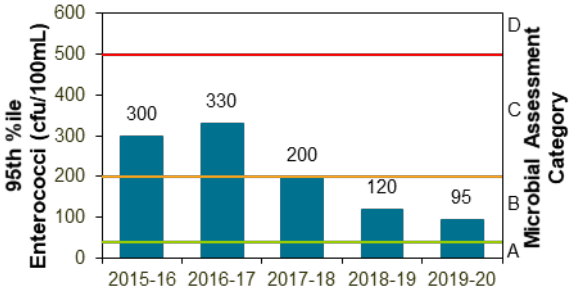
The site has been monitored since 1996.

Site type	Assessment period	Dry weather samples suitable for swimming	Water samples	Beach grade status
Estuarine	Nov 2017 to Apr 2020	87%	100	Stable

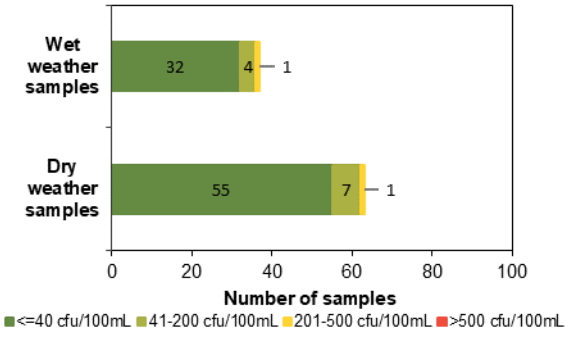
Sanitary inspection: Moderate



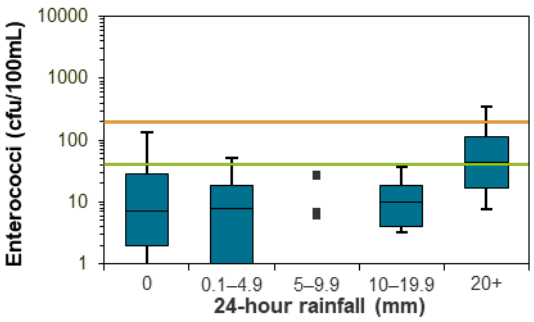
Microbial Assessment Category: B



Dry and wet weather water quality



Water quality in response to rainfall



Paradise Beach Baths

Beach grade: G

See ‘How to read this report’ for key to map.

Paradise Beach Baths is a 30 by 20 metre netted swimming enclosure on the eastern foreshore of Pittwater.

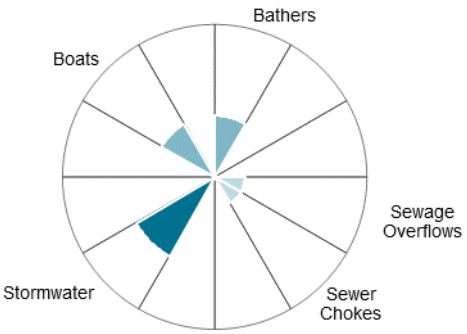
The Beach Suitability Grade of Good indicates microbial water quality is considered suitable for swimming most of the time but may be susceptible to pollution after rain, with several potential sources of faecal contamination including stormwater.

Enterococci levels increased with increasing rainfall, occasionally exceeding the safe swimming limit in response to light rain, and often after 10 mm or more.

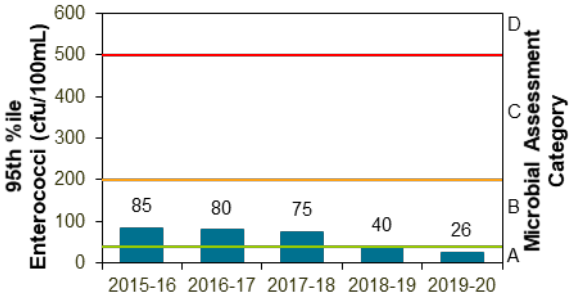
The site has been monitored since 1996.

Site type	Assessment period	Dry weather samples suitable for swimming	Water samples	Beach grade status
Estuarine	Nov 2017 to Apr 2020	98%	100	Stable

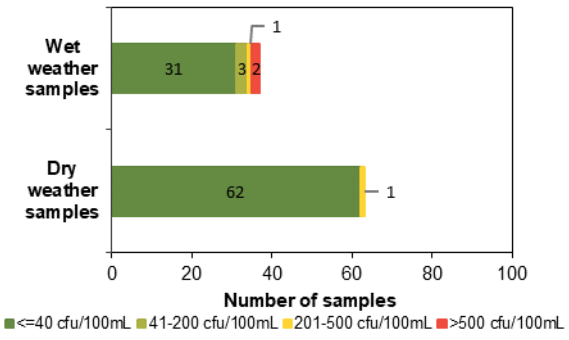
Sanitary inspection: Moderate



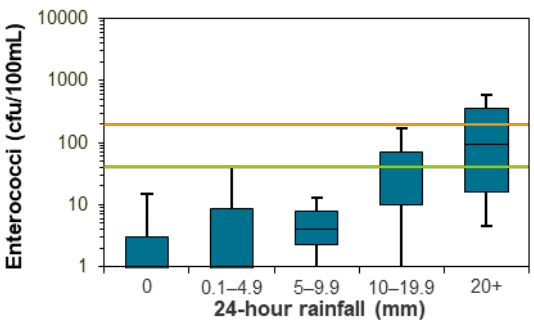
Microbial Assessment Category: A



Dry and wet weather water quality



Water quality in response to rainfall



Clareville Beach

Beach grade: G

See ‘How to read this report’ for key to map.

Clareville Beach is a narrow 250 metre long beach located on the eastern foreshore of Pittwater.

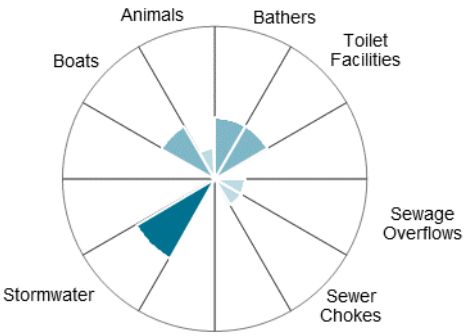
The Beach Suitability Grade of Good indicates microbial water quality is considered suitable for swimming most of the time but may be susceptible to pollution after rain, with several potential sources of faecal contamination including stormwater.

Enterococci levels generally increased with increasing rainfall, occasionally exceeding the safe swimming limit after 5 mm or more of rain, and regularly after 20 mm or more.

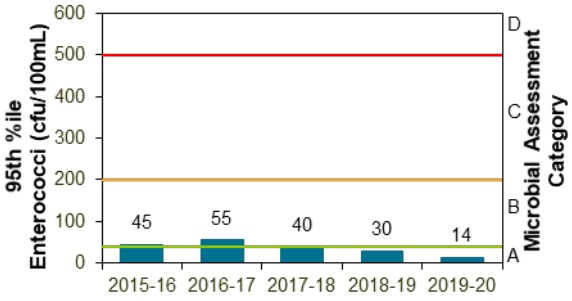
The site has been monitored since 1995.

Site type	Assessment period	Dry weather samples suitable for swimming	Water samples	Beach grade status
Estuarine	Nov 2017 to Apr 2020	100%	100	Stable

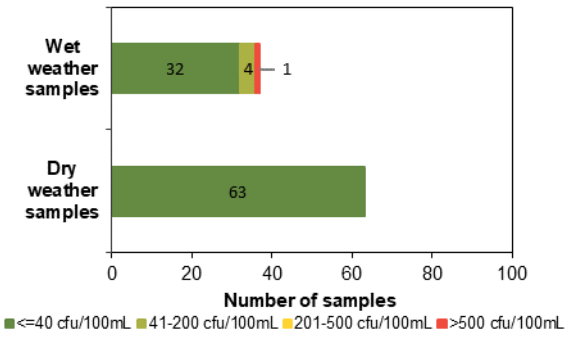
Sanitary inspection: Moderate



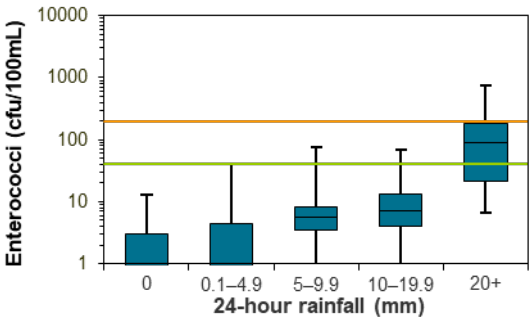
Microbial Assessment Category: A



Dry and wet weather water quality

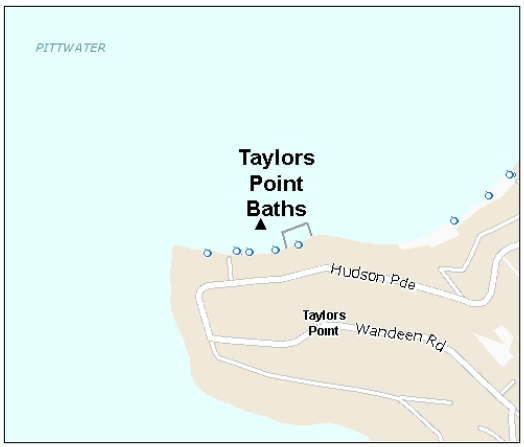


Water quality in response to rainfall



Taylors Point Baths

Beach grade: G



See 'How to read this report' for key to map.

Taylors Point Baths is a 15 by 20 metre netted swimming enclosure on the eastern foreshore of Pittwater.

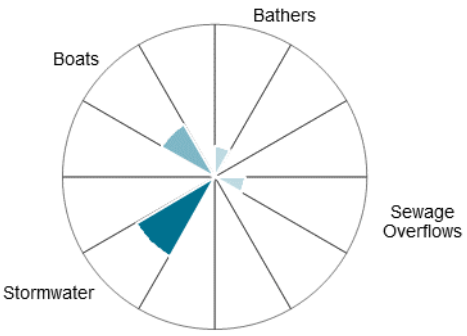
The Beach Suitability Grade of Good indicates microbial water quality is considered suitable for swimming most of the time but may be susceptible to pollution after rain, with several potential sources of faecal contamination including stormwater.

Enterococci levels generally increased with increasing rainfall, occasionally exceeding the safe swimming limit after 5 mm or more of rain, and regularly after 20 mm or more.

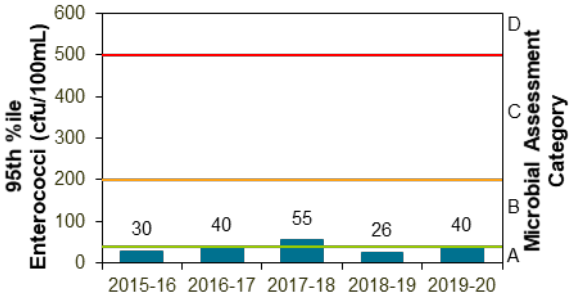
The site has been monitored since 2010.

Site type	Assessment period	Dry weather samples suitable for swimming	Water samples	Beach grade status
Estuarine	Nov 2017 to Apr 2020	100%	100	Stable

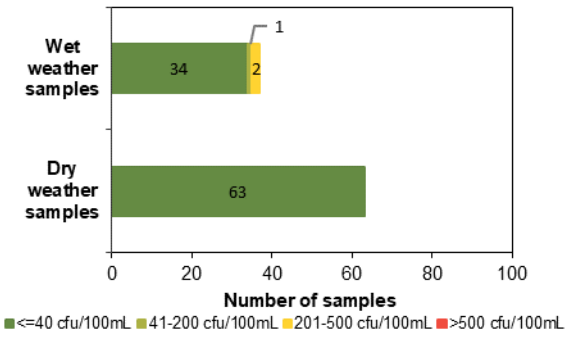
Sanitary inspection: Moderate



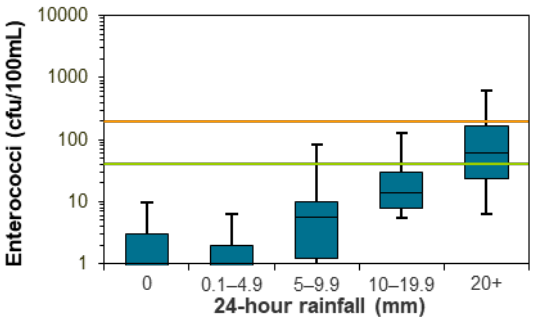
Microbial Assessment Category: A



Dry and wet weather water quality



Water quality in response to rainfall



Bayview Baths

Beach grade: G

See ‘How to read this report’ for key to map.

Bayview Baths is a 20 by 40 metre swimming enclosure on the southern foreshore of Pittwater.

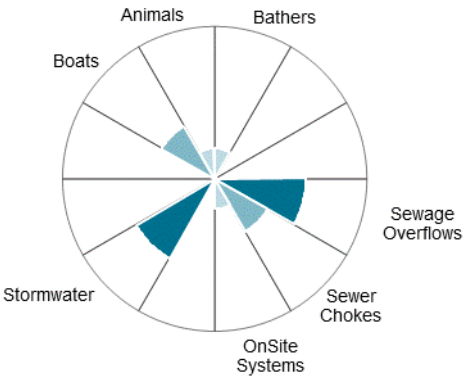
The Beach Suitability Grade of Good indicates microbial water quality is considered suitable for swimming most of the time but may be susceptible to pollution after rain, with several potential sources of faecal contamination including stormwater and sewage overflows.

Enterococci levels generally increased with increasing rainfall, occasionally exceeding the safe swimming limit after little or no rain, and usually after 20 mm or more.

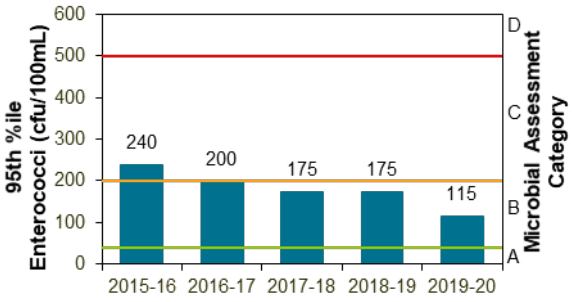
The site has been monitored since 1995.

Site type	Assessment period	Dry weather samples suitable for swimming	Water samples	Beach grade status
Estuarine	Nov 2017 to Apr 2020	90%	100	Stable

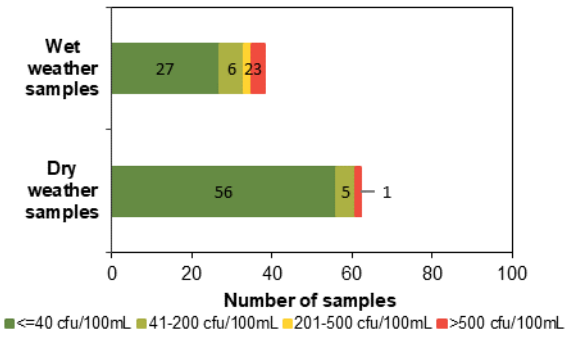
Sanitary inspection: Moderate



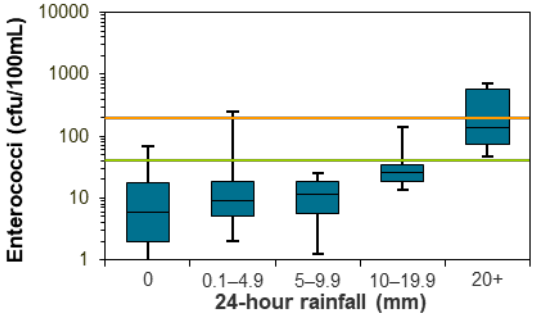
Microbial Assessment Category: B



Dry and wet weather water quality



Water quality in response to rainfall



Elvina Bay

Beach grade: VG

See ‘How to read this report’ for key to map.

Elvina Bay is located on the south-western foreshore of Pittwater. The swimming area is not netted.

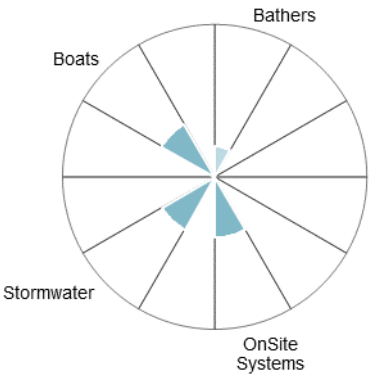
The Beach Suitability Grade of Very Good indicates microbial water quality is considered suitable for swimming almost all of the time, with few potential sources of significant faecal contamination.

Enterococci levels generally increased with increasing rainfall, occasionally exceeding the safe swimming limit after 10 mm or more of rain, and regularly after 20 mm or more.

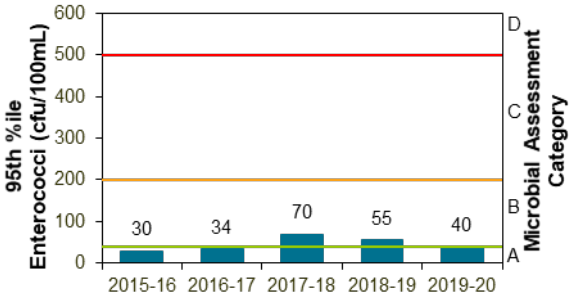
The site has been monitored since 1995.

Site type	Assessment period	Dry weather samples suitable for swimming	Water samples	Beach grade status
Estuarine	Oct 2017 to Mar 2020	100%	100	Improved

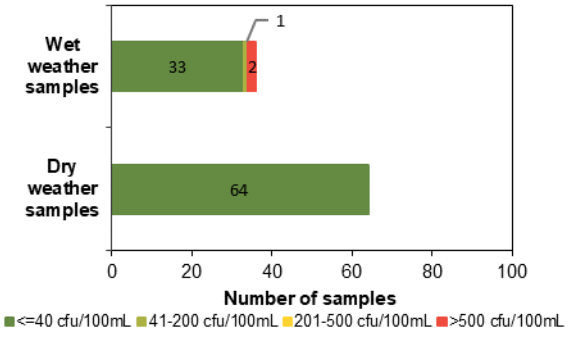
Sanitary inspection: Low



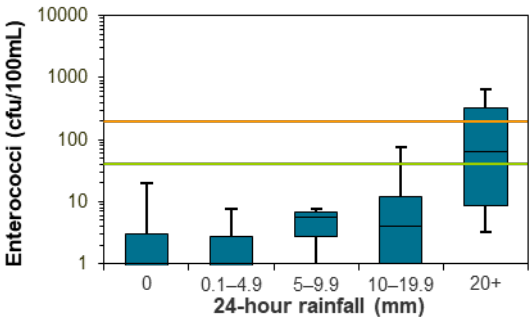
Microbial Assessment Category: A



Dry and wet weather water quality



Water quality in response to rainfall



North Scotland Island

Beach grade: G

See ‘How to read this report’ for key to map.

The North Scotland Island swimming site is a 15 by 50 metre netted enclosure located on the north side of Scotland Island in Pittwater.

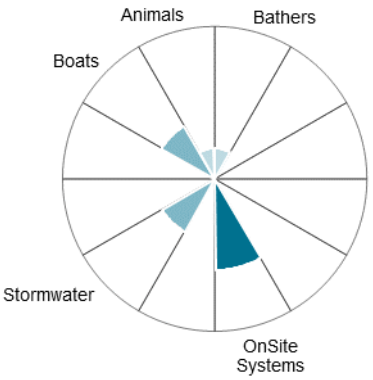
The Beach Suitability Grade of Good indicates microbial water quality is considered suitable for swimming most of the time but may be susceptible to pollution after rain, with several potential sources of faecal contamination including onsite systems.

Enterococci levels generally increased with increasing rainfall, regularly exceeding the safe swimming limit after 20 mm or more.

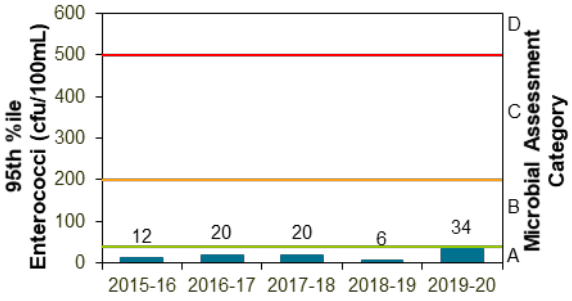
The site has been monitored since 1995.

Site type	Assessment period	Dry weather samples suitable for swimming	Water samples	Beach grade status
Estuarine	Oct 2017 to Mar 2020	100%	100	Stable

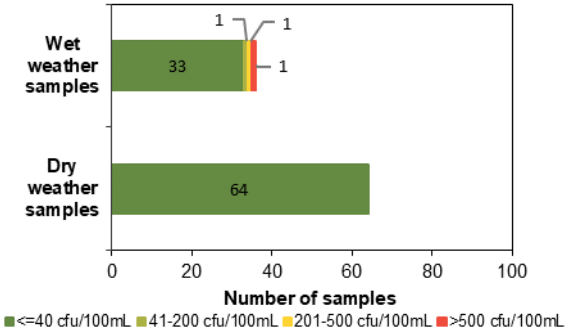
Sanitary inspection: Moderate



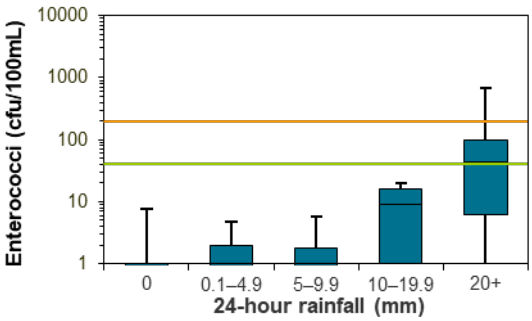
Microbial Assessment Category: A



Dry and wet weather water quality



Water quality in response to rainfall



South Scotland Island

Beach grade: G

See ‘How to read this report’ for key to map.

The South Scotland Island swimming site is located at Carols Wharf on the southern side of Scotland Island. The location is not netted and is backed by a reserve.

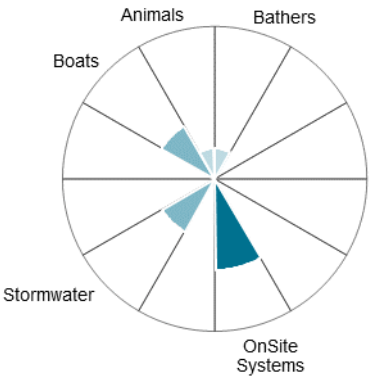
The Beach Suitability Grade of Good indicates microbial water quality is considered suitable for swimming most of the time but may be susceptible to pollution after rain, with several potential sources of faecal contamination including onsite systems.

Enterococci levels generally increased with increasing rainfall, regularly exceeding the safe swimming limit after 20 mm or more.

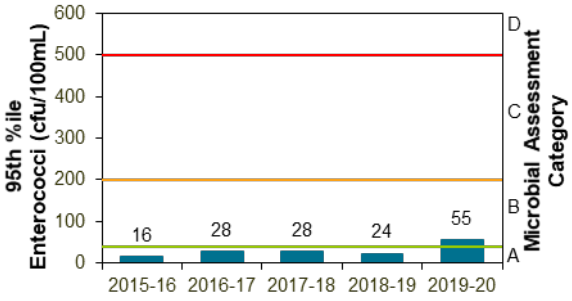
The site has been monitored since 1996.

Site type	Assessment period	Dry weather samples suitable for swimming	Water samples	Beach grade status
Estuarine	Oct 2017 to Mar 2020	98%	100	Stable

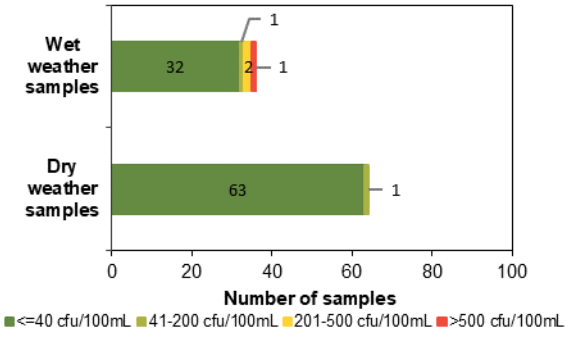
Sanitary inspection: Moderate



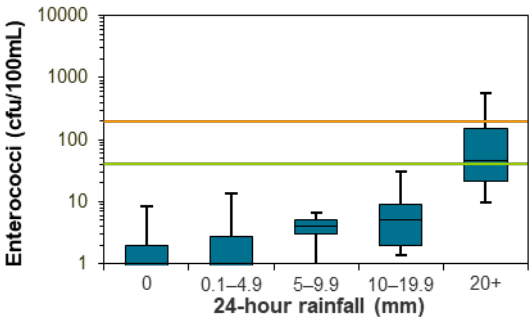
Microbial Assessment Category: B



Dry and wet weather water quality



Water quality in response to rainfall



The Basin

Beach grade: VG

See 'How to read this report' for key to map.

The Basin is a 500 metre sandy beach on the western side of Pittwater, backed by Ku-ring-gai Chase National Park.

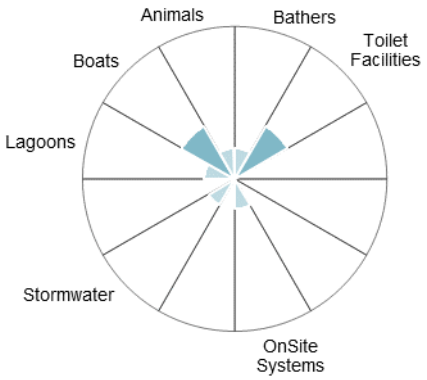
The Beach Suitability Grade of Very Good indicates microbial water quality is considered suitable for swimming almost all of the time with few potential sources of significant faecal contamination.

Enterococci levels increased slightly with increasing rainfall, occasionally exceeding the safe swimming limit in response to 20 mm or more.

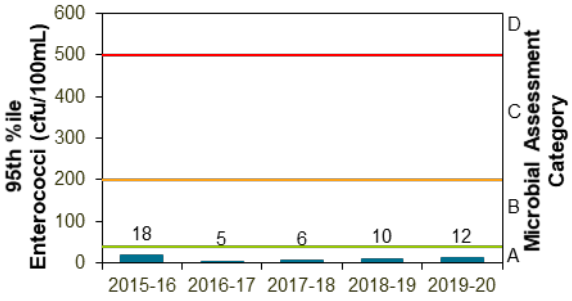
The site has been monitored since 1999.

Site type	Assessment period	Dry weather samples suitable for swimming	Water samples	Beach grade status
Estuarine	Oct 2017 to Mar 2020	100%	100	Stable

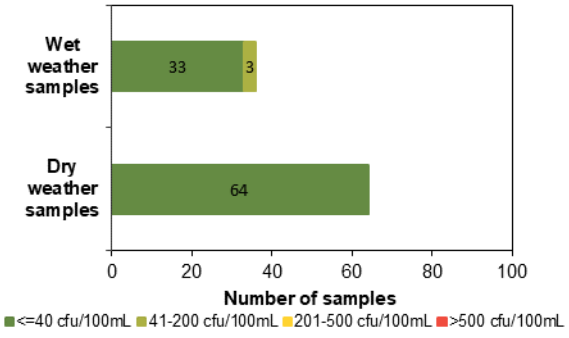
Sanitary inspection: Low



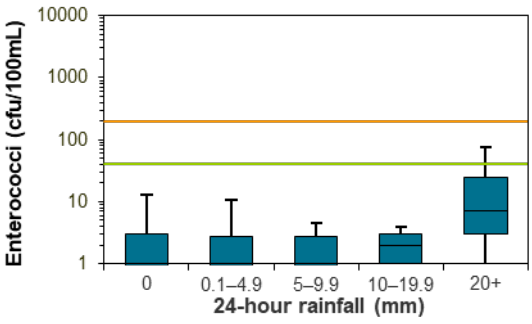
Microbial Assessment Category: A



Dry and wet weather water quality



Water quality in response to rainfall



Great Mackerel Beach

Beach grade: VG

See ‘How to read this report’ for key to map.

Great Mackerel Beach is a 500 metre long sandy beach on the north-western side of Pittwater.

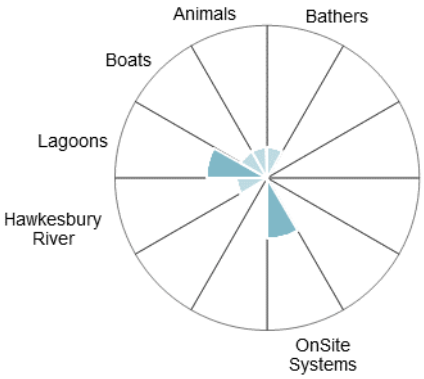
The Beach Suitability Grade of Very Good indicates microbial water quality is considered suitable for swimming almost all of the time with few potential sources of significant faecal contamination.

Enterococci levels increased slightly with increasing rainfall, occasionally exceeding the safe swimming limit in response to 20 mm or more.

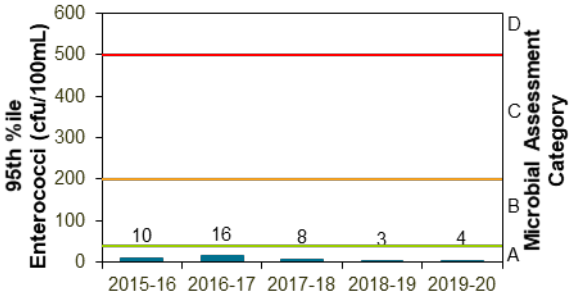
The site has been monitored since 1999.

Site type	Assessment period	Dry weather samples suitable for swimming	Water samples	Beach grade status
Estuarine	Oct 2017 to Mar 2020	100%	100	Stable

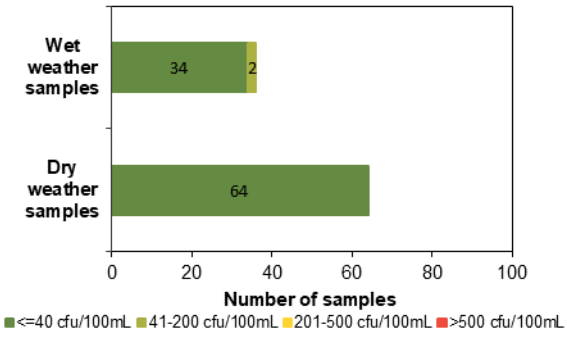
Sanitary inspection: Low



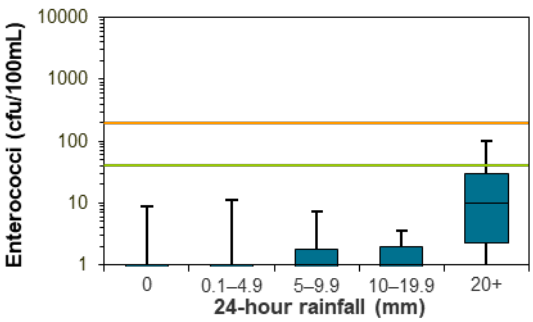
Microbial Assessment Category: A



Dry and wet weather water quality



Water quality in response to rainfall



Central Sydney (Bondi to Little Bay & Sydney Harbour)

Overall results

84%
swimming sites graded Good or Very Good

Thirty-one of the 37 swimming sites were graded as Very Good or Good in 2019–2020, a slight decline in performance from the previous year.

Percentage of sites graded as Very Good or Good:

- 2019–2020: 84%
- 2018–2019: 86%
- 2017–2018: 84%
- 2016–2017: 81%.

See the section on **How to read this report** on page 139 for an explanation of the graphs, tables and Beach Suitability Grades.

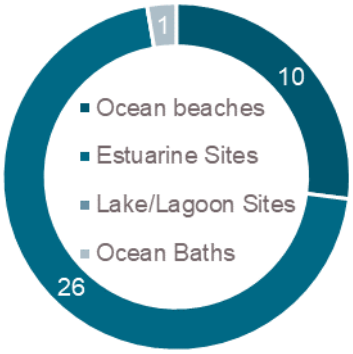
Beachwatch samples the ocean beaches every sixth day throughout the year, and the estuarine beaches every sixth day between October and April, and monthly from May to September.

Best beaches

Clovelly Beach, Nielsen Park and Camp Cove.

These sites had excellent water quality and were suitable for swimming almost all of the time.

Swimming sites monitored in the Central Sydney region include ocean beaches, an ocean baths, and estuarine areas in Sydney Harbour and lower Parramatta River, with each site type having a different response to rainfall-related impacts.



Site types in Central Sydney region

Estuarine swimming sites did not perform as well as ocean beaches due to lower levels of flushing, which increase the time needed to disperse and dilute pollution inputs, taking longer to recover from stormwater events.

As a general precaution swimming should be avoided during and for at least one day after heavy rain at ocean beaches, and for up to three days at harbour beaches, or if there are signs of stormwater pollution such as discoloured water or floating debris.

Ocean beaches

Beach Suitability Grades for Central Sydney ocean beaches

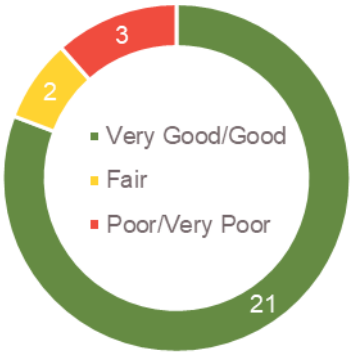
Nine of the 10 ocean beaches were graded as Very Good or Good.

Clovelly Beach was graded as Very Good in 2019–2020, a result consistent with previous years. Water quality is excellent at this beach and is suitable for swimming almost all of the time.

Bondi, Tamarama, Bronte, Gordons Bay, Coogee, Maroubra, South Maroubra and Little Bay beaches were graded as Good. Maroubra Beach was downgraded to Good from Very Good in the previous year. These sites were frequently suitable for swimming during dry weather conditions but recorded elevated enterococci levels following rainfall. Elevated enterococci levels were occasionally recorded at Coogee and Little Beach in dry weather.

Malabar Beach continued to be graded as Poor, a similar result to the previous five years. Elevated enterococci levels were occasionally measured during dry weather and often following light rainfall, and levels continued to increase with increasing rainfall. This beach takes longer to recover from stormwater events than surrounding areas. Lower levels of flushing increase the time needed to disperse and dilute pollution inputs, with elevated bacteria levels often recorded up to two days after rainfall. Further investigation is required to show the scale and extent of the problem, and the source of microbial contamination.

Estuarine beaches



Beach Suitability Grades for Central Sydney estuarine beaches

Nielsen Park and Camp Cove in Sydney Harbour were graded as Very Good, a similar result to previous years. These sites have excellent water quality, with few potential sources of faecal contamination, and are suitable for swimming almost all of the time. They are closer to the open ocean allowing any pollution inputs to be quickly diluted and dispersed.

Nineteen of the 26 estuarine swimming sites in Sydney Harbour were graded as Good: Watsons Bay, Parsley Bay, Murray Rose Pool, Dawn Fraser Pool, Chiswick Baths, Cabarita Beach, Woolwich Baths, Tambourine Bay, Woodford Bay, Greenwich Baths, Clifton Gardens, Balmoral Baths, Edwards Beach, Chinamans Beach, Clontarf Pool, Forty Baskets Pool, Fairlight Beach, Manly Cove and Little Manly Cove. These sites had mostly good water quality, although enterococci levels increased following rainfall.

Two estuarine swimming sites continued to be graded Fair: Northbridge Baths and Gurney Crescent Baths. These sites

have generally good water quality but more significant sources of microbial contamination including upstream sources in Middle Harbour.

Rose Bay and Hayes St beaches in Port Jackson and Davidson Reserve in the upper reaches of Middle Harbour were graded as Poor in 2019–2020. While this is a similar result for Rose Bay and Davidson Reserve to the previous year, Hayes St Beach was downgraded to Poor from a Good grade in the 2018–2019. The microbial water quality at Hayes St Beach has been consistently close to the threshold between Good and Poor grades and has alternated between Good and Poor grades for the last four years.

While water quality at Hayes St Beach and Davidson Reserve was frequently suitable for swimming during dry weather, with 96% and 91% of dry weather samples within the safe swimming limit, elevated bacterial levels were recorded following rainfall. These sites have several significant sources of faecal contamination and include upstream sources, stormwater and sewage overflows. Further investigation is required at poorer performing sites to show the scale and extent of the problem, and the source of microbial contamination.

Elevated enterococci levels at Rose Bay Beach were mostly recorded during and for up to three days after rainfall. During dry weather, water quality at Rose Bay Beach was frequently suitable for swimming, with 91% of dry weather samples within the safe swimming limit. Rose Bay Beach has several significant sources of faecal contamination including upstream sources, stormwater and sewage overflows. During 2019–2020, further investigation at Rose Bay Beach found that microbial pollution in Rose Bay is largely from human sewage contaminating the stormwater drains discharging to the beach, particularly after rain.

Estuarine sites are not as well flushed as ocean beaches, and so can take longer to recover from stormwater events. As a precaution, swimming should be avoided at Sydney Harbour swimming sites during and for up to three days following rainfall or if there are signs of pollution such as discoloured water, flowing stormwater drains or floating debris.

Ocean baths

Beach Suitability Grades for Central Sydney ocean baths

South Maroubra Rockpool was graded as Good in 2019–2020, a result consistent with previous years. Water quality is mostly suitable for swimming during dry weather conditions, with 89% of dry weather samples within the safe swimming limit. Elevated enterococci levels were often recorded during and for up to one day following rainfall. Swimming should be avoided when the stormwater drain is discharging to the site, or if there are any signs of pollution such as discoloured water or floating debris.

Management

Patrolled ocean beach
Photo: Beachwatch/EES, DPIE

A **Coastal Management Program** (CMP) outlines a long-term strategy for managing the coast, in line with the *Coastal Management Act 2016*.

The NSW Government provides guidance and funding through the Coastal and Estuary Grants Program for local councils to prepare and implement CMPs.

Under the previous *Coastal Protection Act 1979*, councils developed a **Coastal Zone Management Plan** (CZMP) to address coastal issues. Councils can continue to implement priority actions from certified CZMPs with funding assistance from the NSW Government's Coastal and Estuary Grants Program until 2021.

Ocean beaches

In 2019, the NSW Government committed $2.5 million for the diversion of stormwater from Coogee Beach to improve water quality and the marine environment. The NSW Government has provided $500,000 to Randwick City Council for project planning and detailed design of the preferred option to divert stormwater from Coogee Beach. The intention of the Government is that further payment will be subsequent to negotiation and agreement to the project design by the Coogee Beach Working Group.

With funding from the NSW Government's Coastal and Estuary Grants Program, Woollahra, Waverley and Randwick City councils have prepared the first stage of the Eastern Sydney Beaches Coastal Management Program (CMP), the scoping study. The development of a CMP will allow the councils to identify coastal hazards (which could include some water quality management actions) and prioritise initiatives to manage these.

Waverley Council

Gross pollutant traps (GPTs) have been installed in the Bondi Beach, Bronte Beach, Clovelly Beach, Coogee Beach, Maroubra Beach, Malabar Beach and Little Bay catchments.

The Bronte Stormwater Harvesting Scheme collects and treats stormwater which is then re-used for toilets, park irrigation and ocean pool cleaning. The scheme saves over 16 million litres of water each year and reduces the volume of stormwater discharged to Bronte Beach.

The Bondi Stormwater Harvesting Scheme commenced in 2012 and supplies approximately 50 million litres of treated stormwater for park irrigation and toilets in Bondi Pavilion and South Bondi. An underground filtration system has also been installed to treat excess stormwater runoff from Campbell Parade, resulting in cleaner water at Bondi Beach.

The Tamarama Stormwater Harvesting Scheme commenced operation in December 2015 supplying treated stormwater for park irrigation and toilets in Tamarama Park. The scheme supplies approximately 14 million litres of water each year and reduces the volume of stormwater discharged to Tamarama Beach. As part of the scheme, a large capacity underground sediment basin has also been installed to prevent sediment and other pollutants from entering the ocean at Tamarama Beach.

Tamarama Beach
Photo: Beachwatch/EES, DPIE

Both Bronte and Bondi stormwater schemes were built by Waverley Council with support from the NSW Government's Climate Change Fund.

Randwick City Council

Randwick City Council operates and maintains 13 stormwater harvesting treatment systems with UV filtration across the local government area. These systems treat stormwater by removing suspended solids, bacteria and other organic and inorganic materials before it is used for irrigation in surrounding landscaped and garden areas, reducing stormwater discharging to the beaches.

In March 2020, Randwick City Council commenced construction of a new stormwater harvesting system at Maroubra foreshore to improve the water quality at Maroubra Beach and South Maroubra Rockpool. This includes the installation of two, one million litre underground storage tanks to capture, treat and deliver over 40 million litres of stormwater to council parks, playing fields and toilets, stretching from Jack Vanny Reserve in the north, to Arthur Byrne Reserve in the south.

Randwick City Council maintains 34 GPTs on stormwater lines leading to the local bays, which are all cleaned regularly. Randwick City Council conducted a GPT audit in 2017 to assess the condition of all GPTs to ensure they are working efficiently and propose rectification work where required. In 2019–2020, approximately 230 tonnes of material was removed from these GPTs. There is also a systematic cleaning program for all drainage pits including a regular street sweeping program which assists with reducing stormwater pollution to the local bays. Randwick City Council continues to conduct litter education campaigns throughout the local government area to educate residents on the proper disposal of waste. This program aims to reduce the amount of litter disposed on beaches and entering the ocean. The council also commenced a cigarette butt litter program in April 2018, aiming to reduce cigarette litter at beaches.

Randwick City Council has a strategic program and reactive process to monitor and assess the condition of the stormwater pipes in the local area using CCTV.

The Coogee Beach Stormwater Quality Working Group was established in 2017 to improve water quality at Coogee Beach. The group consists of representatives from the community, Sydney Water, Beachwatch, University of NSW, council staff and the State Member for Coogee. In August 2017, the working group put recommendations to council, which have been adopted and are being implemented. This includes investigating the feasibility of diverting more stormwater from the beach, and the development of a community education and marketing campaign to better inform the local community about stormwater and its impact on local beaches. The campaign aims to empower local residents to take action to reduce stormwater pollution and has been launched for the 2020–2021 summer period.

Clovelly Beach
Photo: Beachwatch/EES, DPIE

Council officers undertake their routine inspections and regulatory duties to ensure stormwater pollution is investigated and mitigated to reduce impacts to the water quality of local recreational waterways.

In 2015–2016 the Commonwealth Government installed a leachate control system on the southern boundary of Malabar Headland (which is on the northern side of the Malabar WWTP) to address the leachate impacted groundwater that migrates across the site towards Long Bay. The works will mitigate health and safety risks by containing contaminants on the Malabar Headland site and will improve the environmental values on Malabar Beach.

Sydney Water

Sydney Water investigated wet weather sewage overflows in the Coogee Beach catchment and found that silt was accumulating within the Coogee Diversion Sewer (CDS) due to the very low slope of this sewer. As a result, Sydney Water is undertaking more frequent de-silting of the CDS and the grit pits at the northern end of the beach. This work will increase the capacity of the CDS and reduce the occurrence of overflows.

Sydney Water has inspected, cleaned and repaired sewer mains that have a high likelihood of discharging sewage to waterways if they become blocked. When significant tree root intrusion to the public sewer from the private sewer was identified, property owners were requested to remedy the problem.

Sydney Harbour

Sampling at Rose Bay
Photo: Beachwatch/EES, DPIE

In 2019, the NSW Government committed $150,000 to address the poor recreational water quality at Rose Bay Beach. The NSW Department of Planning, Industry and Environment (DPIE), in collaboration with the University of Technology Sydney, conducted a catchment investigation applying enterococci and genetic marker assay methods for a detailed audit of sources of contamination. The project identified that microbial pollution in Rose Bay is largely from human sewage, which contaminates stormwater particularly after rain. Extensive water quality testing in the drainage network located areas of elevated bacteria levels, indicating where sewage is entering the stormwater drains, and identifying priority areas for remediation. The outcomes of the investigation will be used to focus remediation efforts in the catchment and help design and implement management strategies to resolve water quality issues at the beach.

Under the leadership of Greater Sydney Local Land Services, a consortium of state agencies, Sydney Water and 17 Sydney Harbour councils prepared the Greater Sydney Harbour Coastal Management Program (CMP) Stage 1 Scoping Study and have also completed the Greater Sydney Harbour Estuary Processes Study, which contributes to Stage 2 of the CMP process and will inform Stage 3. Both studies were supported with funding from the NSW Government's Coastal and Estuary Grants Program.

The Sydney Coastal Council's Group (SCCG), together with a working group made up of representatives from the Parramatta River Catchment Group (PRCG) and DPIE, is leading the development of the remainder of the CMP. The program will identify catchment pressures and prioritise management initiatives for issues relating to coastal and estuary health. Water quality management actions such as stormwater infrastructure improvements, restoring and maintaining riparian areas, and strategic land-use planning will be considered during the process.

The Lane Cove River Coastal Zone Management Plan (CZMP) is implemented by local councils including Lane Cove, Hunters Hill, Ryde and Willoughby City.

Parramatta River Estuary CZMP is being implemented by several councils including Cumberland City, (formerly Auburn), City of Canada Bay, Hunters Hill, Parramatta City, Inner West (formerly Ashfield and Leichhardt), City of Ryde and Strathfield. With funding from the NSW Government's Coastal and Estuary Grants Program, many of the actions from the CZMP have been completed, including the installation of a GPT and bush regeneration to improve water quality in Tarban Creek in the Hunters Hill local government area. Further sediment and weed removal work is being

undertaken at Tarban Creek to remediate the coastal saltmarsh and mangroves.

Northern Beaches Council

Fairlight Beach
Photo: Beachwatch/EES, DPIE

Northern Beaches Council proactively inspects and cleans out 242 stormwater quality improvement devices in the local government area. Work is continuing to standardise measurement of gross pollutants and debris and improve data management across the amalgamated council. During 2018–2019, a new GPT was constructed at East Esplanade, Manly to reduce litter, leaf litter and sediment entering North Harbour. Council also replaced six end-of-pipe trash nets and completed other minor renewal works in the local government area.

Northern Beaches Council maintains a constructed raingarden within East Esplanade Reserve. The raingarden eases localised flooding and removes nutrient loads from stormwater before it enters Manly Cove.

Mosman Council

Mosman Council's Botanic Road Stormwater Re-use Scheme is an underground storage system that captures stormwater and provides UV disinfection, after which it is pumped to Balmoral Oval and Balmoral Reserve for irrigation.

Mosman Council has installed educational signage at beaches in the area advising not to swim for up to three days after heavy rain due to the potential for pollution from stormwater. Stormwater quality improvement devices are installed at Balmoral Beach, Clifton Gardens, Edwards Beach and Chinamans Beach to capture sediment and floating debris.

Balmoral Baths
Photo: Beachwatch/EES, DPIE

Council has installed stormwater quality improvement devices at more than 75% of stormwater outlet points. These devices capture sediment and floating debris from stormwater before it enters the waterways.

Mosman Council continued implementation of the 'There's no such thing as the Dog Poo Fairy' education campaign to raise awareness amongst dog owners of their responsibilities in picking up after their dog, which has led to an increase in responsible behaviour that assists in keeping the beaches and waterways clean. Over the past five years, since program implementation, there has been significantly less dog poo found in reserves and parks. Council also offers residents pooch pouches that tie onto the leash and make dog poo bags easily accessible.

Mosman Council continues to implement HarbourCare and HarbourCare Teen volunteer programs. The programs help residents and teenagers be actively involved in collecting rubbish along the Mosman foreshore. Data on the rubbish collected is collated and reported back to council. Mosman Council then uses this data to help in the development of education programs. As part of Clean Up Australia Day 2020 twenty-five 100 litre bags of debris was removed from the foreshore areas at Quakers Hat Bay and Chinamans Beach.

Council continues to maintain natural riparian areas to protect vegetation and improve water quality in Sydney Harbour.

Mosman Council runs a series of Beach Pop Up stalls and events promoting litter reduction, specially targeting cigarette butts, fishing tackle and outdoor party litter.

Willoughby City Council

Willoughby City Council has signage at Northbridge Baths to advise the community not to swim during and for up to 48 hours after rainfall due to potential stormwater pollution.

Northbridge Baths
Photo: Beachwatch/EES, DPIE

The council has a draft water plan that includes the management of GPTs. Council is halfway through a four-year schedule of works, repairing and building new GPTs throughout the local government area. Council has increased its cleansing of GPTs and has contractors undertaking regular hand cleaning of creeks.

Willoughby City Council is undertaking water quantity and quality monitoring in Flat Rock Creek to obtain data for a future stormwater harvesting project at Bicentennial Oval. This will complement council's existing stormwater harvesting plant at Artarmon reserve.

North Sydney Council

North Sydney Council has constructed several raingardens and other water sensitive urban design structures to improve stormwater quality and reduce its velocity to receiving waters. The council undertakes regular catchment water quality monitoring. Council also supports beach, foreshore and water clean-ups, including through HarbourCare volunteers, who are concerned about pollution in Sydney Harbour and its effect on marine and bird life.

In 2019 North Sydney Council's GPTs and litter baskets intercepted an average of 0.82 tonnes per hectare from reaching the harbour. In combination with street drain pit cleaning, street sweeping and the community volunteer HarbourCare clean-up program, 3582 tonnes of materials

were removed from the North Sydney stormwater system in 2019.

In 2019 council launched the ‘Speak for the Creek’ initiative in response to a significant pollution incident that resulted in the death of several short finned eels. The initiative provided information about creek health and stormwater pollution and encouraged residents to report pollution incidents.

North Sydney Council’s Stormwater Re-use Project continues to harvest, treat and re-use stormwater for the irrigation of sports fields and recreational parks, including St Leonards Park, Cammeray Park, Forsyth Park, Primrose Park and Tunks Park. This saves millions of litres of potable water, improves the quality and reduces the amount of stormwater entering the waterways.

Lane Cove Council

Woodford Bay
Photo: Beachwatch/EES, DPIE

Lane Cove Council maintains a number of GPTs in the catchment to reduce the impact of stormwater to the waterways. In 2019–2020 more than 46 tonnes of material was prevented from entering the Lane Cove River. Over 80% of this material was recycled.

With funding from the NSW Government’s Coastal and Estuary Grants Program, Lane Cove Council completed Stage 2 of the stormwater improvement works at Lane Cove Bushland Park, an action from the Lane Cove CZMP. This work will improve the infrastructure for three drainage lines into Gore Creek, as well as stabilise the creek bed and protect endangered ecological communities in the vicinity.

Hunters Hill Council

Hunters Hill Council maintains 24 stormwater quality improvement devices in the local government area. Council will assess the condition of stormwater assets as part of the Asset Management Plan currently being prepared. This will ensure stormwater assets are routinely inspected and well maintained into the future.

City of Canada Bay Council

The City of Canada Bay maintains over 27 stormwater quality improvement devices which prevent over 150 tonnes of pollutants (sediments, leaves and litter) from reaching the Parramatta River each year. Stormwater harvesting, rainwater re-use and raingardens have been constructed in the Drummoyne Oval precinct to reduce stormwater and pollutant loads reaching Five Dock Bay.

The *Our Water for Our Community* stormwater recycling scheme at Cintra Park, completed in October 2015, harvests and re-uses stormwater for the irrigation of two public golf

courses and 15 sporting fields. This reduces the City of Canada Bay's reliance on potable water by 180 million litres each year, and improves the quality and reduces the quantity of runoff into Canada Bay itself.

As part of the Parramatta River Catchment Group (PRCG) mission to make the Parramatta River swimmable again, the City of Canada Bay is in the planning stages of activating two new sites to provide greater access to the river. At Bayview Park, Concord Council are planning to reintroduce a netted swimming enclosure adjacent to the natural sandy beach. Replacement of the seawall with a new environmentally friendly design at McIlwaine Park, Rhodes will provide the opportunity for splash contact in newly constructed rock pools and provision of launch facilities for water activities such as kayaking, rowing and stand-up paddle boarding.

Woollahra Municipal Council

Parsley Bay
Photo: Beachwatch/EES, DPIE

Woollahra Municipal Council undertakes a range of projects to improve water quality at its harbour beaches. Council is continually upgrading stormwater infrastructure, installing and maintaining GPTs, litter nets, raingardens to remove contaminants from stormwater, porous paving infiltration systems, and stormwater harvesting systems. Street sweeping, beach cleaning, riparian vegetation and terrestrial bushland regeneration activities continue to contribute to improved stormwater quality at Woollahra's beaches.

The Rose Bay Beach Working Party was established in 2017 to address water quality issues at Rose Bay Beach. The working party consists of representatives from DPIE, Transport for NSW (Maritime), council, Sydney Water and the Member for Vaucluse.

Council undertakes a range of programs to educate the community about ways they can improve water quality, from picking up dog droppings to undertaking water sensitive urban design. In addition, council has implemented a HarbourCare program, which supports volunteers to undertake clean-ups of beachside areas.

Council received a litter reduction grant from the NSW Government and is rolling out a community education program across harbour-side beaches. This program includes community clean-up events in partnership with 'Splash Without the Trash', working with the Cruising Yacht Club of Australia to install a number of seabins to capture litter in the Rushcutters Bay marina area, and installing cigarette butt bins and educational signage.

In 2019–2020, council installed two GPTs in the Rose Bay catchment to capture pollution before it enters Sydney Harbour. Council also undertook an extensive review of the drainage system leading to Rose Bay Beach, to identify any

issues that may result in pollution. Council undertook a review of all GPTs across the local government area, to ensure they are able to work at peak capacity. A number of improvements were identified in this review and are now being implemented. Council is also currently rolling out upgrades to raingardens, to ensure they effectively capture and treat first-flush stormwater runoff.

Council has been investigating the potential to naturalise a section of the Rose Bay Channel that runs through Woollahra Golf Club, including installation of a wetland area to treat stormwater runoff. In the Double Bay catchment, council engaged expert catchment management consultants to study stormwater runoff and prepare a water management plan for the Cooper Park catchment area. Over the next year, council will implement the actions arising from this plan, which will result in improvement to water quality in Double Bay.

Inner West Council

Dawn Fraser Pool
Photo: Beachwatch/EES, DPIE

Inner West Council owns and maintains several stormwater quality improvement features including raingardens, constructed wetlands and GPTs to filter and clean stormwater runoff in the catchments before discharging to Parramatta River, Sydney Harbour and the Cooks River.

Council is collaborating with residents along the Cooks River to develop sub-catchment water quality plans and intends to begin planning for select catchments draining to Parramatta River in 2020. These strategic plans integrate green infrastructure (including water sensitive urban design) with public domain plans, park plans of management, and council's civil works planning to minimise impacts to nearby waterways. As a result of the community engagement with these plans, council has allocated an additional $500,000 to increase the number of stormwater quality improvement features, including the raingardens and swales built along the Bay Run and at locations within Leichhardt and Balmain between June 2018 and July 2019. This will improve the quality of stormwater entering the Parramatta River.

In 2018 the Blackmore Oval Constructed Wetland and Stormwater Harvesting project was completed. This wetland takes runoff from the City West Link and the adjoining catchment, filters and allows sediments to settle, before discharging the treated water into Hawthorne Canal and beyond to the Parramatta River. The stormwater harvesting system collects base flow from the canal, which is then treated and used to irrigate Blackmore Oval, significantly reducing the stormwater discharged to the waterway.

Inner West Council currently has 26 GPTs across its local government area and is investigating options to improve the

ongoing maintenance and management of these to ensure their performance. In addition, council is reviewing the design and viability of four new GPTs in locations across the Parramatta River, for construction in future years.

To support and incentivise the community, Inner West Council provides a rainwater tank rebate, and workshops for rainwater harvesting and water sensitive urban design on your property. The workshops include information on reducing potable water use and rainwater, stormwater and greywater re-use.

Parramatta River Catchment Group

Cabarita Beach
Photo: Beachwatch/EES, DPIE

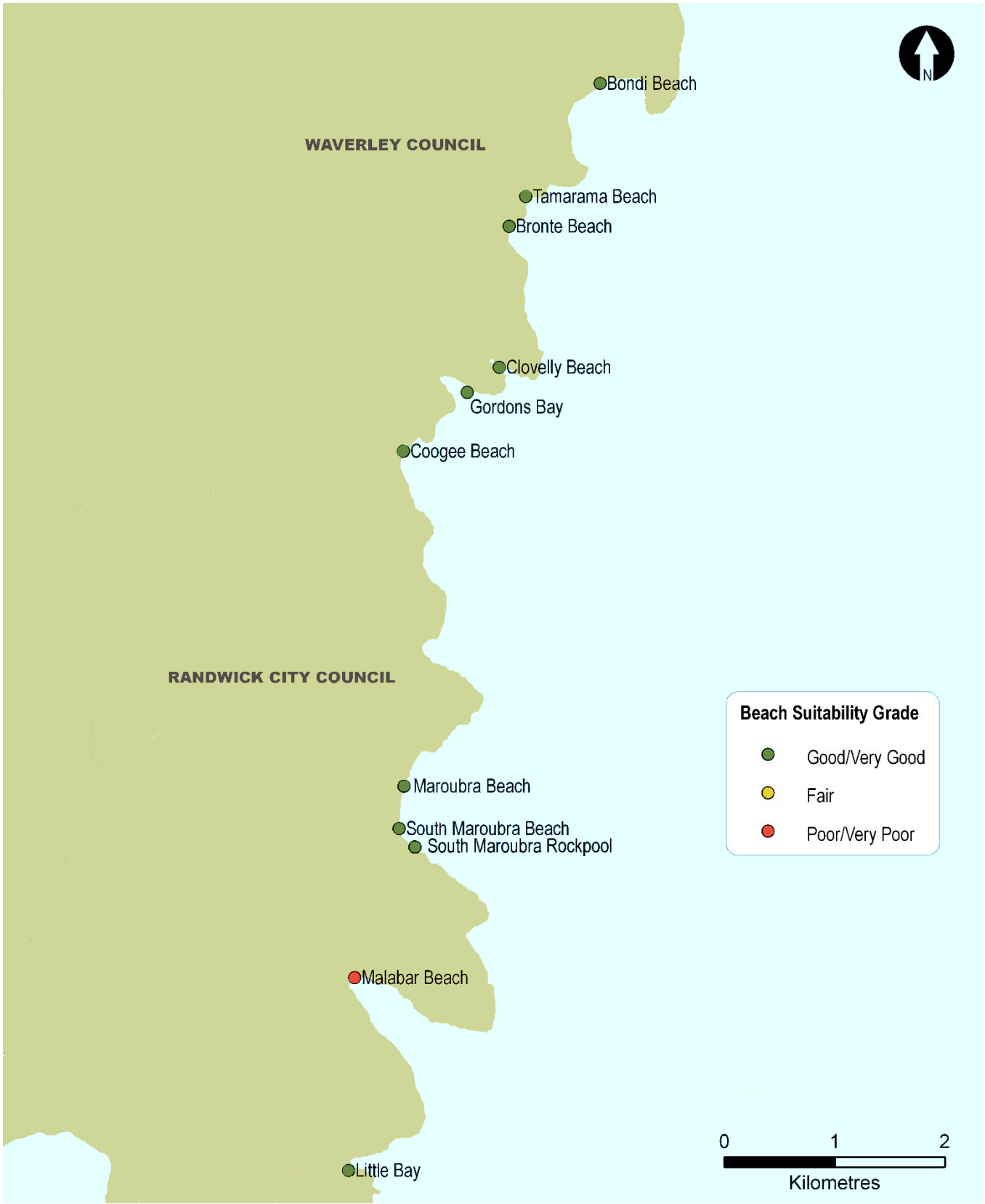
The Parramatta River Catchment Group (PRCG) is comprised of Sydney Water, the NSW Environment Protection Authority, DPIE and local councils including Blacktown City, Burwood, City of Canada Bay, City of Canterbury Bankstown, Cumberland, Hunters Hill, Inner West, City of Parramatta, City of Ryde, Strathfield and The Hills Shire. The group has produced a 10-step masterplan (10 recommendations) for improving the suitability of the river for swimming and its ecosystem health. The plan includes targets to improve waterway outcomes across the catchment, including stormwater and wastewater.

Sydney Water

Sydney Water is the lead coordinating agency driving the delivery of the PRCG's Parramatta River Masterplan. Sydney Water is implementing Step 6 to improve overflows of the masterplan by undertaking a substantial sewer inspection and improvement program across the catchments of upper Parramatta River, Duck Creek and the Lane Cove River. This will reduce the inflow of stormwater to the wastewater system and should lessen the impact of sewage overflows to these waterways.

Sydney Water is progressing a project to reduce the occurrence of wastewater overflows discharging to Rose Bay, Port Jackson. This work is an action from the Rose Bay Beach Working Party and will assist with improving the water quality at Rose Bay Beach.

Sydney Water has inspected, cleaned and repaired sewer mains on the northern and southern side of Port Jackson that have a high likelihood of discharging sewage to waterways if they become blocked. Where significant tree root intrusion to the public sewer from the private sewer was identified, property owners were requested to remedy the problem.



Sampling sites and Beach Suitability Grades at Sydney's central beaches

Sampling sites and Beach Suitability Grades in Sydney Harbour

Bondi Beach

Beach grade: G

See ‘How to read this report’ for key to map.

Bondi Beach is 800 metres long and backed by a promenade, carpark and parklands, and lifeguards patrol the beach year round.

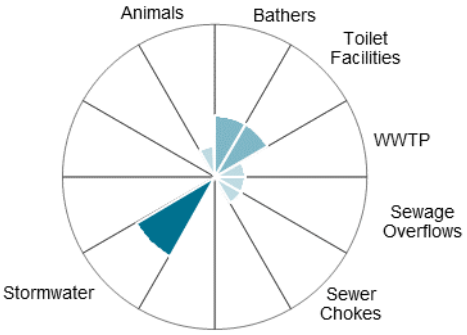
The Beach Suitability Grade of Good indicates microbial water quality is considered suitable for swimming most of the time but may be susceptible to pollution after rain, with several potential sources of faecal contamination including stormwater.

Enterococci levels generally increased with increasing rainfall, occasionally exceeding the safe swimming limit after light rain, and often after 20 mm or more.

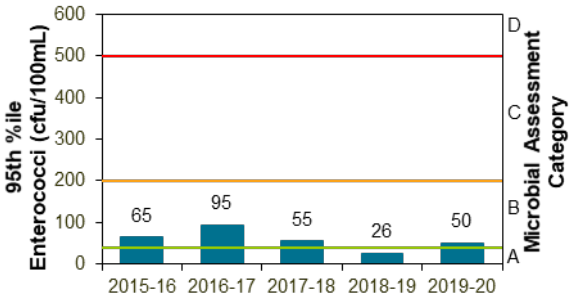
The site has been monitored since 1989.

Site type	Assessment period	Dry weather samples suitable for swimming	Water samples	Beach grade status
Ocean beach	Jun 2018 to Apr 2020	97%	100	Stable

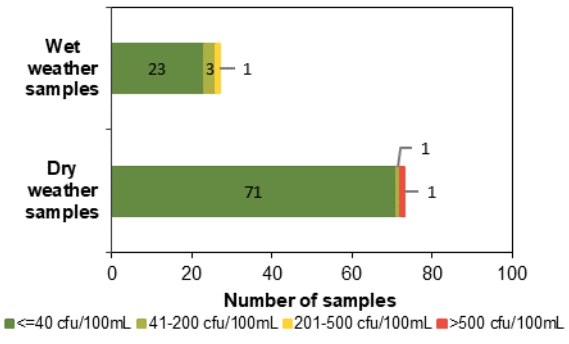
Sanitary inspection: Moderate



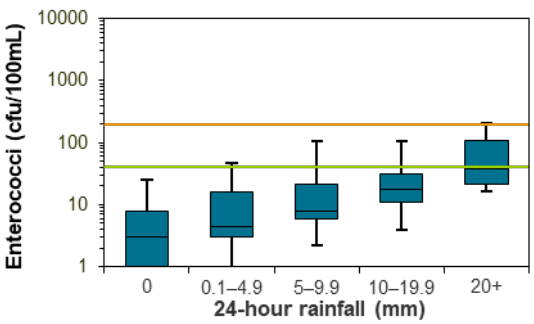
Microbial Assessment Category: B



Dry and wet weather water quality



Water quality in response to rainfall



Tamarama Beach

Beach grade: G

See ‘How to read this report’ for key to map.

Tamarama Beach is approximately 80 metres long and lifeguards patrol the beach from late September to April.

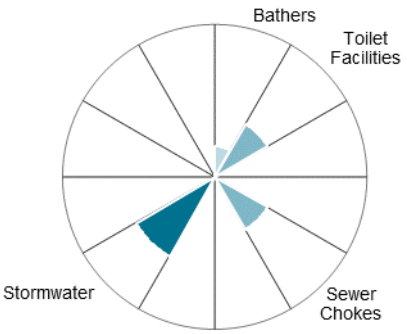
The Beach Suitability Grade of Good indicates microbial water quality is considered suitable for swimming most of the time but may be susceptible to pollution after rain, with several potential sources of faecal contamination including stormwater.

Enterococci levels increased with increasing rainfall, occasionally exceeding the safe swimming limit after light rain, and often in response to 5 mm or more.

The site has been monitored since 1989.

Site type	Assessment period	Dry weather samples suitable for swimming	Water samples	Beach grade status
Ocean beach	Jun 2018 to Apr 2020	96%	100	Stable

Sanitary inspection: Moderate



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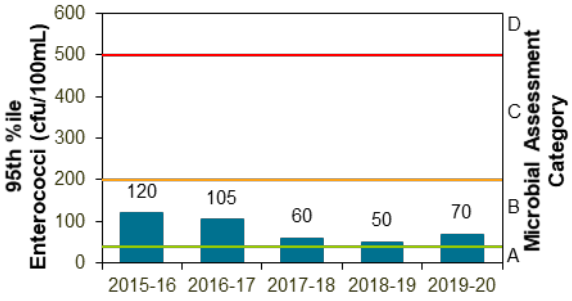
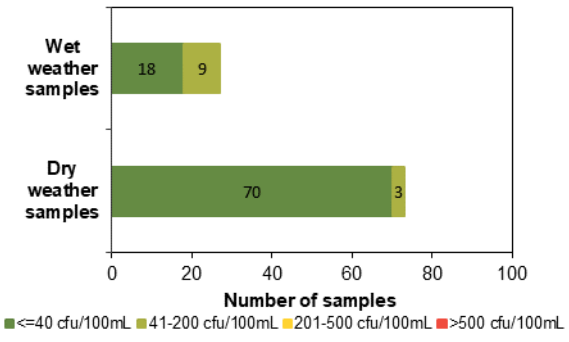
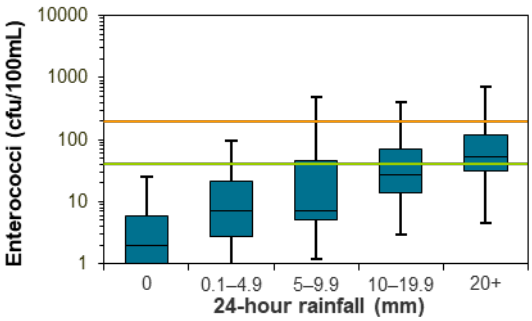


Dry and wet weather water quality



Water quality in response to rainfall



Bronte Beach

Beach grade: G

See ‘How to read this report’ for key to map.

Bronte Beach is 250 metres long and backed by a large park and picnic area. Lifeguards patrol the beach from September to May.

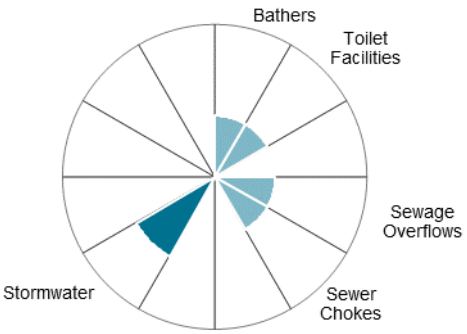
The Beach Suitability Grade of Good indicates microbial water quality is considered suitable for swimming most of the time but may be susceptible to pollution after rain, with several potential sources of faecal contamination including stormwater.

Enterococci levels generally increased with increasing rainfall, occasionally exceeding the safe swimming limit after light rain, and often after 10 mm or more.

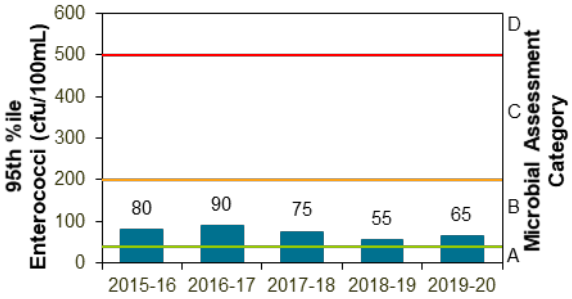
The site has been monitored since 1989.

Site type	Assessment period	Dry weather samples suitable for swimming	Water samples	Beach grade status
Ocean beach	Jun 2018 to Apr 2020	95%	100	Stable

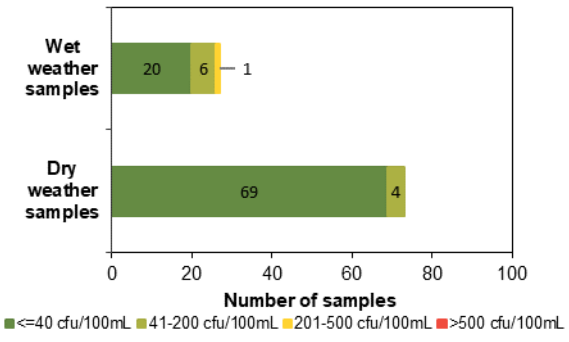
Sanitary inspection: Moderate



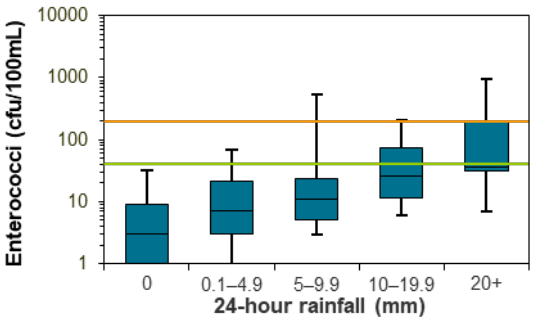
Microbial Assessment Category: B



Dry and wet weather water quality



Water quality in response to rainfall



Clovelly Beach

Beach grade: VG

See ‘How to read this report’ for key to map.

Clovelly Beach is at the end of a long and narrow bay and is protected from ocean swells, and is patrolled from late September to April.

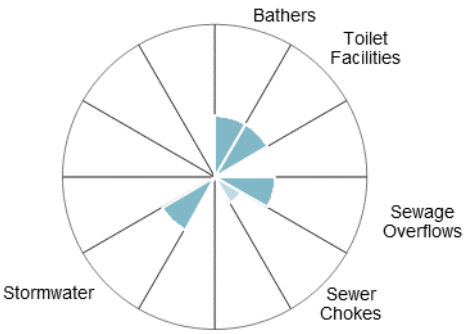
The Beach Suitability Grade of Very Good indicates microbial water quality is considered suitable for swimming almost all of the time, with few potential sources of significant faecal contamination.

Enterococci levels generally increased with increasing rainfall, occasionally exceeding the safe swimming limit after 5 mm or more of rain, and often after 20 mm or more.

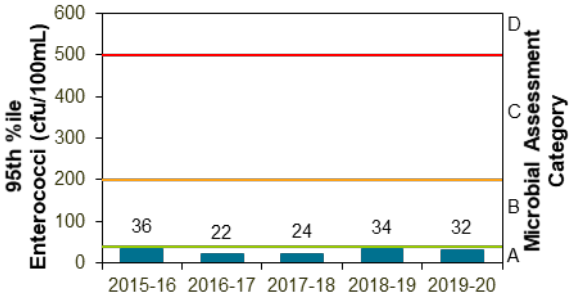
The site has been monitored since 1989.

Site type	Assessment period	Dry weather samples suitable for swimming	Water samples	Beach grade status
Ocean beach	Jun 2018 to Apr 2020	97%	100	Stable

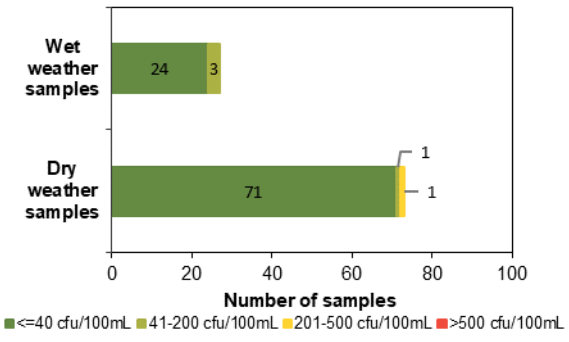
Sanitary inspection: Low



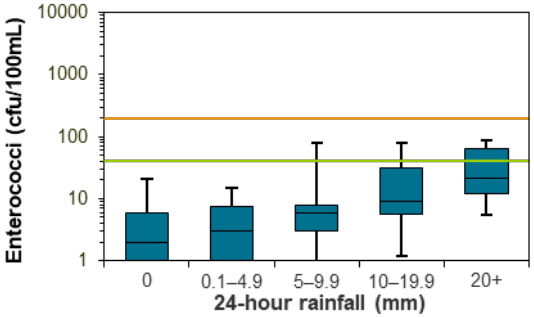
Microbial Assessment Category: A



Dry and wet weather water quality



Water quality in response to rainfall



Gordons Bay

Beach grade: G

See ‘How to read this report’ for key to map.

Gordons Bay is long and narrow with a small beach located at the end of the bay and is not patrolled by lifeguards.

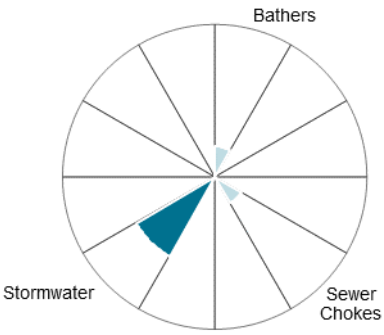
The Beach Suitability Grade of Good indicates microbial water quality is considered suitable for swimming most of the time but may be susceptible to pollution after rain, with potential faecal contamination from stormwater.

Enterococci levels generally increased with increasing rainfall, occasionally exceeding the safe swimming limit after light rain, and often after 20 mm or more.

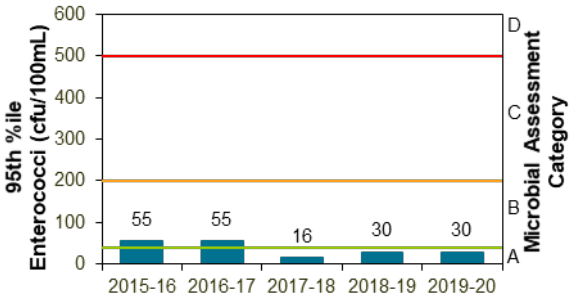
The site has been monitored since 2013.

Site type	Assessment period	Dry weather samples suitable for swimming	Water samples	Beach grade status
Ocean beach	Jun 2018 to Apr 2020	97%	100	Stable

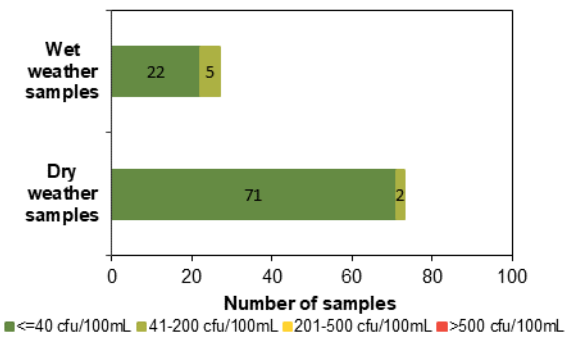
Sanitary inspection: Moderate



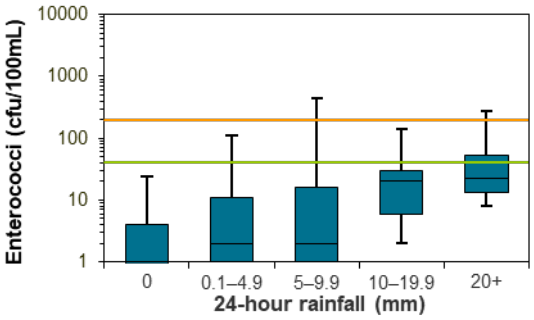
Microbial Assessment Category: A



Dry and wet weather water quality



Water quality in response to rainfall



Coogee Beach

Beach grade: G

See ‘How to read this report’ for key to map.

Coogee Beach is 400 metres long and is backed by a promenade and parklands and is patrolled by lifeguards all year round.

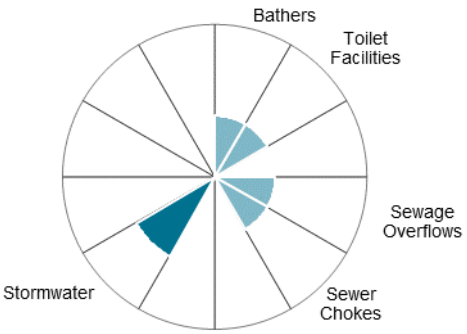
The Beach Suitability Grade of Good indicates microbial water quality is considered suitable for swimming most of the time but may be susceptible to pollution after rain, with several potential sources of faecal contamination including stormwater.

Enterococci levels increased with increasing rainfall, occasionally exceeding the safe swimming limit after no rain, and often after 5 mm or more.

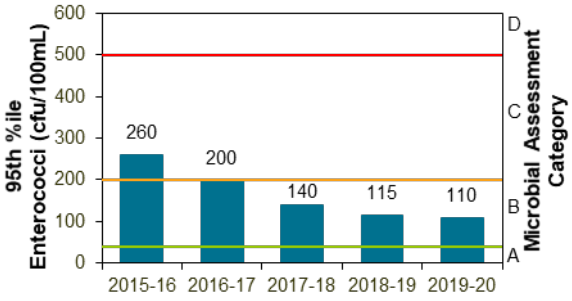
The site has been monitored since 1989.

Site type	Assessment period	Dry weather samples suitable for swimming	Water samples	Beach grade status
Ocean beach	Jun 2018 to Apr 2020	91%	100	Stable

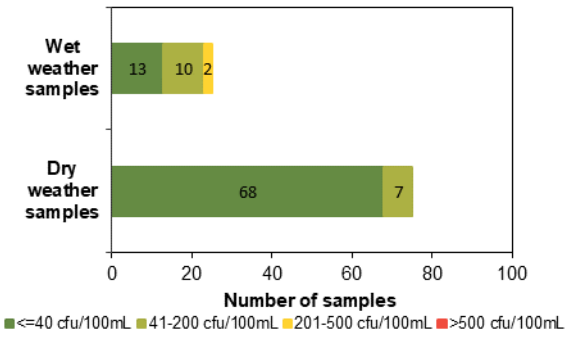
Sanitary inspection: Moderate



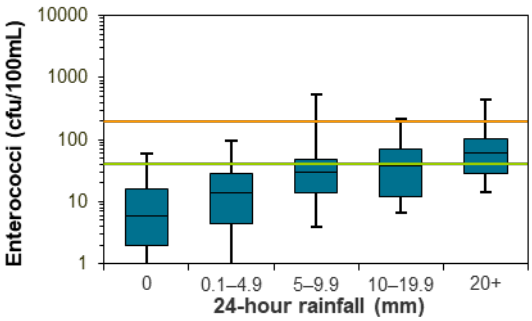
Microbial Assessment Category: B



Dry and wet weather water quality



Water quality in response to rainfall



Maroubra Beach

Beach grade: G

See ‘How to read this report’ for key to map.

Maroubra Beach is one kilometre long and lifeguards patrol the beach all year round.

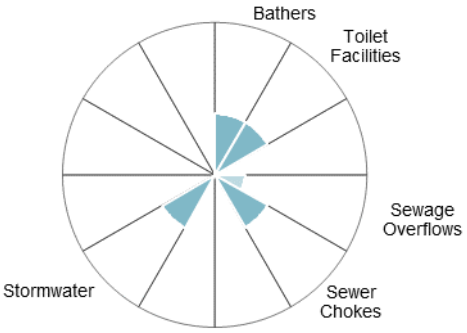
The Beach Suitability Grade of Good indicates microbial water quality is considered suitable for swimming most of the time but can be susceptible to pollution after rain, with several potential sources of minor faecal contamination.

Enterococci levels generally increased with increasing rainfall, occasionally exceeding the safe swimming limit after light rain, and often after 20 mm or more.

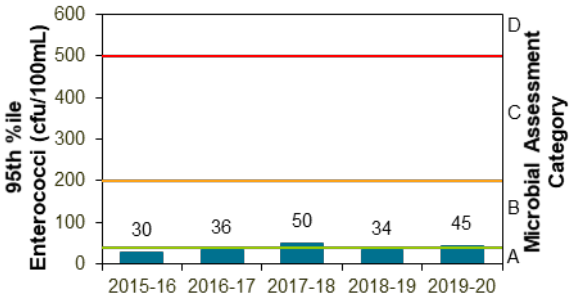
The site has been monitored since 1989.

Site type	Assessment period	Dry weather samples suitable for swimming	Water samples	Beach grade status
Ocean beach	Jun 2018 to Apr 2020	97%	100	Declined

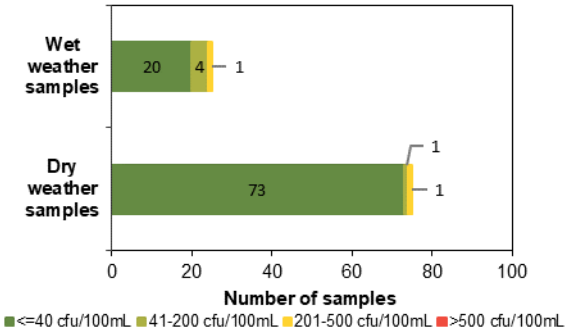
Sanitary inspection: Low



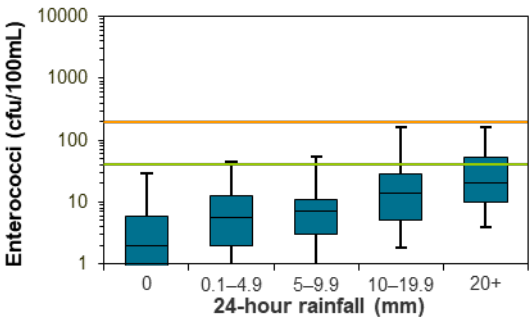
Microbial Assessment Category: B



Dry and wet weather water quality



Water quality in response to rainfall



South Maroubra Beach

Beach grade: G

See 'How to read this report' for key to map.

South Maroubra Beach is located at the southern end of Maroubra Beach and lifeguards patrol the beach all year round.

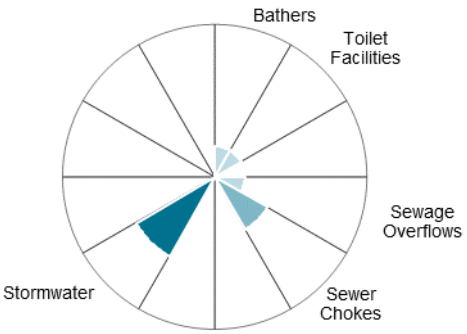
The Beach Suitability Grade of Good indicates microbial water quality is considered suitable for swimming most of the time but may be susceptible to pollution after rain, with several potential sources of faecal contamination including stormwater.

Enterococci levels increased slightly with increasing rainfall, occasionally exceeding the safe swimming limit after rainfall.

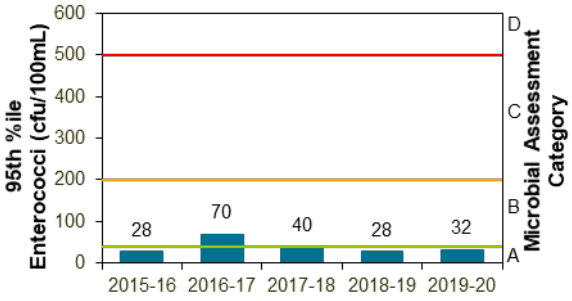
The site has been monitored since 2012.

Site type	Assessment period	Dry weather samples suitable for swimming	Water samples	Beach grade status
Ocean beach	Jun 2018 to Apr 2020	96%	100	Stable

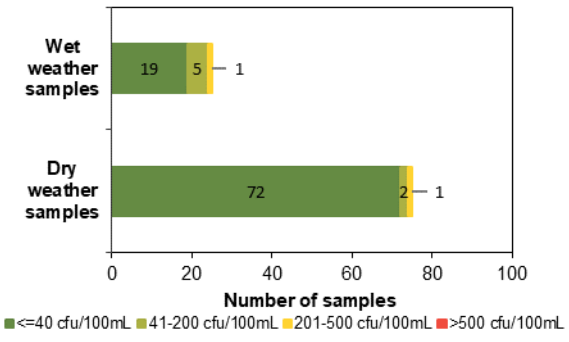
Sanitary inspection: Moderate



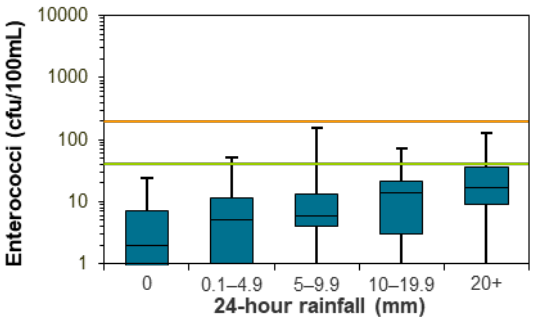
Microbial Assessment Category: A



Dry and wet weather water quality



Water quality in response to rainfall



South Maroubra Rockpool

Beach grade: G

See ‘How to read this report’ for key to map.

South Maroubra Rockpool is located at the southern end of Maroubra Beach and is not patrolled. During very low tides, the rockpool may be empty.

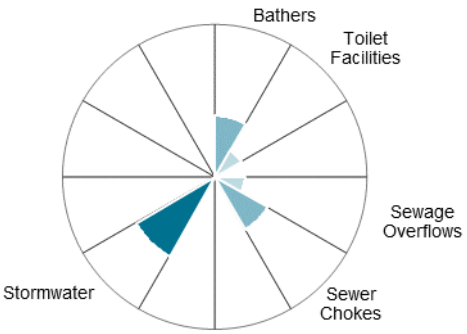
The Beach Suitability Grade of Good indicates microbial water quality is considered suitable for swimming most of the time but may be susceptible to pollution after rain, with several potential sources of faecal contamination including stormwater.

Enterococci levels increased with increasing rainfall, occasionally exceeding the safe swimming limit after little or no rain, and regularly after 10 mm or more.

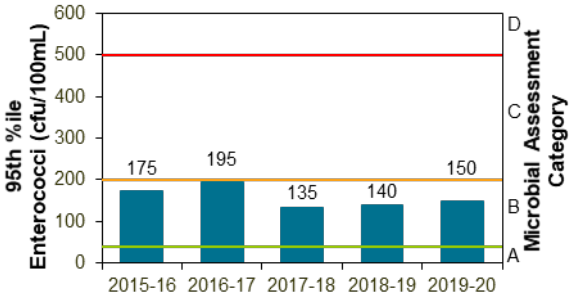
The site has been monitored since 2012.

Site type	Assessment period	Dry weather samples suitable for swimming	Water samples	Beach grade status
Ocean baths	Jun 2018 to Apr 2020	89%	100	Stable

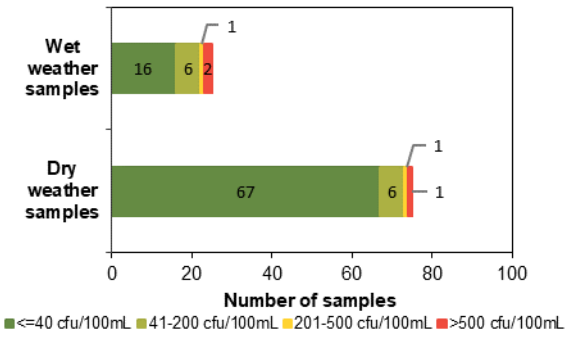
Sanitary inspection: Moderate



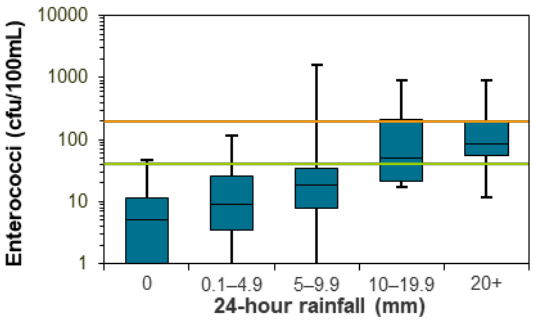
Microbial Assessment Category: B



Dry and wet weather water quality



Water quality in response to rainfall



Malabar Beach

Beach grade: P

See 'How to read this report' for key to map.

Malabar Beach is 150 metres long and located at the end of a long, narrow bay and is not patrolled by lifeguards.

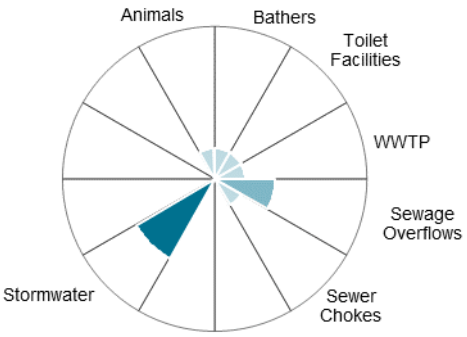
The Beach Suitability Grade of Poor indicates microbial water quality is susceptible to faecal pollution, particularly after rainfall and occasionally during dry weather conditions, with several potential sources of faecal contamination including stormwater.

Enterococci levels increased with increasing rainfall, occasionally exceeding the safe swimming limit after no rain and often after light rainfall.

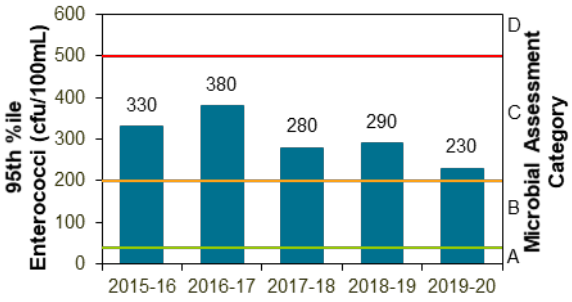
The site has been monitored since 1989.

Site type	Assessment period	Dry weather samples suitable for swimming	Water samples	Beach grade status
Ocean beach	Jun 2018 to Apr 2020	80%	100	Stable

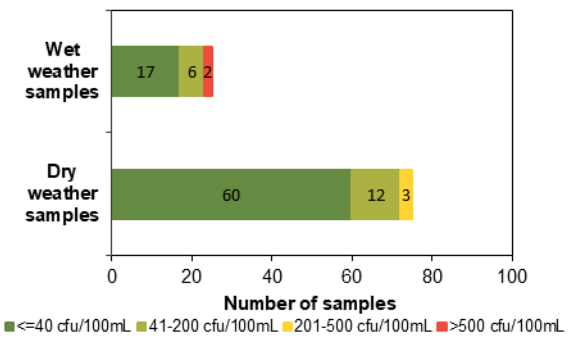
Sanitary inspection: Moderate



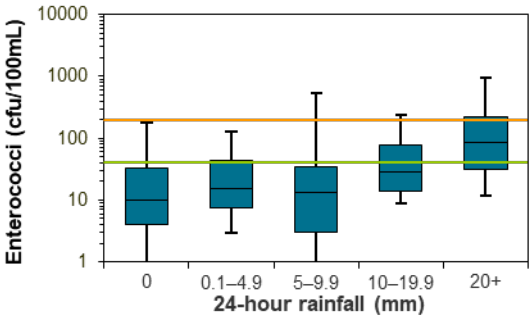
Microbial Assessment Category: C



Dry and wet weather water quality



Water quality in response to rainfall



Little Bay Beach

Beach grade: G

See ‘How to read this report’ for key to map.

Little Bay Beach is a small, crescent-shaped beach bounded by rocky headlands to the north and south and is not patrolled.

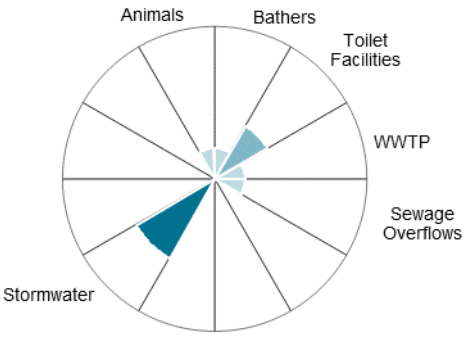
The Beach Suitability Grade of Good indicates microbial water quality is considered suitable for swimming most of the time but can be susceptible to pollution after rain, with several potential sources of faecal contamination including stormwater.

Enterococci levels increased with increasing rainfall, occasionally exceeding the safe swimming limit after little or no rain, and often after 10 mm or more.

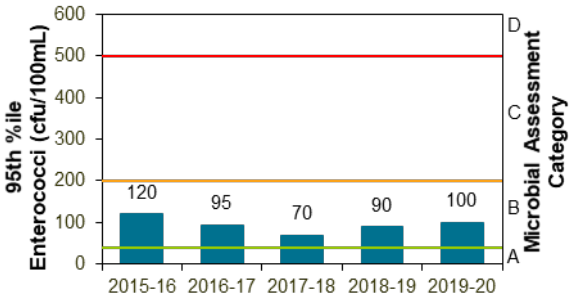
The site was monitored from 1989 until1995, and since 2006.

Site type	Assessment period	Dry weather samples suitable for swimming	Water samples	Beach grade status
Ocean beach	Jun 2018 to Apr 2020	91%	100	Stable

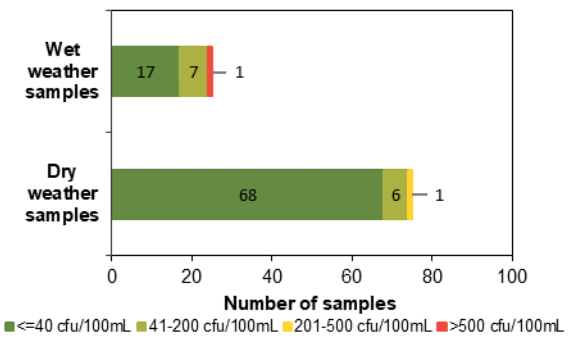
Sanitary inspection: Moderate



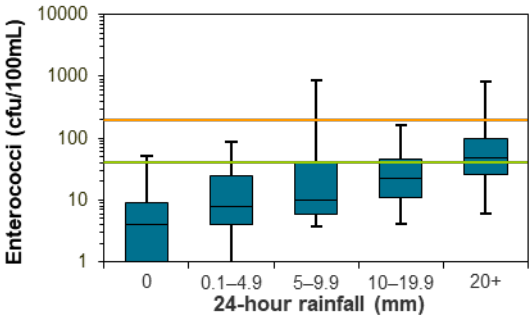
Microbial Assessment Category: B



Dry and wet weather water quality



Water quality in response to rainfall



Camp Cove

Beach grade: VG

See 'How to read this report' for key to map.

The Camp Cove swimming area is not netted and is backed by a narrow stretch of beach. Lifeguards patrol this swimming site during the summer period.

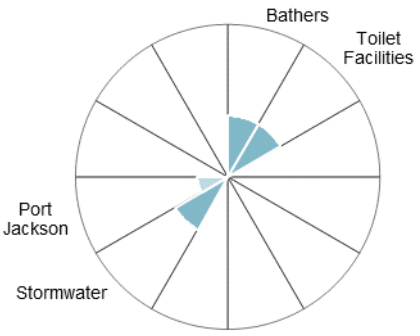
The Beach Suitability Grade of Very Good indicates microbial water quality is considered suitable for swimming almost all of the time, with few potential sources of faecal contamination.

Enterococci levels increased slightly with increasing rainfall, occasionally exceeding the safe swimming limit in response to 5 mm or more of rain.

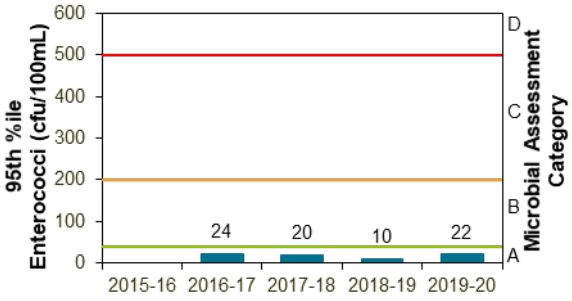
The site was monitored since 2015.

Site type	Assessment period	Dry weather samples suitable for swimming	Water samples	Beach grade status
Estuarine	Oct 2017 to Apr 2020	97%	100	Stable

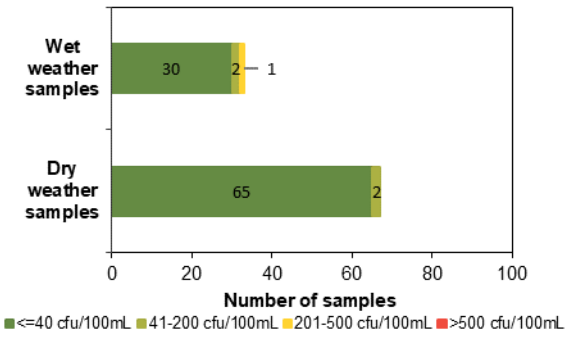
Sanitary inspection: Low



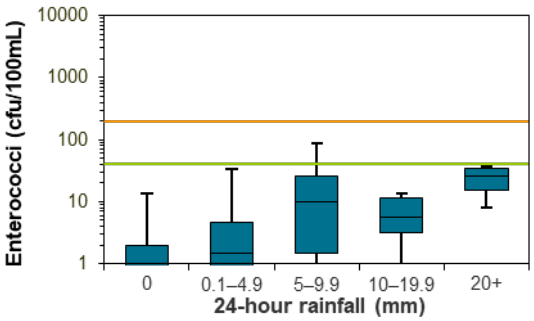
Microbial Assessment Category: A



Dry and wet weather water quality

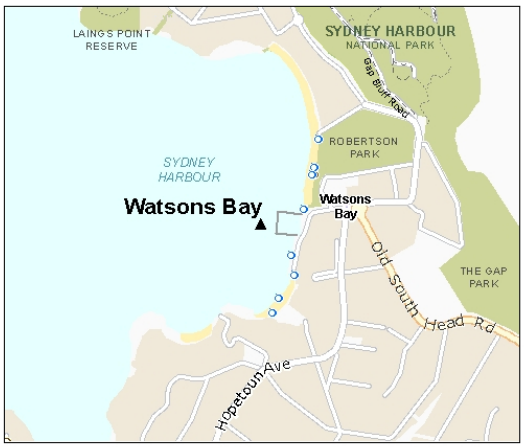


Water quality in response to rainfall



Watsons Bay

Beach grade: G



See 'How to read this report' for key to map.

The swimming site is a 20 by 40 metre enclosed tidal swimming area with a narrow sandy beach and is backed by parklands with picnic facilities.

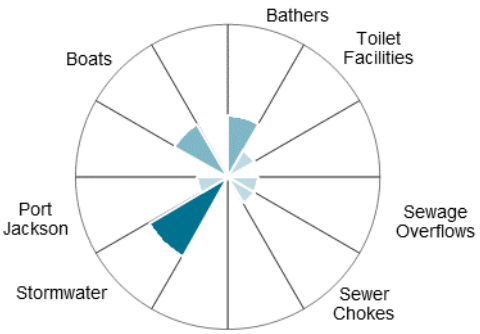
The Beach Suitability Grade of Good indicates microbial water quality is considered suitable for swimming most of the time but can be susceptible to pollution after rain, with several potential sources of faecal contamination including stormwater.

Enterococci levels increased with increasing rainfall, occasionally exceeding the safe swimming limit after light rain, and often after 5 mm or more.

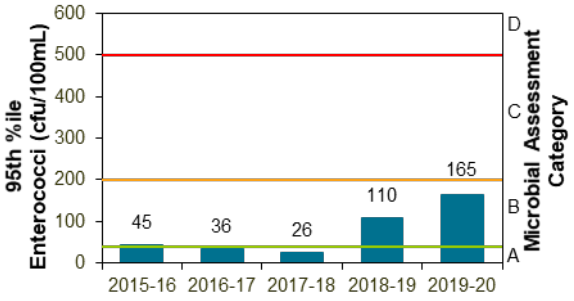
The site has been monitored since 1994.

Site type	Assessment period	Dry weather samples suitable for swimming	Water samples	Beach grade status
Estuarine	Oct 2017 to Apr 2020	97%	100	Stable

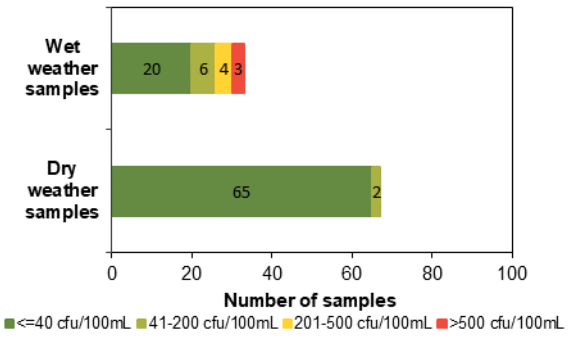
Sanitary inspection: Moderate



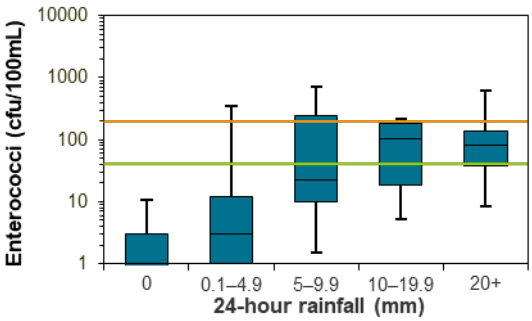
Microbial Assessment Category: B



Dry and wet weather water quality

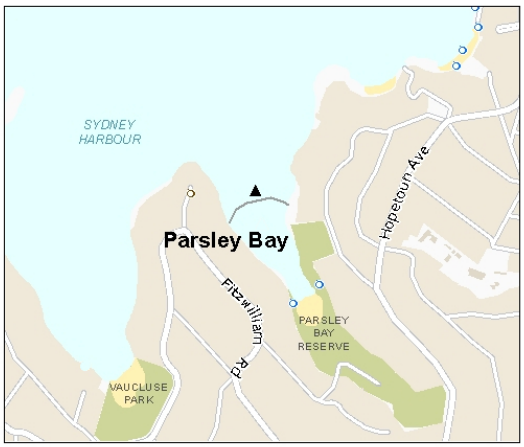


Water quality in response to rainfall



Parsley Bay

Beach grade: G



See 'How to read this report' for key to map.

The swimming site is a netted swimming area backed by a sandy beach and reserve with picnic facilities and a playground.

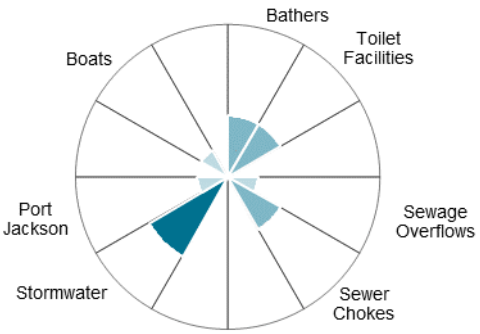
The Beach Suitability Grade of Good indicates microbial water quality is considered suitable for swimming most of the time but may be susceptible to pollution after rain, with several potential sources of faecal contamination including stormwater.

Enterococci levels increased with increasing rainfall, occasionally exceeding the safe swimming limit after light rain and regularly after 5 mm or more.

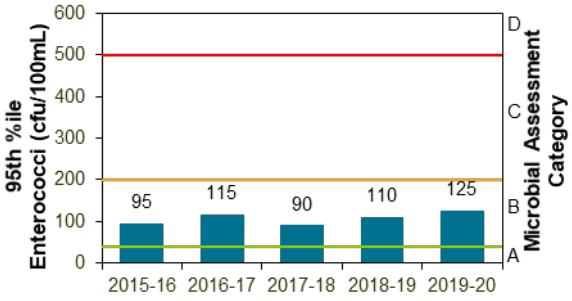
The site has been monitored since 1994.

Site type	Assessment period	Dry weather samples suitable for swimming	Water samples	Beach grade status
Estuarine	Oct 2017 to Apr 2020	96%	100	Stable

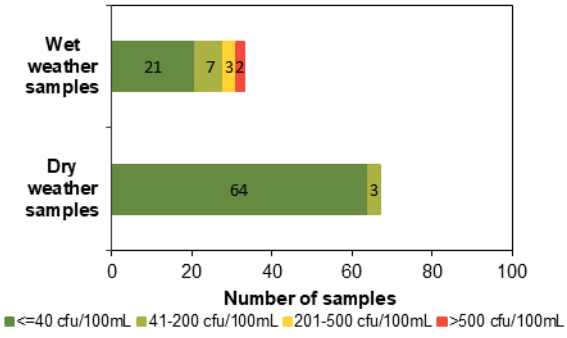
Sanitary inspection: Moderate



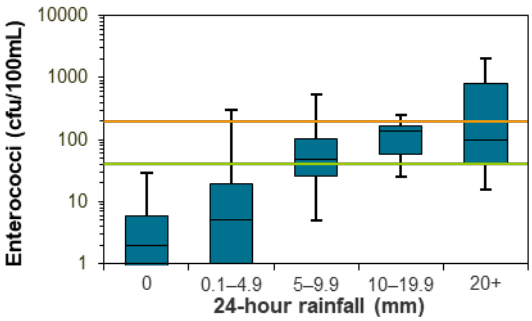
Microbial Assessment Category: B



Dry and wet weather water quality



Water quality in response to rainfall



Nielsen Park

Beach grade: VG

See ‘How to read this report’ for key to map.

Nielsen Park swimming area is approximately 150 metres long and is netted from October to April. It is backed by a sandy beach and Sydney Harbour National Park.

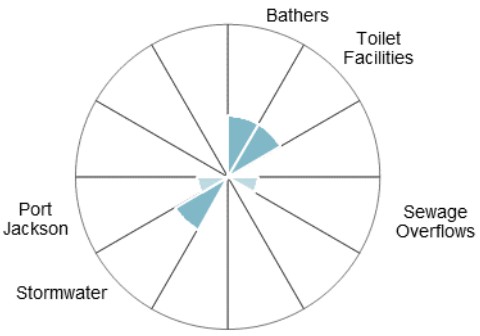
The Beach Suitability Grade of Very Good indicates microbial water quality is considered suitable for swimming almost all of the time, with several potential sources of minor faecal contamination.

Enterococci levels generally increased with increasing rainfall, occasionally exceeding the safe swimming limit after light rain, and often after 5 mm or more.

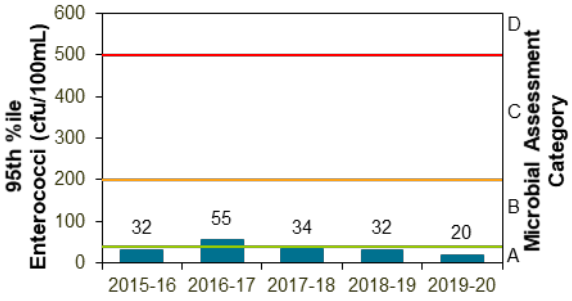
The site has been monitored since 1994.

Site type	Assessment period	Dry weather samples suitable for swimming	Water samples	Beach grade status
Estuarine	Nov 2017 to Apr 2020	98%	100	Stable

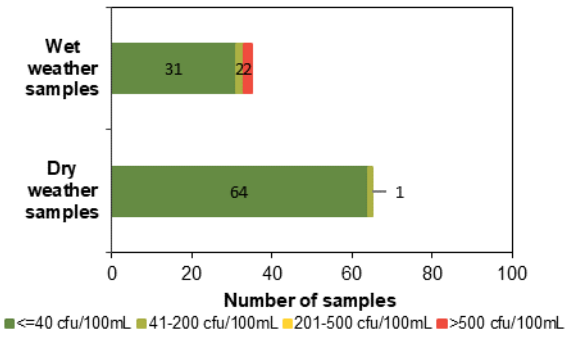
Sanitary inspection: Low



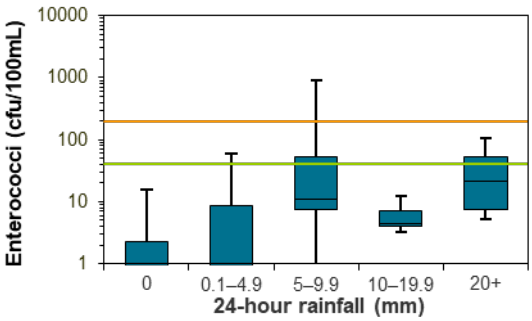
Microbial Assessment Category: A



Dry and wet weather water quality



Water quality in response to rainfall



Rose Bay Beach

Beach grade: P

See ‘How to read this report’ for key to map.

Rose Bay Beach is approximately 500 metres long and the swimming area is not netted.

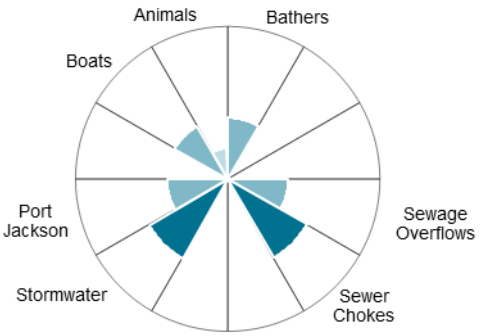
The Beach Suitability Grade of Poor indicates microbial water quality is susceptible to faecal pollution, particularly after rainfall and occasionally during dry weather conditions, with potential faecal contamination from several sources including stormwater and sewer chokes.

Enterococci levels increased with increasing rainfall, occasionally exceeding the safe swimming limit after no rain, and regularly after 5 mm or more.

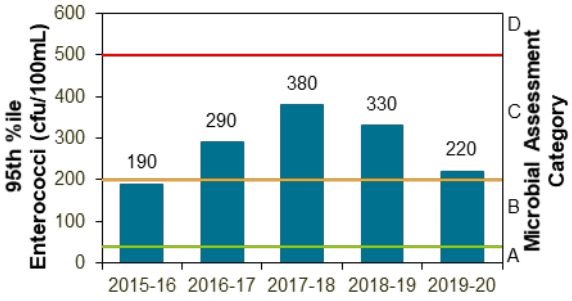
The site has been monitored since 1994.

Site type	Assessment period	Dry weather samples suitable for swimming	Water samples	Beach grade status
Estuarine	Nov 2017 to Apr 2020	91%	100	Stable

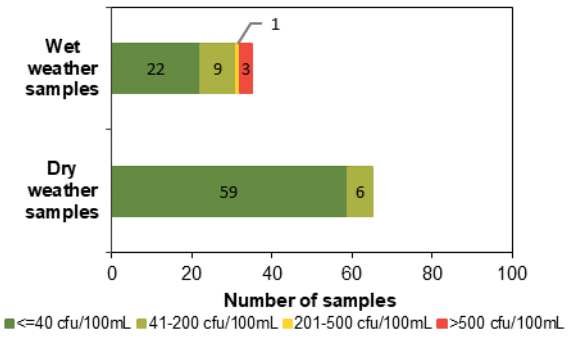
Sanitary inspection: Moderate



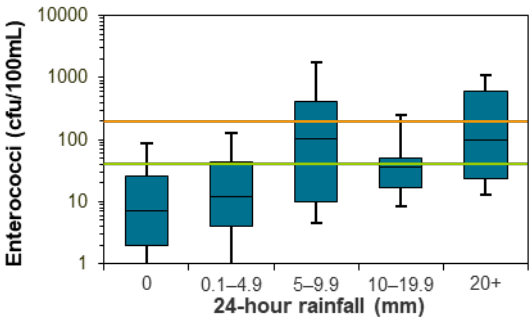
Microbial Assessment Category: C



Dry and wet weather water quality

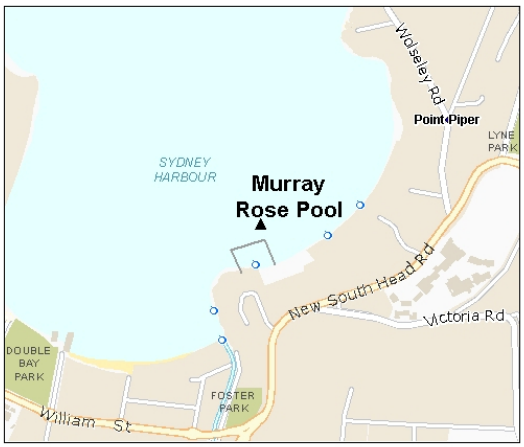


Water quality in response to rainfall



Murray Rose Pool

Beach grade: G



See 'How to read this report' for key to map.

Murray Rose Pool (formerly Redleaf Pool) is a netted swimming enclosure in Double Bay, at the end of Seven Shillings Beach.

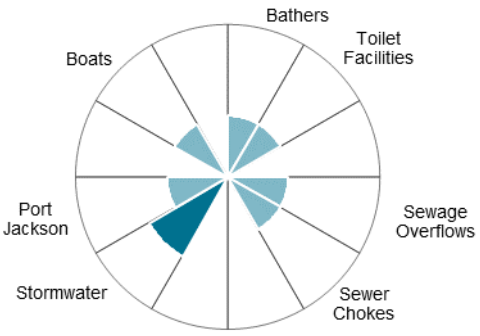
The Beach Suitability Grade of Good indicates microbial water quality is considered suitable for swimming most of the time but may be susceptible to pollution after rain, with several potential sources of faecal contamination including stormwater.

Enterococci levels increased with increasing rainfall, occasionally exceeding the safe swimming limit after light rain, and regularly after 5 mm or more.

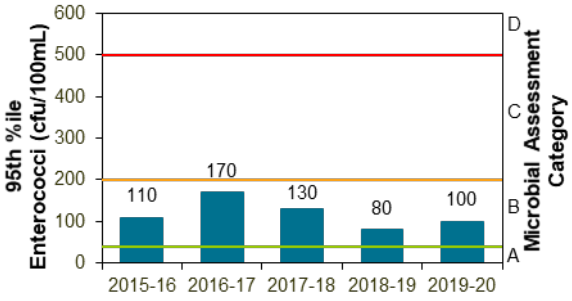
The site has been monitored since 1994.

Site type	Assessment period	Dry weather samples suitable for swimming	Water samples	Beach grade status
Estuarine	Oct 2017 to Apr 2020	96%	100	Stable

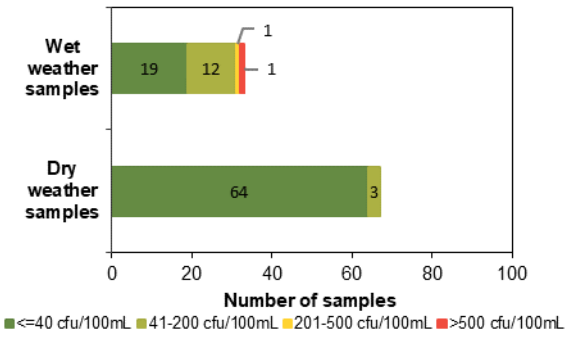
Sanitary inspection: Moderate



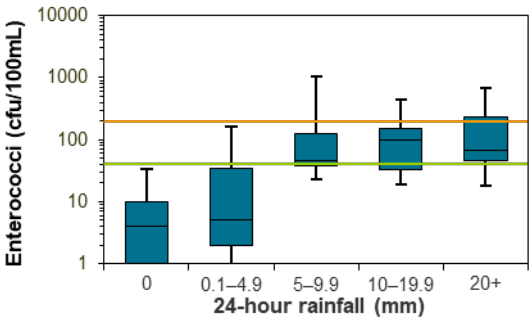
Microbial Assessment Category: B



Dry and wet weather water quality



Water quality in response to rainfall



Dawn Fraser Pool

Beach grade: G

See ‘How to read this report’ for key to map.

Dawn Fraser Pool is an enclosed swimming area located in the Parramatta River and is open between October and April each year.

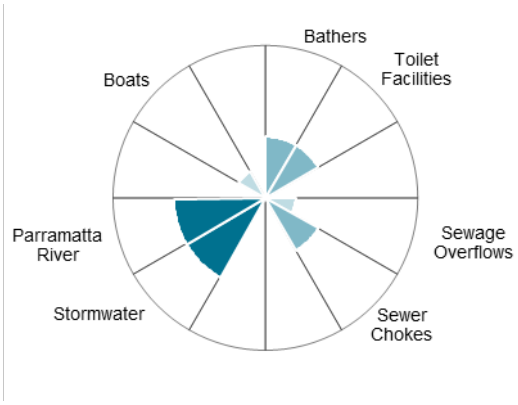
The Beach Suitability Grade of Good indicates microbial water quality is considered suitable for swimming most of the time but may be susceptible to pollution after rain, with several potential sources of faecal contamination including upstream sources in the Parramatta River.

Enterococci levels increased with increasing rainfall, occasionally exceeding the safe swimming limit after light rain and regularly after 5 mm or more.

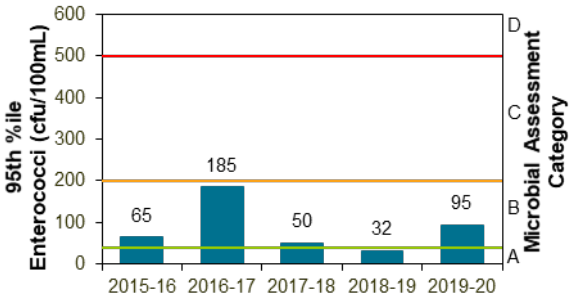
The site has been monitored since 1994.

Site type	Assessment period	Dry weather samples suitable for swimming	Water samples	Beach grade status
Estuarine	Oct 2017 to Apr 2020	97%	100	Stable

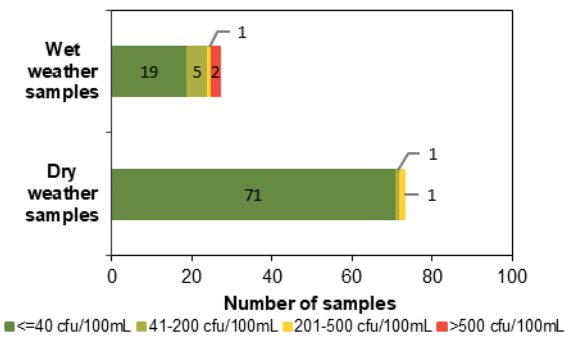
Sanitary inspection: Moderate



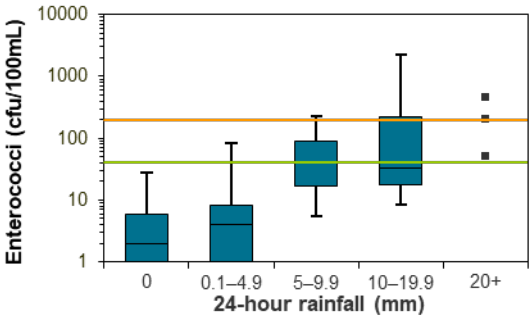
Microbial Assessment Category: B



Dry and wet weather water quality



Water quality in response to rainfall



Chiswick Baths

Beach grade: G

See ‘How to read this report’ for key to map.

Chiswick Baths is a netted swimming enclosure in Five Dock Bay and is backed by a narrow sandy beach and a park.

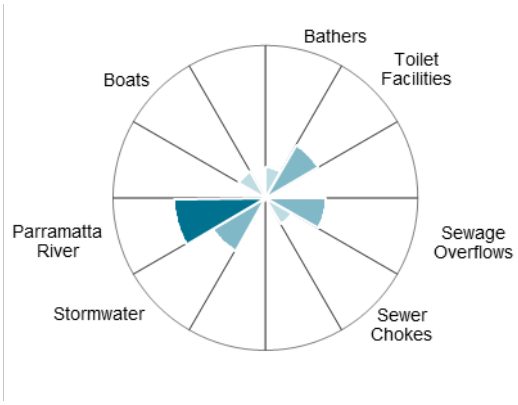
The Beach Suitability Grade of Good indicates microbial water quality is considered suitable for swimming most of the time but can be susceptible to pollution after rain, with several potential sources of faecal contamination including upstream sources in the Parramatta River.

Enterococci levels increased with increasing rainfall, occasionally exceeding the safe swimming limit after no rain, and regularly after 10 mm or more.

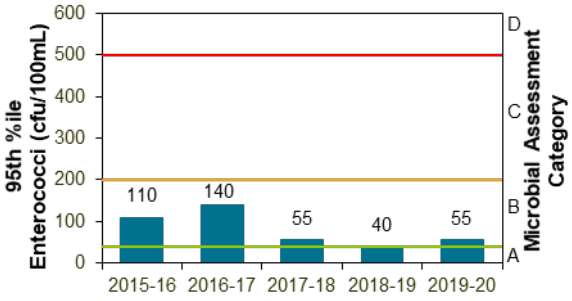
The site has been monitored since 1999.

Site type	Assessment period	Dry weather samples suitable for swimming	Water samples	Beach grade status
Estuarine	Oct 2017 to Apr 2020	97%	100	Stable

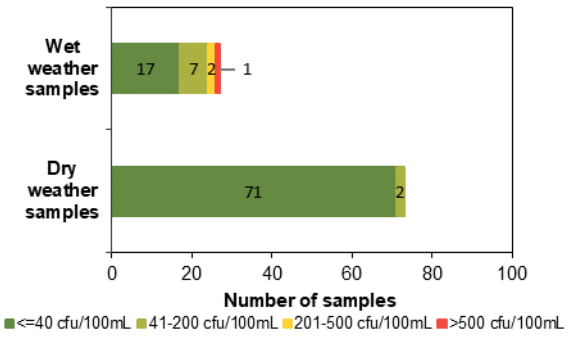
Sanitary inspection: Moderate



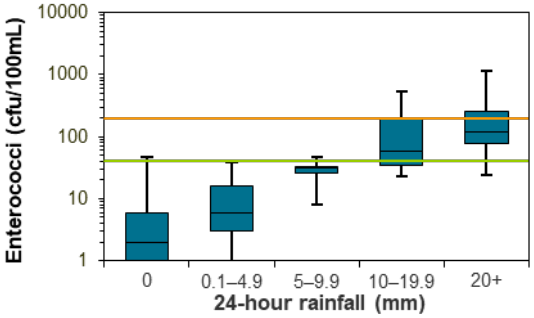
Microbial Assessment Category: B



Dry and wet weather water quality



Water quality in response to rainfall



Cabarita Beach

Beach grade: G

See ‘How to read this report’ for key to map.

Cabarita Beach is a 120 metre long sandy beach and is backed by parklands.

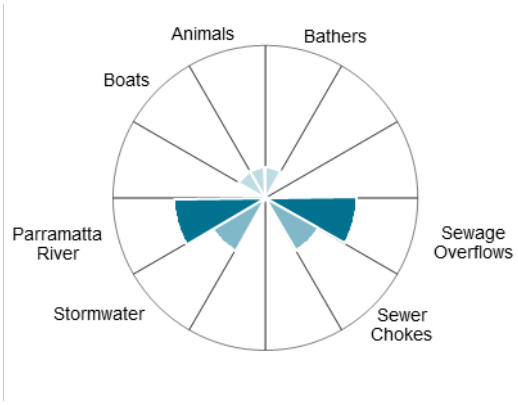
The Beach Suitability Grade of Good indicates microbial water quality is considered suitable for swimming most of the time but can be susceptible to pollution after rain, with potential faecal contamination from sewage overflows and upstream sources in the Parramatta River.

Enterococci levels increased with increasing rainfall, occasionally exceeding the safe swimming limit in response to light rain, and often after 10 mm or more.

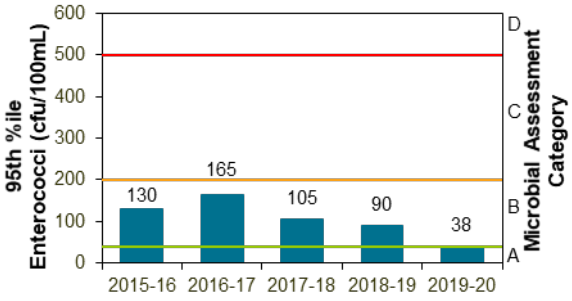
The site has been monitored since 1996.

Site type	Assessment period	Dry weather samples suitable for swimming	Water samples	Beach grade status
Estuarine	Oct 2017 to Apr 2020	97%	100	Stable

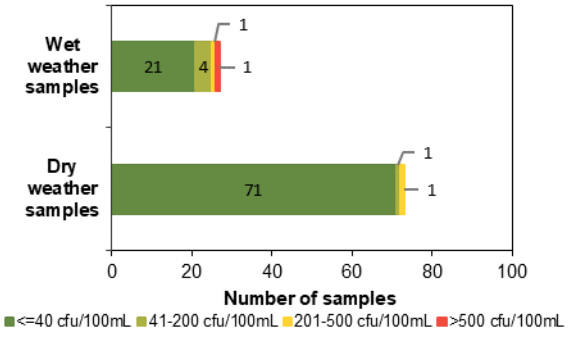
Sanitary inspection: Moderate



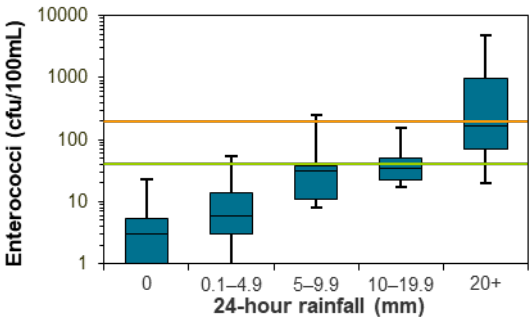
Microbial Assessment Category: A



Dry and wet weather water quality



Water quality in response to rainfall



Woolwich Baths

Beach grade: G

See ‘How to read this report’ for key to map.

Woolwich Baths is a 20 by 30 metre netted swimming area in the lower Lane Cove River with a narrow sandy beach.

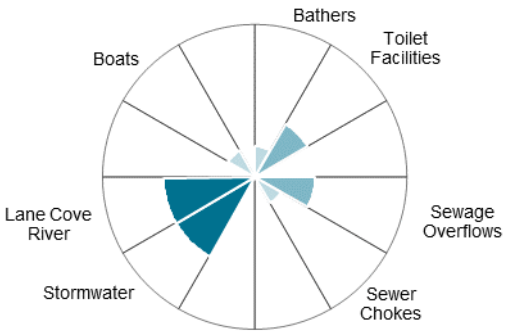
The Beach Suitability Grade of Good indicates microbial water quality is considered suitable for swimming most of the time but can be susceptible to pollution after rain, with potential faecal contamination from stormwater and discharge from the Lane Cove River.

Enterococci levels increased with increasing rainfall, occasionally exceeding the safe swimming limit after little or no rain, and often after 5 mm or more.

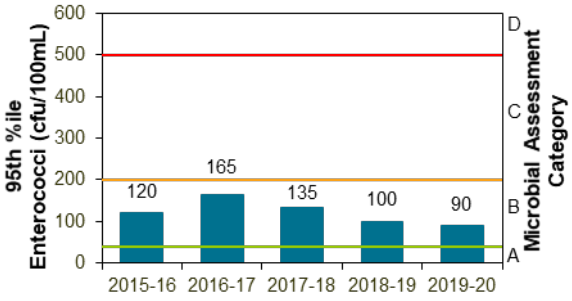
The site has been monitored since 1994.

Site type	Assessment period	Dry weather samples suitable for swimming	Water samples	Beach grade status
Estuarine	Oct 2017 to Apr 2020	96%	100	Stable

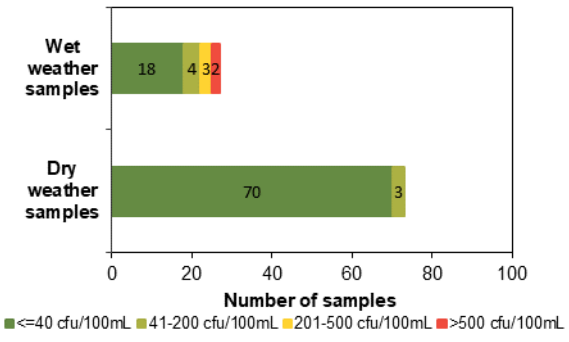
Sanitary inspection: Moderate



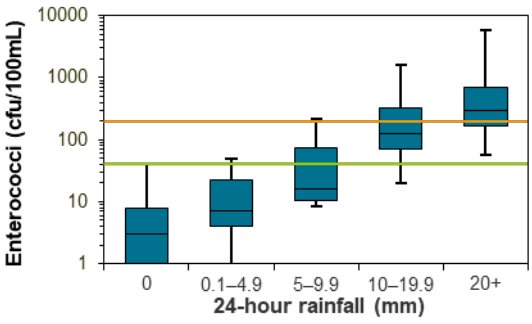
Microbial Assessment Category: B



Dry and wet weather water quality

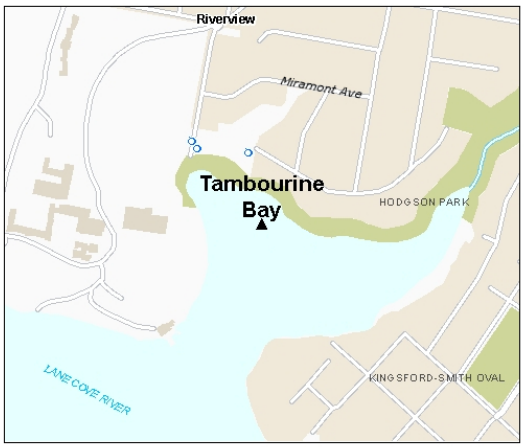


Water quality in response to rainfall



Tambourine Bay

Beach grade: G



See ‘How to read this report’ for key to map.

Tambourine Bay is in the lower Lane Cove River. The swimming enclosure has been removed and access to the water is limited.

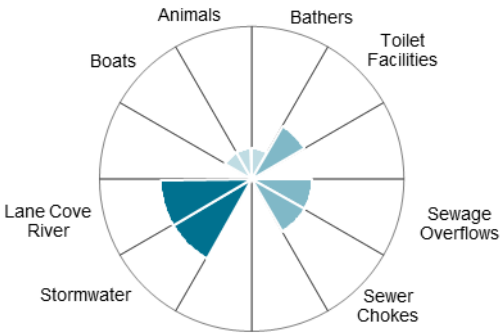
The Beach Suitability Grade of Good indicates microbial water quality is considered suitable for swimming most of the time but may be susceptible to pollution after rain, with potential faecal contamination from stormwater and discharge from the Lane Cove River.

Enterococci levels increased with increasing rainfall, occasionally exceeding the safe swimming limit after little or no rain, and frequently after 5 mm or more.

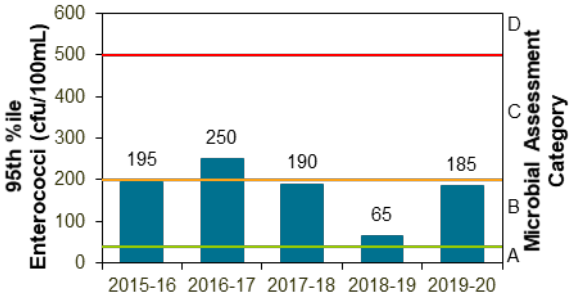
The site has been monitored since 1994.

Site type	Assessment period	Dry weather samples suitable for swimming	Water samples	Beach grade status
Estuarine	Oct 2017 to Apr 2020	96%	100	Stable

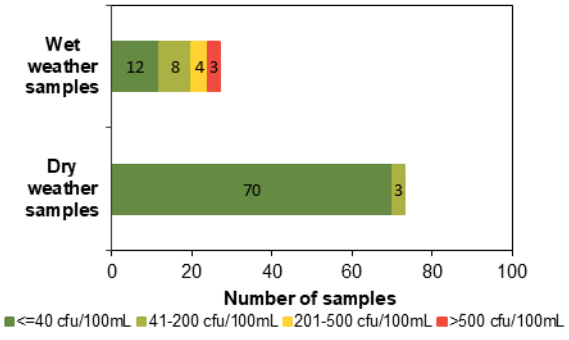
Sanitary inspection: Moderate



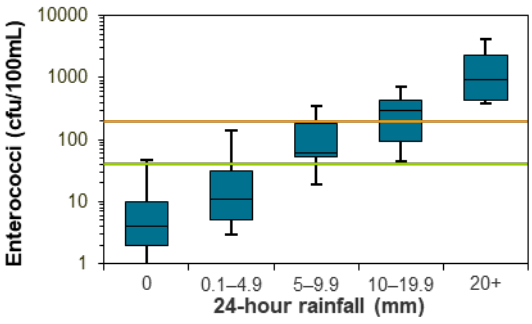
Microbial Assessment Category: B



Dry and wet weather water quality



Water quality in response to rainfall



Woodford Bay

Beach grade: G

See ‘How to read this report’ for key to map.

This site is a 20 by 25 metre swimming enclosure on the western side of Woodford Bay in the lower Lane Cove River.

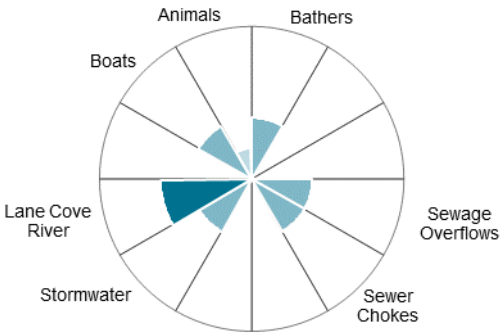
The Beach Suitability Grade of Good indicates microbial water quality is considered suitable for swimming most of the time but may be susceptible to pollution after rain, with several potential sources of faecal contamination including discharge from Lane Cove River.

Enterococci levels increased with increasing rainfall, occasionally exceeding the safe swimming limit after little or no rain, and often after 5 mm or more.

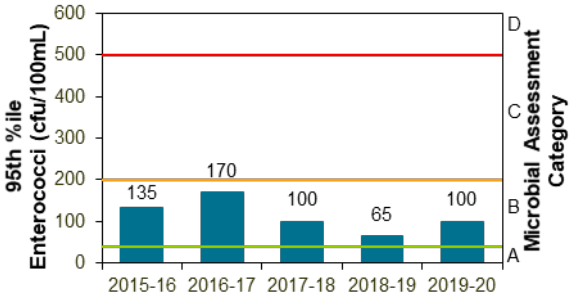
The site has been monitored since 1994.

Site type	Assessment period	Dry weather samples suitable for swimming	Water samples	Beach grade status
Estuarine	Oct 2017 to Apr 2020	95%	100	Stable

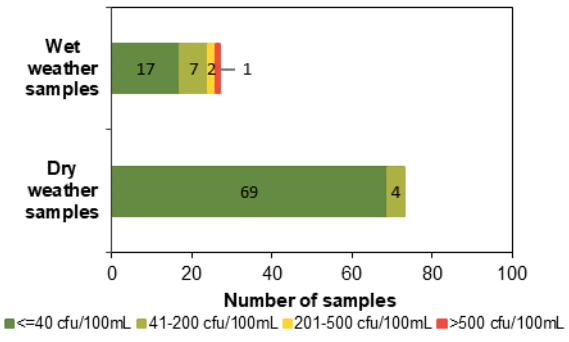
Sanitary inspection: Moderate



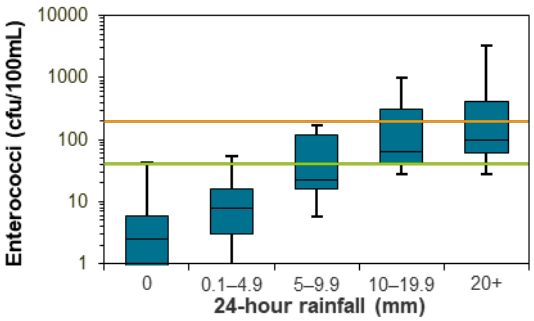
Microbial Assessment Category: B



Dry and wet weather water quality



Water quality in response to rainfall



Greenwich Baths

Beach grade: G

See ‘How to read this report’ for key to map.

Greenwich Baths is a 40 metre long netted swimming area backed by a sandy beach and is open during the swimming season.

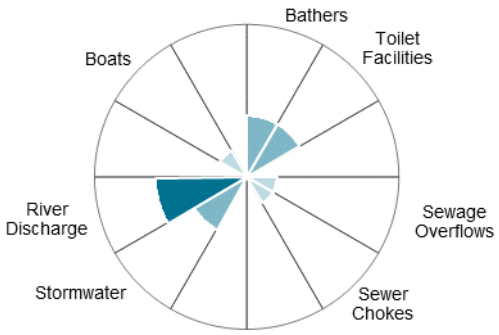
The Beach Suitability Grade of Good indicates microbial water quality is considered suitable for swimming most of the time but may be susceptible to pollution after rain, with several potential sources of faecal contamination including discharge from Lane Cove River.

Enterococci levels increased with increasing rainfall, occasionally exceeding the safe swimming limit after little or no rain, and often after 5 mm or more.

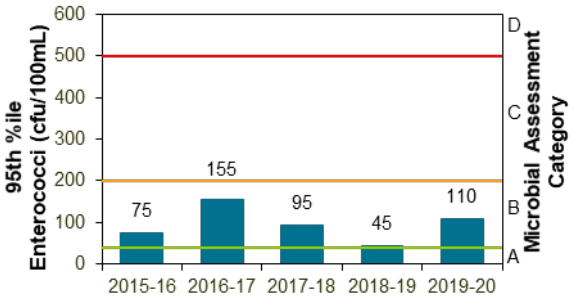
The site has been monitored since 1994.

Site type	Assessment period	Dry weather samples suitable for swimming	Water samples	Beach grade status
Estuarine	Oct 2017 to Apr 2020	93%	100	Stable

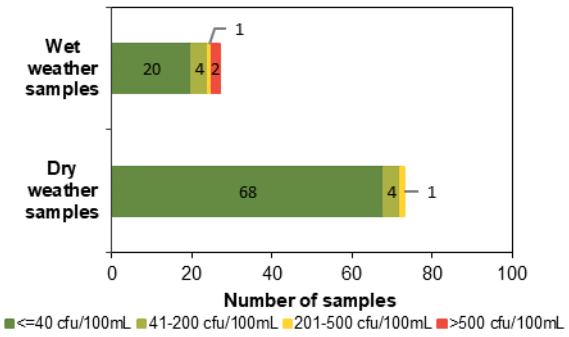
Sanitary inspection: Moderate



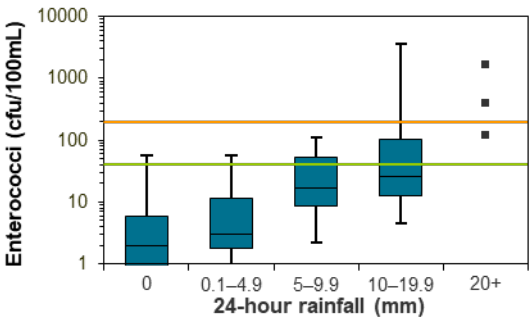
Microbial Assessment Category: B



Dry and wet weather water quality



Water quality in response to rainfall



Hayes Street Beach

Beach grade: P

Hayes Street Beach is approximately 50 metres long and is located adjacent to the Hayes Street Ferry Wharf in Neutral Bay and is not netted.

The Beach Suitability Grade of Poor indicates microbial water quality is susceptible to faecal pollution, particularly after rainfall and occasionally during dry weather conditions, with potential faecal contamination including stormwater.

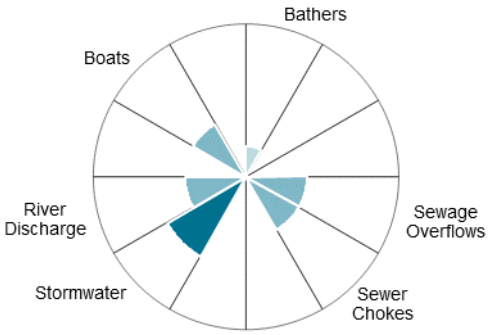
Enterococci levels increased with increasing rainfall, occasionally exceeding the safe swimming limit after no rain, and regularly after 5 mm or more.

See ‘How to read this report’ for key to map.

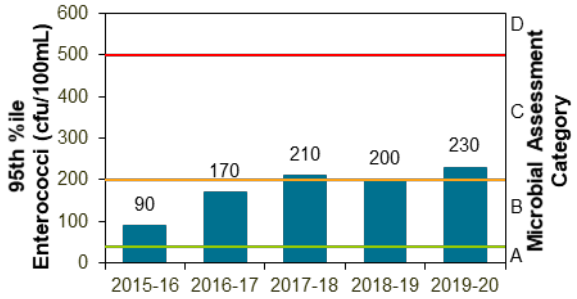
The site has been monitored since 1994.

Site type	Assessment period	Dry weather samples suitable for swimming	Water samples	Beach grade status
Estuarine	Oct 2017 to Apr 2020	96%	100	Declined

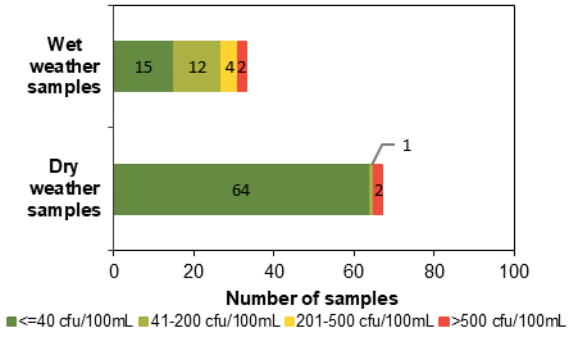
Sanitary inspection: Moderate



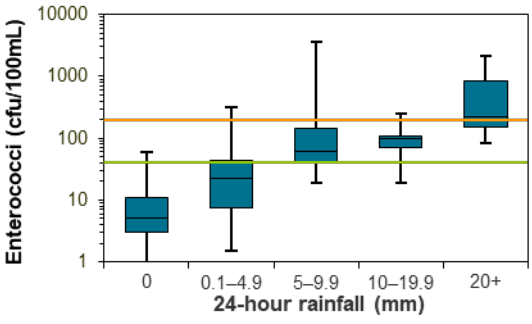
Microbial Assessment Category: C



Dry and wet weather water quality



Water quality in response to rainfall



Clifton Gardens

Beach grade: G

See ‘How to read this report’ for key to map.

Clifton Gardens is a large netted swimming area at the western end of a 250 metre long beach in Chowder Bay and is backed by Sydney Harbour National Park and a park.

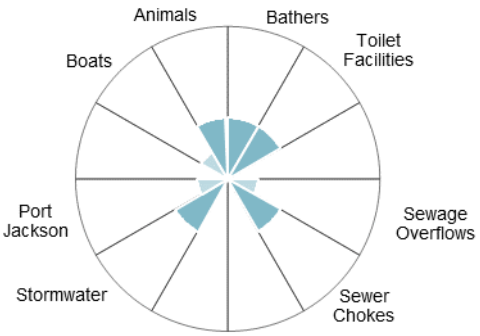
The Beach Suitability Grade of Good indicates microbial water quality is considered suitable for swimming most of the time but may be susceptible to pollution after rain, with several potential sources of minor faecal contamination.

Enterococci levels increased with increasing rainfall, occasionally exceeding the safe swimming limit after light rain, and regularly after 20 mm or more.

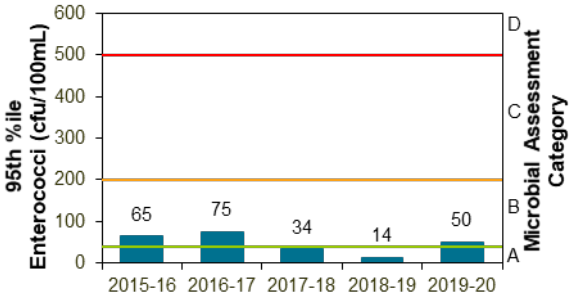
The site has been monitored since 1994.

Site type	Assessment period	Dry weather samples suitable for swimming	Water samples	Beach grade status
Estuarine	Oct 2017 to Apr 2020	99%	100	Stable

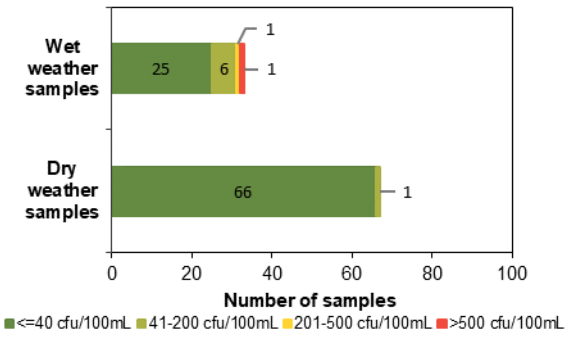
Sanitary inspection: Moderate



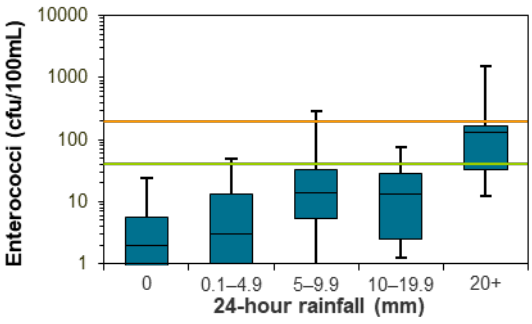
Microbial Assessment Category: B



Dry and wet weather water quality

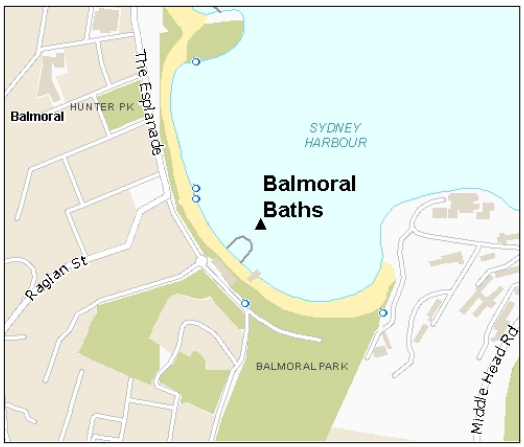


Water quality in response to rainfall



Balmoral Baths

Beach grade: G



See ‘How to read this report’ for key to map.

Balmoral Baths is a netted swimming area at the eastern end of Balmoral Beach and is backed by a park.

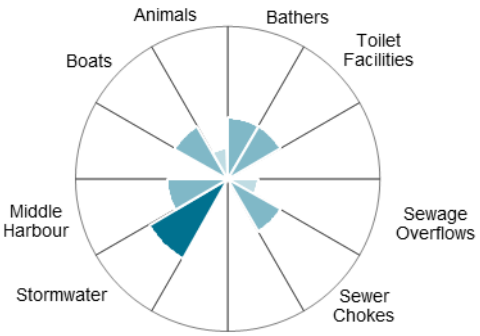
The Beach Suitability Grade of Good indicates microbial water quality is considered suitable for swimming most of the time but may be susceptible to pollution after rain, with several potential sources of faecal contamination including stormwater.

Enterococci levels increased with increasing rainfall, occasionally exceeding the safe swimming limit after light rain and often after 5 mm or more.

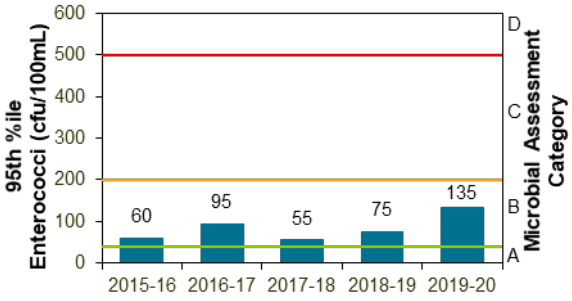
The site has been monitored since 1994.

Site type	Assessment period	Dry weather samples suitable for swimming	Water samples	Beach grade status
Estuarine	Oct 2017 to Apr 2020	97%	100	Stable

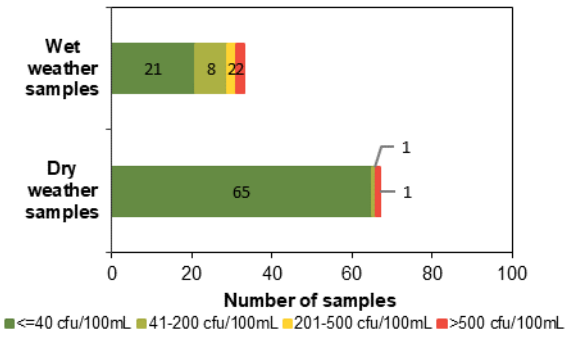
Sanitary inspection: Moderate



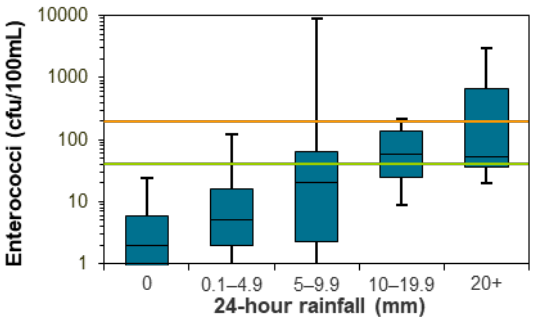
Microbial Assessment Category: B



Dry and wet weather water quality

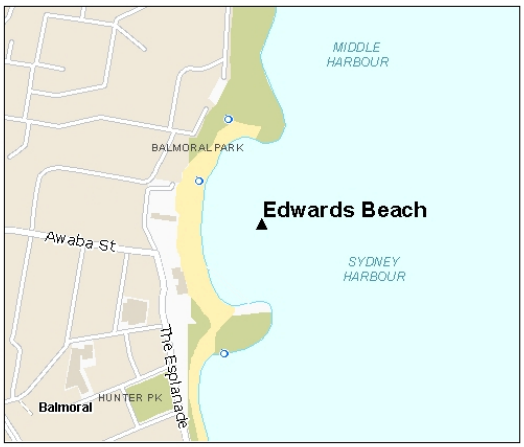


Water quality in response to rainfall



Edwards Beach

Beach grade: G



See ‘How to read this report’ for key to map.

Edwards Beach is a popular swimming area backed by a walking track, park and café facilities.

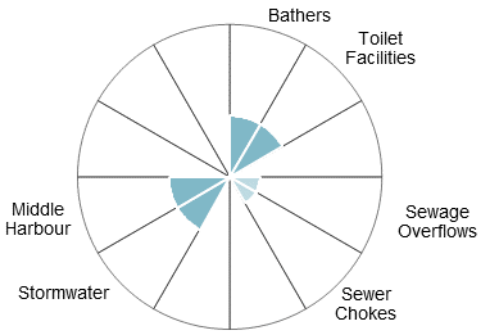
The Beach Suitability Grade of Good indicates microbial water quality is considered suitable for swimming most of the time but may be susceptible to pollution after rain, with several potential sources of minor faecal contamination.

Enterococci levels increased slightly with increasing rainfall, occasionally exceeding the safe swimming limit after light rain, and often after 10 mm or more.

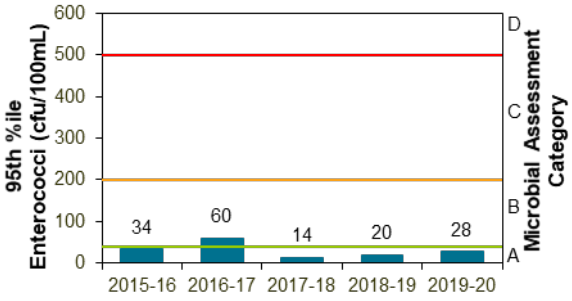
The site has been monitored since 1994.

Site type	Assessment period	Dry weather samples suitable for swimming	Water samples	Beach grade status
Estuarine	Oct 2017 to Apr 2020	99%	100	Stable

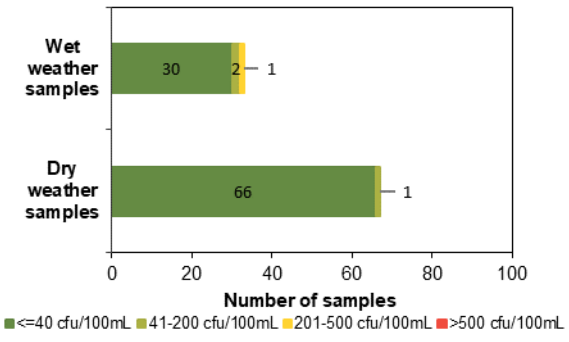
Sanitary inspection: Moderate



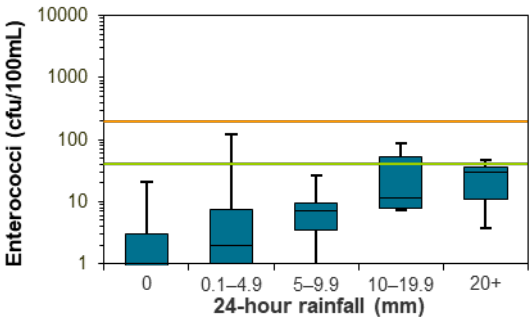
Microbial Assessment Category: A



Dry and wet weather water quality



Water quality in response to rainfall



Chinamans Beach

Beach grade: G

See ‘How to read this report’ for key to map.

Chinamans Beach is approximately 250 metres long and is a popular swimming area in Middle Harbour. It is backed by Rosherville Reserve.

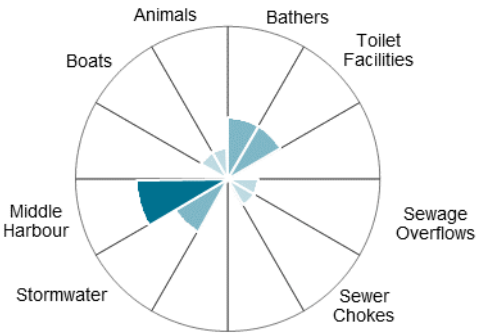
The Beach Suitability Grade of Good indicates microbial water quality is considered suitable for swimming most of the time but may be susceptible to pollution after rain, with several potential sources of faecal contamination including discharge from Middle Harbour.

Enterococci levels increased with increasing rainfall, occasionally exceeding the safe swimming limit after light rain, and often after 10 mm or more.

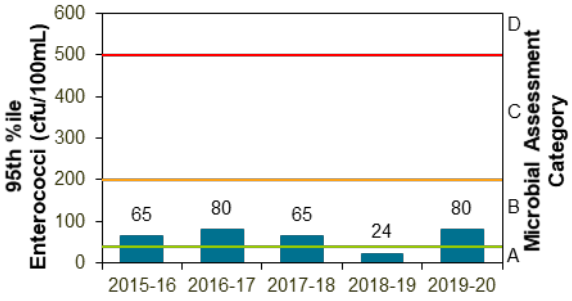
The site has been monitored since 1998.

Site type	Assessment period	Dry weather samples suitable for swimming	Water samples	Beach grade status
Estuarine	Oct 2017 to Apr 2020	97%	100	Stable

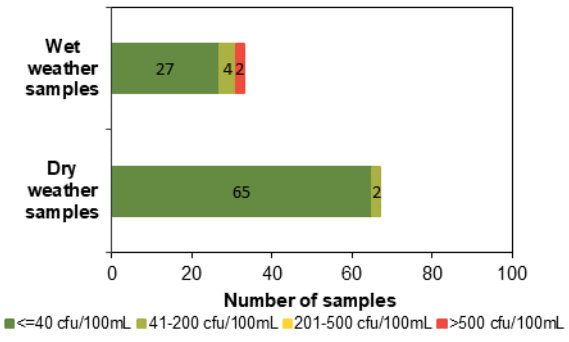
Sanitary inspection: Moderate



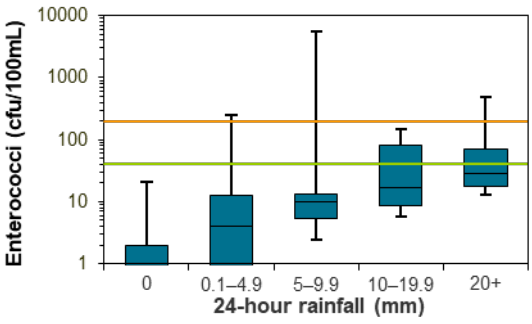
Microbial Assessment Category: B



Dry and wet weather water quality



Water quality in response to rainfall



Northbridge Baths

Beach grade: F

See 'How to read this report' for key to map.

Northbridge Baths is a 30 by 65 metre enclosed swimming area in Sailors Bay, Middle Harbour and is open year round.

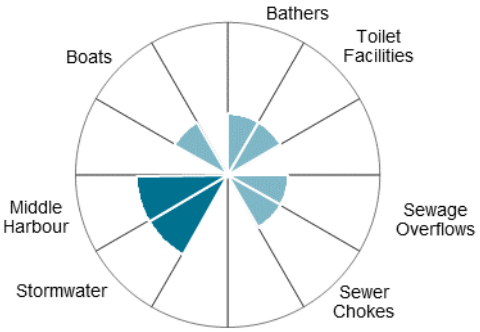
The Beach Suitability Grade of Fair indicates microbial water quality is occasionally susceptible to faecal pollution, usually triggered by rainfall, with several potential sources of faecal contamination including stormwater and upstream sources in Middle Harbour.

Enterococci levels increased with increasing rainfall, occasionally exceeding the safe swimming limit in response to light rain, and regularly after 5 mm or more.

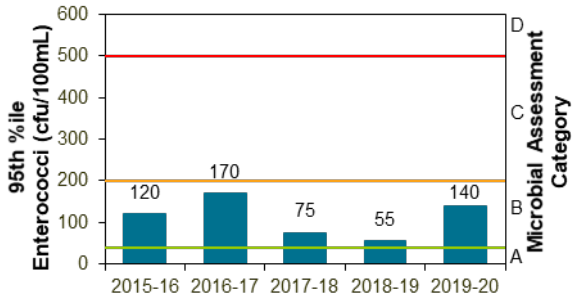
The site has been monitored since 1994.

Site type	Assessment period	Dry weather samples suitable for swimming	Water samples	Beach grade status
Estuarine	Oct 2017 to Apr 2020	96%	100	Stable

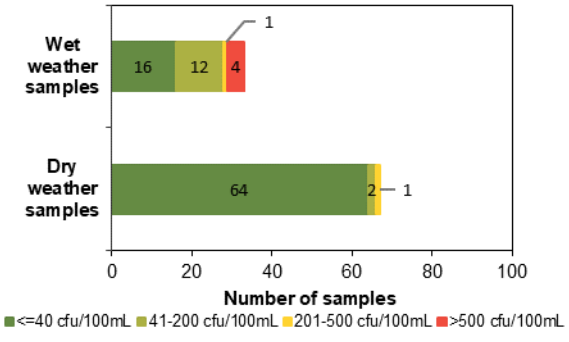
Sanitary inspection: High



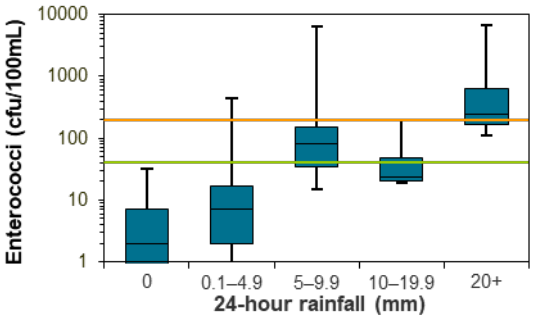
Microbial Assessment Category: B



Dry and wet weather water quality



Water quality in response to rainfall



Davidson Reserve

Beach grade: P

See ‘How to read this report’ for key to map.

Davidson Reserve is a 25 metre long swimming area situated in Middle Harbour and is backed by Garigal National Park and picnic area.

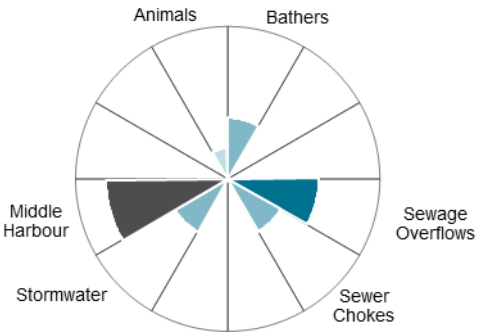
The Beach Suitability Grade of Poor indicates microbial water quality is susceptible to faecal pollution, particularly after rainfall and occasionally during dry weather conditions, with several potential sources of faecal contamination including sewage overflows and upstream sources in Middle Harbour.

Enterococci levels increased with increasing rainfall, occasionally exceeding the safe swimming limit after no rain and regularly after 5 mm or more.

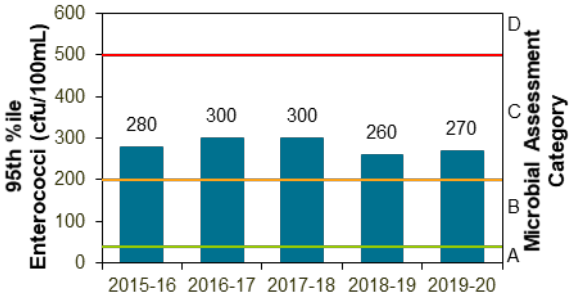
The site has been monitored since 1994.

Site type	Assessment period	Dry weather samples suitable for swimming	Water samples	Beach grade status
Estuarine	Oct 2017 to Apr 2020	91%	100	Stable

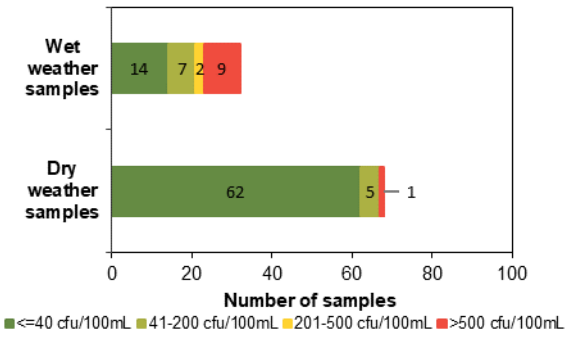
Sanitary inspection: High



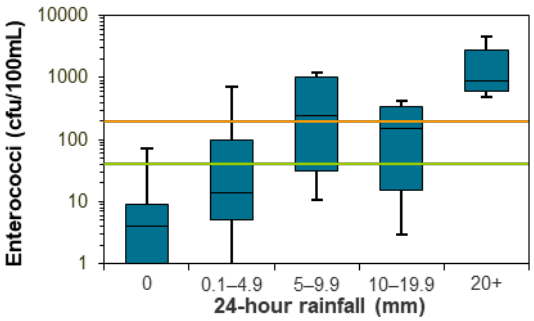
Microbial Assessment Category: C



Dry and wet weather water quality

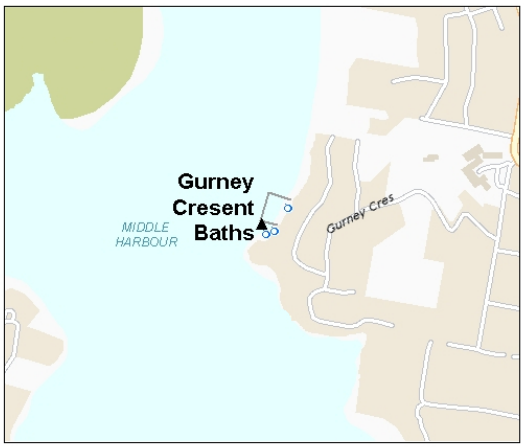


Water quality in response to rainfall



Gurney Crescent Baths

Beach grade: F



See ‘How to read this report’ for key to map.

Gurney Crescent Baths is a 20 metre square netted swimming area located at Pickering Point in Middle Harbour.

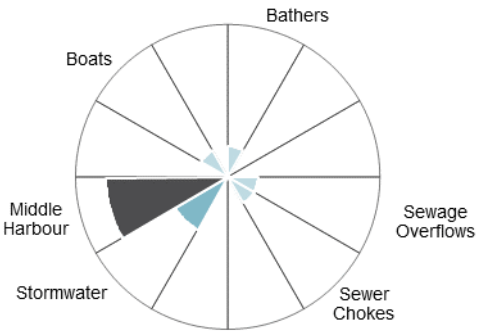
The Beach Suitability Grade of Fair indicates microbial water quality is occasionally susceptible to faecal pollution, usually triggered by rainfall, with several potential sources of faecal contamination including upstream sources in Middle Harbour and stormwater.

Enterococci levels increased with increasing rainfall, occasionally exceeding the safe swimming limit after light rain, and often after 5 mm or more.

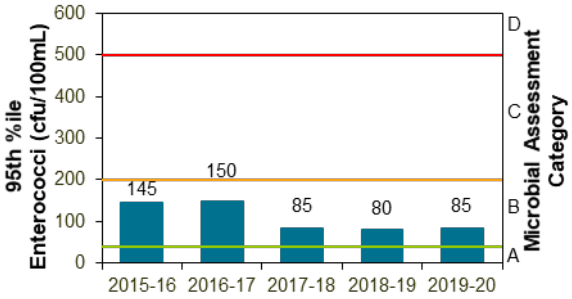
The site has been monitored since 1996.

Site type	Assessment period	Dry weather samples suitable for swimming	Water samples	Beach grade status
Estuarine	Oct 2017 to Apr 2020	97%	100	Stable

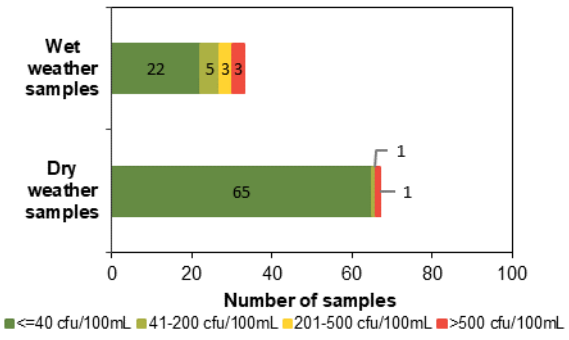
Sanitary inspection: High



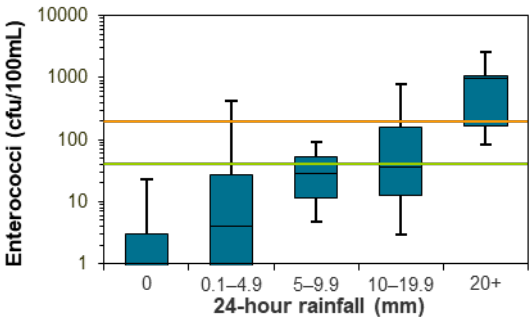
Microbial Assessment Category: B



Dry and wet weather water quality



Water quality in response to rainfall



Clontarf Pool

Beach grade: G

See ‘How to read this report’ for key to map.

Clontarf Pool is a small netted swimming area in Middle Harbour backed by a narrow sandy beach and a park.

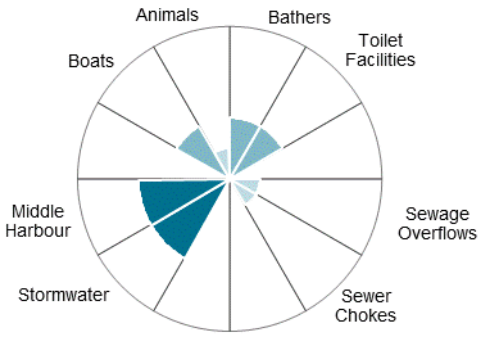
The Beach Suitability Grade of Good indicates microbial water quality is considered suitable for swimming most of the time but may be susceptible to pollution after rain, with several potential sources of faecal contamination including upstream sources in Middle Harbour and stormwater.

Enterococci levels increased with increasing rainfall, occasionally exceeding the safe swimming limit after light rain, and regularly after 20 mm or more.

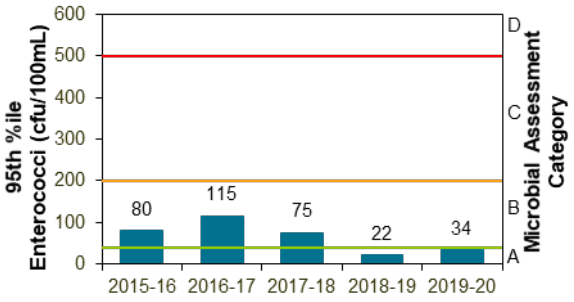
The site has been monitored since 1994.

Site type	Assessment period	Dry weather samples suitable for swimming	Water samples	Beach grade status
Estuarine	Oct 2017 to Apr 2020	96%	100	Stable

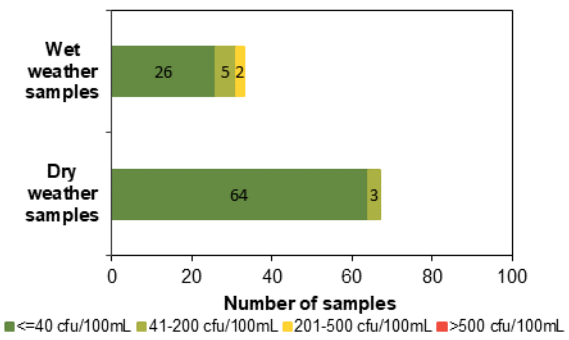
Sanitary inspection: Moderate



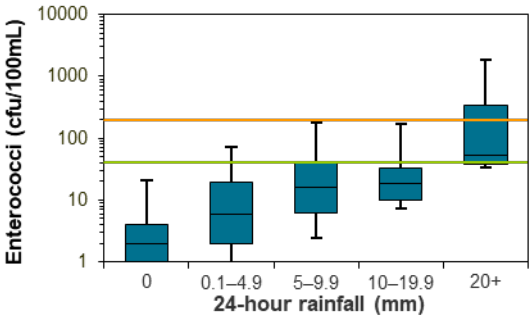
Microbial Assessment Category: A



Dry and wet weather water quality



Water quality in response to rainfall



Forty Baskets Pool

Beach grade: G

See 'How to read this report' for key to map.

Forty Baskets Pool is a 20 by 40 metre netted swimming area at the northern end of Forty Baskets Beach in North Harbour.

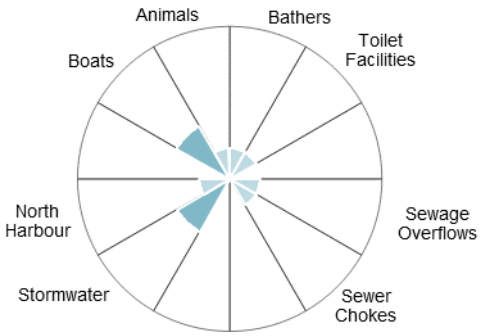
The Beach Suitability Grade of Good indicates microbial water quality is considered suitable for swimming most of the time but may be susceptible to pollution after rain, with several potential sources of minor faecal contamination.

Enterococci levels generally increased with increasing rainfall, occasionally exceeding the safe swimming limit after light rain, and often after 10 mm or more.

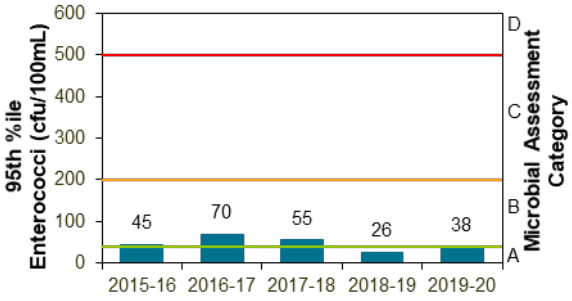
The site has been monitored since 1994.

Site type	Assessment period	Dry weather samples suitable for swimming	Water samples	Beach grade status
Estuarine	Oct 2017 to Apr 2020	100%	100	Stable

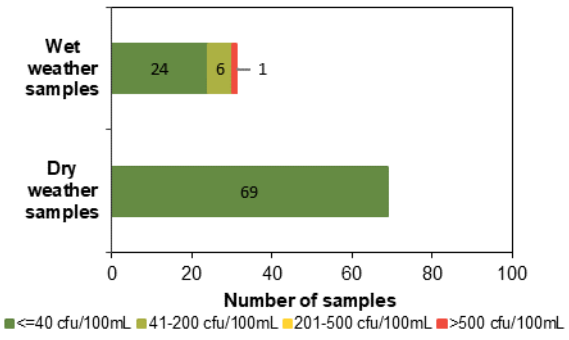
Sanitary inspection: Moderate



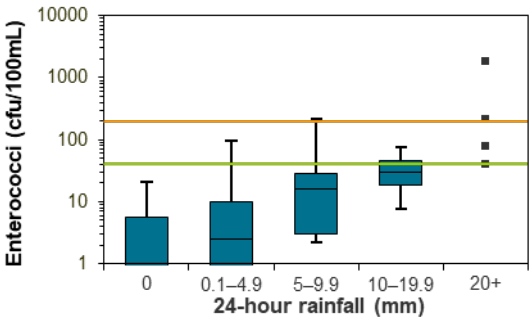
Microbial Assessment Category: A



Dry and wet weather water quality



Water quality in response to rainfall



Fairlight Beach

Beach grade: G

See ‘How to read this report’ for key to map.

Fairlight Beach is a narrow beach located in North Harbour. A 25 metre pool filled with water from the harbour is adjacent to the beach.

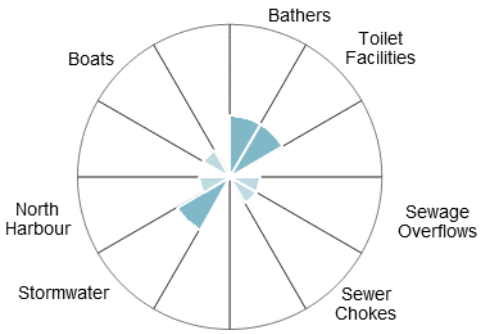
The Beach Suitability Grade of Good indicates microbial water quality is considered suitable for swimming most of the time but may be susceptible to pollution after rain, with several potential sources of minor faecal contamination.

Enterococci levels increased with increasing rainfall, occasionally exceeding the safe swimming limit after rainfall.

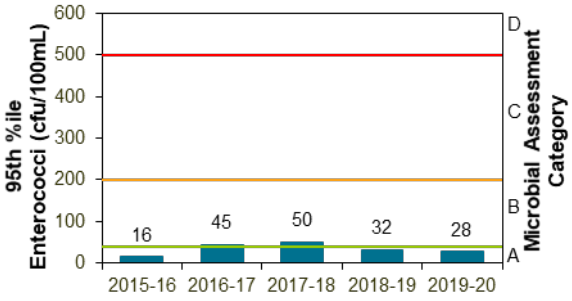
The site has been monitored since 1996.

Site type	Assessment period	Dry weather samples suitable for swimming	Water samples	Beach grade status
Estuarine	Oct 2017 to Apr 2020	97%	100	Stable

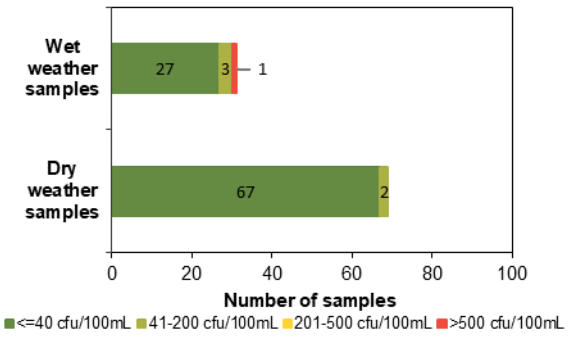
Sanitary inspection: Moderate



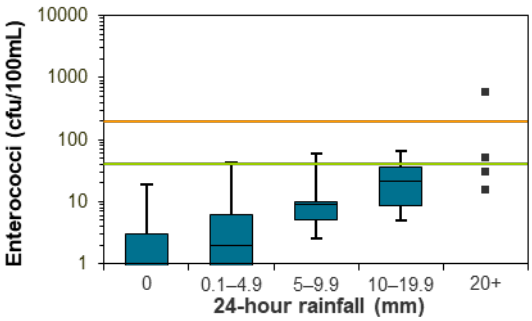
Microbial Assessment Category: A



Dry and wet weather water quality



Water quality in response to rainfall



Manly Cove

Beach grade: G

See 'How to read this report' for key to map.

Manly Cove is a netted swimming enclosure at the centre of the 250 metre long beach, adjacent to the Manly Ferry Terminal.

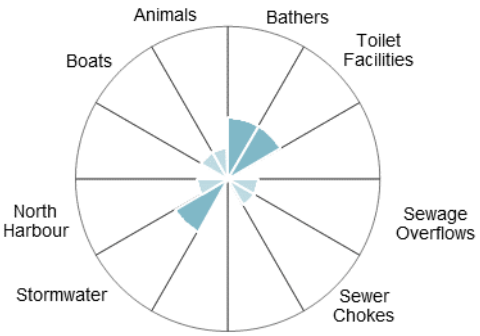
The Beach Suitability Grade of Good indicates microbial water quality is considered suitable for swimming most of the time but may be susceptible to pollution after rain, with several potential sources of minor faecal contamination.

Enterococci levels increased with increasing rainfall, occasionally exceeding the safe swimming limit after little or no rain, and regularly after 10 mm or more.

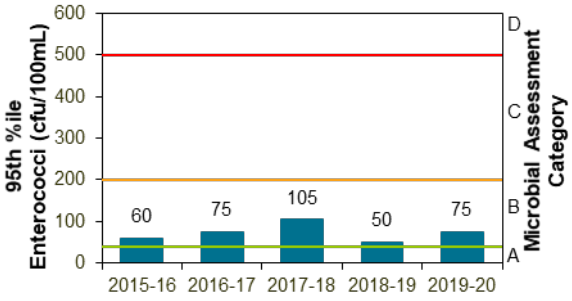
The site has been monitored since 1994.

Site type	Assessment period	Dry weather samples suitable for swimming	Water samples	Beach grade status
Estuarine	Oct 2017 to Apr 2020	91%	100	Stable

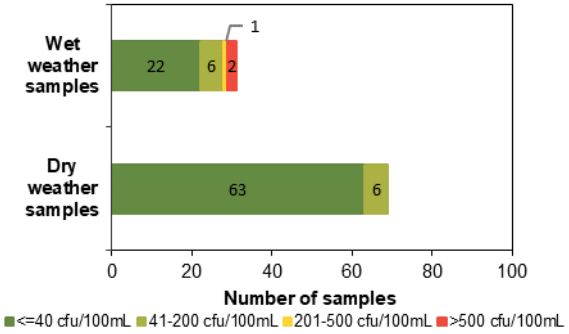
Sanitary inspection: Moderate



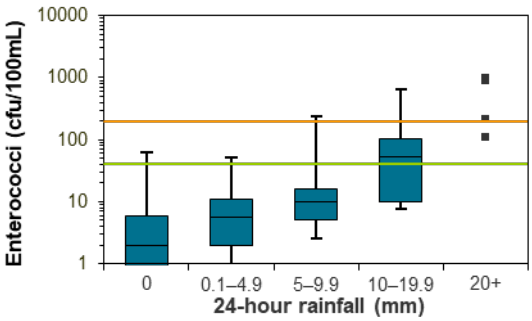
Microbial Assessment Category: B



Dry and wet weather water quality



Water quality in response to rainfall



Little Manly Cove

Beach grade: G

See 'How to read this report' for key to map.

The 30 metre square swimming enclosure is at the eastern end of the sandy beach in Little Manly Cove.

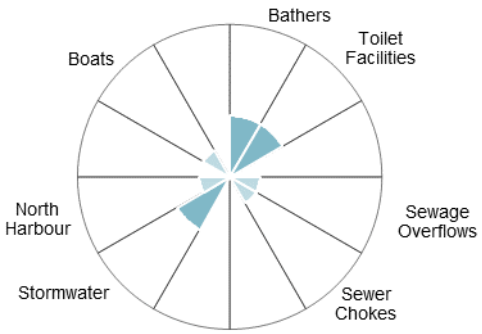
The Beach Suitability Grade of Good indicates microbial water quality is considered suitable for swimming most of the time but may be susceptible to pollution after rain, with several potential sources of minor faecal contamination.

Enterococci levels increased with increasing rainfall, occasionally exceeding the safe swimming limit after little or no rain, and regularly after 5 mm or more.

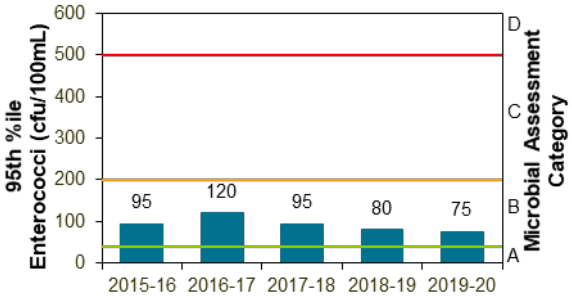
The site has been monitored since 1994.

Site type	Assessment period	Dry weather samples suitable for swimming	Water samples	Beach grade status
Estuarine	Oct 2017 to Apr 2020	96%	100	Stable

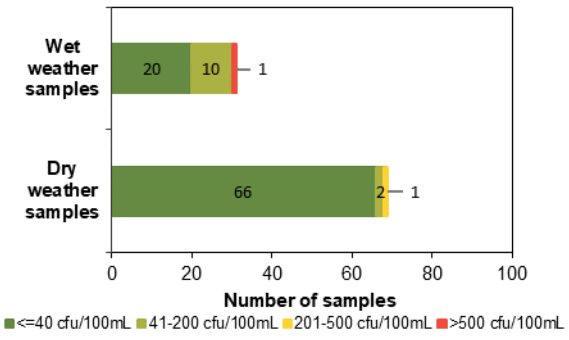
Sanitary inspection: Moderate



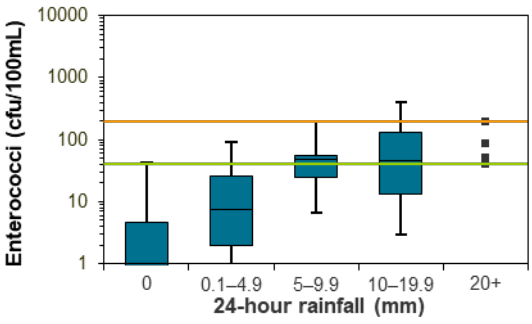
Microbial Assessment Category: B



Dry and wet weather water quality



Water quality in response to rainfall



Southern Sydney (Sutherland beaches, lower Georges River, Botany Bay & Port Hacking)

Overall results

93%
swimming sites graded Good or Very Good

Twenty-six of the 28 swimming sites were graded as Very Good or Good in 2019–2020. This is an excellent result and an improvement in performance from the previous year.

Percentage of sites graded as Very Good or Good:

- 2019–2020: 93%
- 2018–2019: 86%
- 2017–2018: 86%
- 2016–2017: 79%.

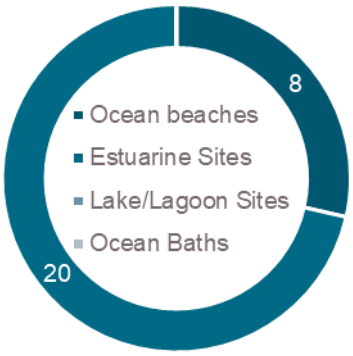
See the section on **How to read this report** on page 139 for an explanation of the graphs, tables and Beach Suitability Grades.

Beachwatch samples the ocean beaches every sixth day throughout the year, and estuarine beaches every sixth day between October and April, and monthly from May to September.

Best beaches

Greenhills Beach, Wanda Beach, Elouera Beach, North Cronulla Beach, South Cronulla Beach, Shelly Beach, Oak Park and Jibbon Beach.

These sites had excellent water quality and were suitable for swimming almost all of the time.



Site types in Southern Sydney region

Swimming sites monitored in the Southern Sydney region include ocean beaches and estuarine areas in Botany Bay, lower Georges River and Port Hacking, with each site type having a different response to rainfall-related impacts.

Estuarine swimming sites did not perform as well as ocean beaches due to lower levels of flushing, which increases the time needed to disperse and dilute pollution inputs, taking longer to recover from stormwater events.

As a general precaution swimming should be avoided during and for at least one day after heavy rain at ocean beaches, and for up to three days in estuarine areas, or if there are signs of stormwater pollution such as discoloured water or floating debris.

Ocean beaches

Beach Suitability Grades for Southern Sydney ocean beaches

All eight southern Sydney ocean beaches were graded as Very Good or Good in 2019–2020.

Greenhills, Wanda, Elouera, North Cronulla, South Cronulla, Shelly and Oak Park beaches were graded as Very Good. Water quality at these sites has been consistently excellent for many years and is suitable for swimming almost all of the time.

Boat Harbour was graded Good, a similar result to previous years. Water quality was mostly suitable for swimming, with 84% of dry weather samples within the safe swimming limit; however, elevated enterococci levels were occasionally recorded during dry weather or after light rainfall.

Estuarine beaches

Beach Suitability Grades for Southern Sydney estuarine beaches

Eighteen of the 20 estuarine sites were graded as Very Good or Good in 2019–2020.

Jibbon Beach was graded Very Good, consistent with the previous year. Water quality at this site was excellent, with few potential sources of minor faecal contamination.

Silver Beach, Como Baths, Jew Fish Bay Baths, Oatley Bay Baths, Carss Point Baths, Sandringham Baths, Dolls Point Baths, Ramsgate Baths, Monterey Baths, Brighton-Le-Sands Baths, Kyeemagh Baths, Yarra Bay, Frenchmans Bay, Congwong Bay, Horderns Beach, Lilli Pilli Baths and Gunnamatta Bay Baths were graded Good in 2019–2020. These sites had mostly good water quality, although elevated enterococci levels were recorded following rainfall.

Oatley Bay Baths and Carss Point Baths improved to Good from Poor in the previous year, due to improved microbial water quality. This improvement in water quality reflects a higher proportion of samples collected during dry weather compared to the 2018–2019 assessment period.

Gymea Bay Baths was graded Fair in 2019–2020, consistent with the previous year. While water quality at this site is frequently suitable for swimming during dry weather conditions, with 94% of dry weather samples within the safe swimming limit, enterococci levels increased significantly with increasing rainfall.

Foreshores Beach in Botany Bay was graded Poor in 2019–2020, an improvement from Very Poor in previous years. Swimming was mostly suitable during dry weather conditions, with 84% of dry weather samples within the safe

swimming limit during the assessment period. While microbial water quality has improved slightly this year, water quality was significantly impacted by faecal contamination during and following rainfall, and occasionally during dry weather. This year's improvement in microbial water quality is likely due to the higher proportion of samples collected during dry weather conditions compared to the 2018–2019 assessment period. The site is very susceptible to faecal contamination from the sewage overflows which discharge into Mill Stream. Swimming should be avoided during and for up to three days following light rainfall, or if there are signs of pollution such as discoloured water, odours or floating debris.

Further investigation is required at poorer performing sites to show the scale and extent of the problem, and the source of microbial contamination.

Management

Ocean beaches

Patrolled ocean beach
Photo: Beachwatch/EES, DPIE

Wanda Beach
Photo: Beachwatch/EES, DPIE

Under the NSW Government's Coastal and Estuary Grants Program, funding has been given to Sutherland Shire Council to prepare the Bate Bay Coastal Management Program (CMP). The program will identify coastal hazards (which could include some water quality management actions) and prioritise initiatives to manage these.

Sutherland Shire Council

Sutherland Shire Council continues to see the ongoing benefits from the Cronulla-Woolooware Wastewater Reuse Scheme (CWWRS). The facility can recycle up to four million litres of treated wastewater each day which is used to irrigate ovals and recreation areas across the Sutherland Shire. This includes public and private sites such as Greenhills Marang Parklands, Cronulla Golf Course, Woolooware High School, Woolooware Golf Course, Captain Cook Playing Fields and the Solander Playing Fields. The CWWRS has reduced the demand for potable water for irrigation purposes and reduced the amount of treated effluent discharged to ocean outfalls.

Sydney Water

To reduce the incidence of wet weather sewage overflows in beach catchments across the Cronulla Peninsula, Sydney Water has amplified sewer pipes and pumps and included storage tanks.

Sydney Water has inspected, cleaned and repaired sewer mains that have a high likelihood of discharging sewage to

waterways if they become blocked. When significant tree root intrusion to the public sewer from the private sewer was identified, property owners were requested to remedy the problem.

Botany Bay and lower Georges River

Under the NSW Government's Coastal and Estuary Grants Program, funding has been given to relevant councils to commence preparation of CMPs for the Cooks River Catchment and Georges River Estuary. Stage 1, the scoping studies have recently been completed and Stage 2 is progressing. The CMPs for these waterways will identify catchment pressures and prioritise management options for issues relating to coastal and estuary health. Water quality management actions such as stormwater infrastructure improvements, restoring and maintaining riparian areas, and strategic land-use planning will be considered during the process.

Several Sydney councils implement the Georges River Estuary Coastal Zone Management Plan (CZMP) including Fairfield, Sutherland Shire, Georges River and Bayside councils. With funding from the NSW Government's Coastal and Estuary Grants Program, a number of foreshore access areas have been identified for improvements and areas of the upper catchment have been identified for creek rehabilitation, which should improve the water quality of the Georges River.

Randwick City Council

Randwick City Council operates and maintains 13 stormwater harvesting treatment systems with UV filtration across the local government area. These systems treat stormwater by removing suspended solids, bacteria and other organic and inorganic materials before it is used for irrigation in surrounding landscaped and garden areas, saving Randwick City Council approximately 455 megalitres of water (which equates to 187 Olympic sized swimming pools or $1 million cost savings).

Randwick City Council maintains 34 GPTs on stormwater lines leading to the local bays, which are all cleaned regularly. In 2019–2020, approximately 230 tonnes of material was removed from these GPTs. There is also a systematic cleaning program for all drainage pits including a regular street sweeping program which assists with reducing stormwater pollution to the local bays. Council continues to conduct litter education campaigns throughout the local government area to educate residents on the proper disposal of waste. This program aims to reduce the amount of litter disposed on beaches and entering the ocean. Randwick Council also commenced a cigarette butt litter program in April 2018 aiming to reduce cigarette litter at beaches.

A **Coastal Management Program** (CMP) outlines a long-term strategy for managing the coast, in line with the *Coastal Management Act 2016*.

The NSW Government provides guidance and funding through the Coastal and Estuary Grants Program for local councils to prepare and implement CMPs.

Under the previous *Coastal Protection Act 1979*, councils developed a **Coastal Zone Management Plan** (CZMP) to address coastal issues. Councils can continue to implement priority actions from certified CZMPs with funding assistance from the NSW Government's Coastal and Estuary Grants Program until 2021.

Frenchmans Bay
Photo: Beachwatch/EES, DPIE

Council officers undertake their routine inspections and regulatory duties to ensure stormwater pollution is investigated and mitigated to reduce impacts to the water quality of local recreational waterways.

Randwick City Council has a strategic program and reactive process to monitor and assess the condition of the stormwater pipes in the local area using CCTV.

Bayside Council

Bayside Council continues to undertake various works and maintenance projects to maintain and improve water quality. This includes maintenance of aerators in waterbodies, ongoing maintenance of litter and sediment control traps preventing pollutants from entering the waterways, removal of aquatic weeds and excess sediment build-up in local waterways, education and Bushcare programs for the community as well as dune and estuarine vegetation restoration programs.

Georges River Council

Georges River Council continues to prevent litter, organic matter, sediment and oil from entering local waterways through water sensitive urban design and GPT installation projects.

Georges River Council has a number of stormwater harvesting plants that treat stormwater, reducing flows and pollution loads entering downstream waterways. The treated water is subsequently utilised by council for irrigation, vehicle wash-down, street sweeping and other uses.

Carss Point Baths
Photo: Cameron Board/EES, DPIE

Georges River Council has commenced a foreshore improvement project associated with the removal of the existing concrete vertical seawall and a section of the Carss Park stormwater channel to develop a natural creek line and foreshore environment within Carss Bush Park. This work will involve the construction of a ‘natural’ creek line reintroducing protected ecological communities of saltmarsh, mangrove and swamp oak forest, while developing intertidal habitats including rockpools and intertidal mudflat zones. The new foreshore structure will influence ecological habitats above and below the mean high water mark (MHWM), creating a link between aquatic ecological communities and the terrestrial environment, while improving stormwater quality entering Kogarah Bay.

Georges River Council is also reinstating the creek line and associated environmental habitats of Upper Boggywell Creek in Gannons Park, which is a large (35 hectare) regional park in Peakhurst. It is proposed that this sustainable water management scheme will treat stormwater through a series

of bioretention systems, wetlands and swales and involve the daylighting and re-naturalisation of the former Boggywell Creek. In addition to significantly improving the quality of stormwater being discharged to the Georges River, some of the treated water will be harvested and re-used for irrigating eight sports fields within Gannons Park.

Sutherland Shire Council

Como Baths
Photo: Cameron Board/EES, DPIE

Sutherland Shire Council in conjunction with Roads and Maritime Services completed significant land remediation at Woolooware Bay during the completion of a shared pathway. The work has improved water quality at the site, which was once contaminated from earlier oyster farming activity. The foreshore area remains an ecological sanctuary and vital habitat for 30 types of migratory shorebirds of which four are listed as endangered and 10 as vulnerable.

Council monitors the quality of the shire's waterways with its Strategic Water Monitoring Program (SWaMP). The program tests physical, chemical and biological (macroinvertebrates) condition to measure the health of streams and waterways.

Sutherland Shire Council's stormwater levy funds projects such as the installation of pipes, drains and stormwater quality improvement devices, as well as riparian revegetation works to alleviate flooding and improve water quality in creeks and rivers.

Council recently completed construction of two stormwater quality improvement devices in Miranda in the Gwawley Bay catchment. These will treat stormwater from over 80 hectares of the catchment before it enters the Georges River. The council has installed more than 250 devices to improve stormwater quality, including artificial wetlands, GPTs and continuous deflective separators.

Sutherland Shire Council has also continued the maintenance of its creek restoration works, identified in the Waterway Rehabilitation Program, including weed removal, bank stabilisation and revegetation at several key locations along the Georges River.

Sydney Water

Sydney Water has inspected, cleaned and repaired sewer mains on the northern and western sides of Botany Bay that have a high likelihood of discharging sewage to waterways if they become blocked. When significant tree root intrusion to the public sewer from the private sewer was identified, property owners were requested to remedy the problem.

Port Hacking

Sutherland Shire Council

Sutherland Shire Council's Waterways Rehabilitation Program for 2019–20 includes a reach of Ewey Creek which starts in Miranda, and flows into Yowie Bay within Port Hacking. Rehabilitation works will involve creek bank stabilisation, including planting of more than 4000 native plants grown at council's community nursery. Woody weeds, exotic vines and scramblers will be treated and removed to allow native plants to flourish. The works will improve water quality, and the area's aesthetics and biodiversity.

Gunnamatta Bay Baths
Photo: Cameron Board/EES, DPIE

Council monitors the quality of the shire's waterways with its SWaMP. The program tests physical, chemical and biological (macroinvertebrates) condition to measure the health of streams and waterways.

There are 430 registered onsite sewage management systems in the Port Hacking catchment. The majority of these systems dispose of sewage by pumping it to the sewer main. Sutherland Shire Council inspects these systems to ensure they are operating correctly and to identify risks to human health or the environment.

Sydney Water

Sydney Water has inspected, cleaned and repaired sewer mains on the northern side of Port Hacking that have a high likelihood of discharging sewage to waterways if they become blocked. When significant tree root intrusion to the public sewer from the private sewer was identified, property owners were asked to remedy the problem.

To reduce the incidence of wet weather sewage overflows in the catchments of Gunnamatta Bay Baths, Sydney Water has amplified pipes and pumps and included storage tanks across the Cronulla Peninsula.

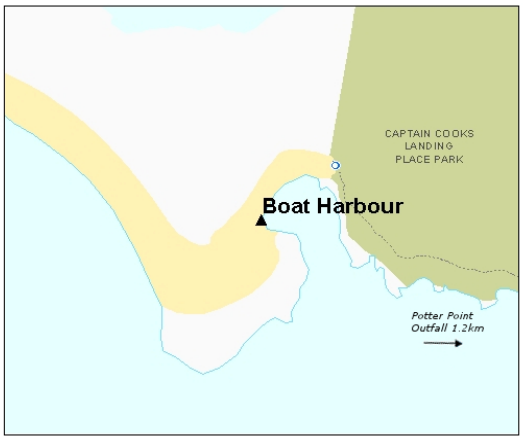
Sampling sites at Beach Suitability Grades at Sydney's Southern beaches

Sampling sites and Beach Suitability Grades in Botany Bay and lower Georges River

Sampling sites and Beach Suitability Grades in Port Hacking

Boat Harbour

Beach grade: G



See ‘How to read this report’ for key to map.

Boat Harbour is a 150 metre long unpatrolled private beach at the northern end of Bate Bay. It is the beach closest to the Cronulla WWTP outfall at Potter Point.

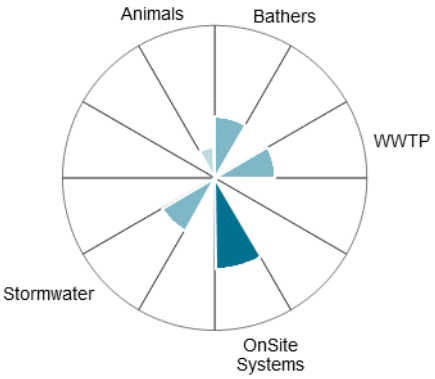
The Beach Suitability Grade of Good indicates microbial water quality is considered suitable for swimming most of the time but may be susceptible to pollution after rain, with several potential sources of faecal contamination including stormwater and onsite sewer systems behind the beach.

Enterococci levels had little response to rainfall, occasionally exceeding the safe swimming limit after little or no rain, and often after 5 mm or more.

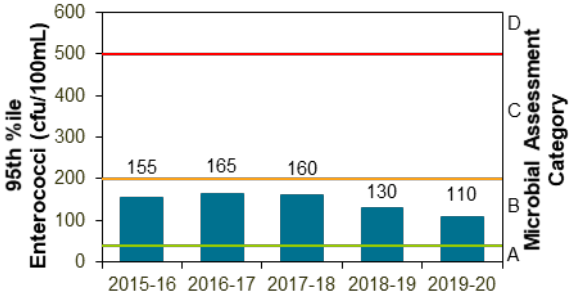
The site has been monitored since 1989.

Site type	Assessment period	Dry weather samples suitable for swimming	Water samples	Beach grade status
Ocean beach	May 2018 to Apr 2020	84%	100	Stable

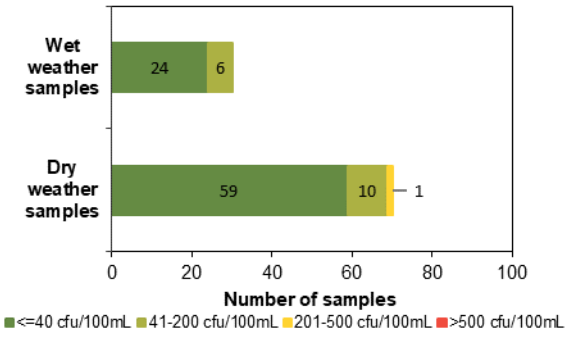
Sanitary inspection: Moderate



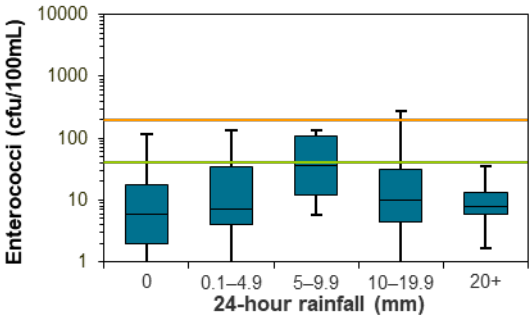
Microbial Assessment Category: B



Dry and wet weather water quality



Water quality in response to rainfall



Greenhills Beach

Beach grade: VG

See ‘How to read this report’ for key to map.

Greenhills Beach is three kilometres long and situated at the northern end of Bate Bay. The beach is not patrolled.

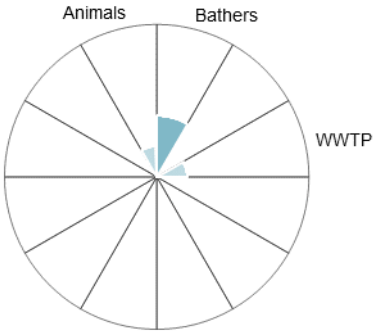
The Beach Suitability Grade of Very Good indicates microbial water quality is considered suitable for swimming almost all of the time, with few potential sources of faecal contamination.

Enterococci levels increased slightly with increasing rainfall, occasionally exceeding the safe swimming limit after 5 mm or more of rain.

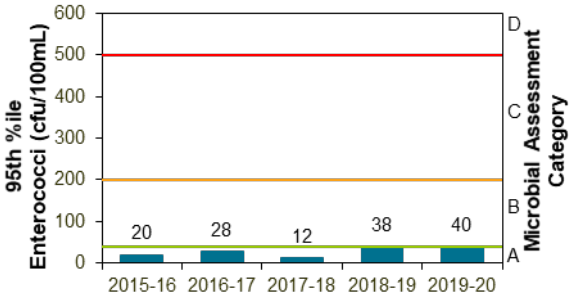
The site has been monitored since 1989.

Site type	Assessment period	Dry weather samples suitable for swimming	Water samples	Beach grade status
Ocean beach	May 2018 to Apr 2020	97%	100	Stable

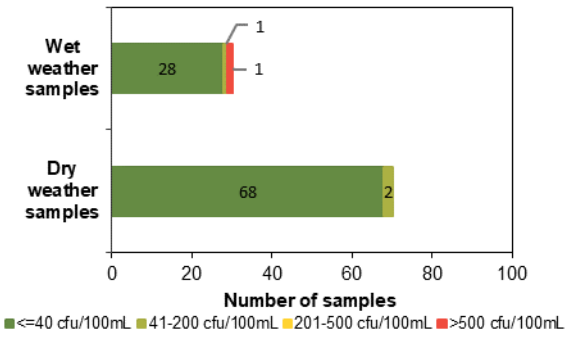
Sanitary inspection: Low



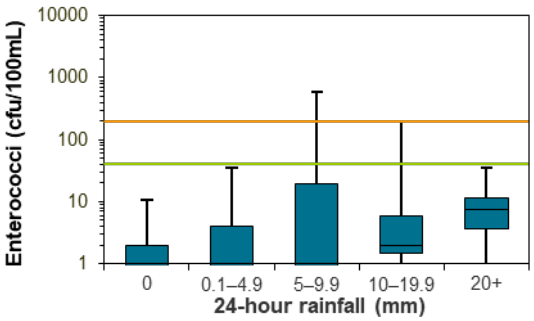
Microbial Assessment Category: A



Dry and wet weather water quality



Water quality in response to rainfall



Wanda Beach

Beach grade: VG

See ‘How to read this report’ for key to map.

Wanda, Elouera and North Cronulla beaches form a 1.5 kilometre stretch of beach towards the southern end of Bate Bay. Lifeguards patrol from October to April.

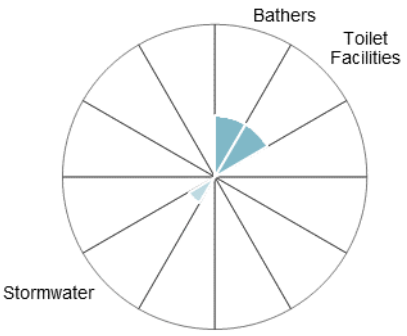
The Beach Suitability Grade of Very Good indicates microbial water quality is considered suitable for swimming almost all of the time, with few potential sources of faecal contamination.

Enterococci levels increased slightly with increasing rainfall, occasionally exceeding the safe swimming limit in response to 10 mm or more of rain.

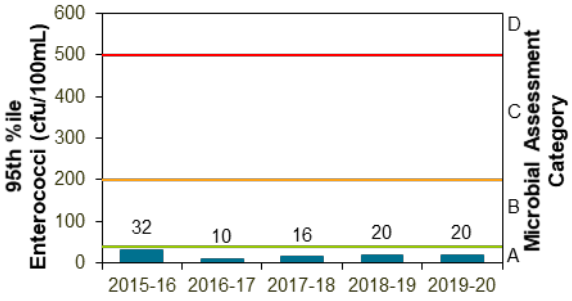
The site has been monitored since 1989.

Site type	Assessment period	Dry weather samples suitable for swimming	Water samples	Beach grade status
Ocean beach	Jun 2017 to Apr 2020	99%	100	Stable

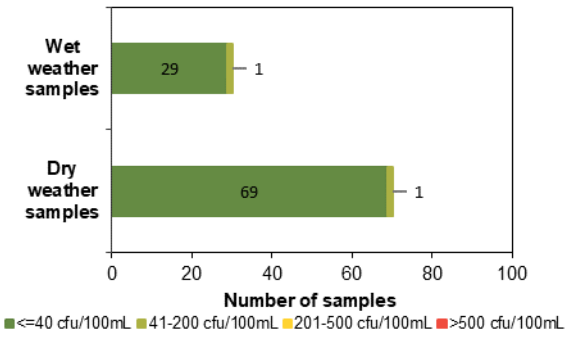
Sanitary inspection: Low



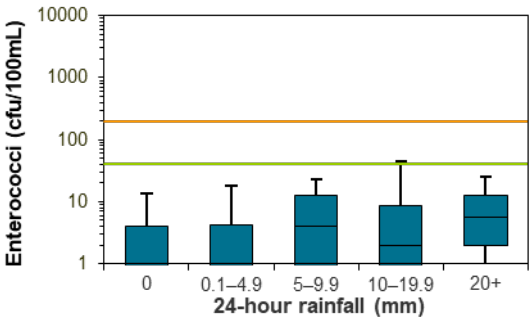
Microbial Assessment Category: A



Dry and wet weather water quality

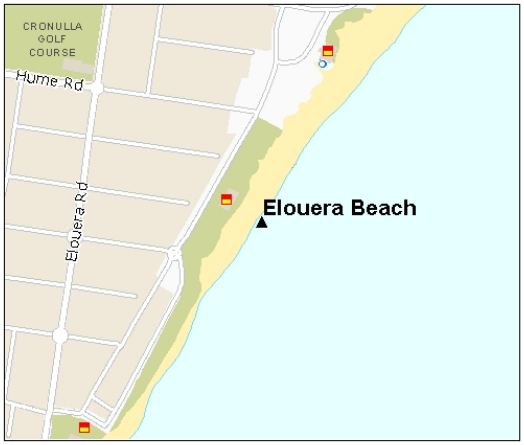


Water quality in response to rainfall



Elouera Beach

Beach grade: VG



See ‘How to read this report’ for key to map.

Wanda, Elouera and North Cronulla beaches form a 1.5 kilometre stretch of beach towards the southern end of Bate Bay. Lifeguards patrol the beach from October to April.

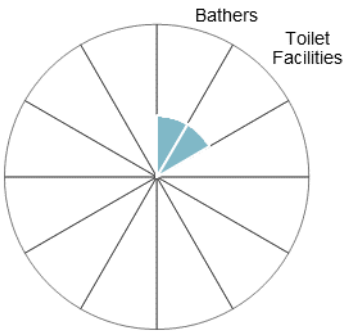
The Beach Suitability Grade of Very Good indicates microbial water quality is considered suitable for swimming almost all of the time, with few potential sources of faecal contamination.

Enterococci levels increased slightly with increasing rainfall, but generally remained below the safe swimming limit across all rainfall categories.

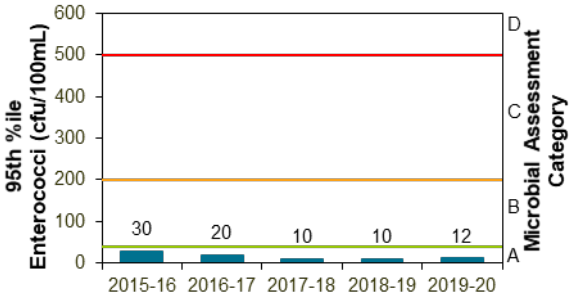
The site has been monitored since 1989.

Site type	Assessment period	Dry weather samples suitable for swimming	Water samples	Beach grade status
Ocean beach	May 2018 to Apr 2020	97%	100	Stable

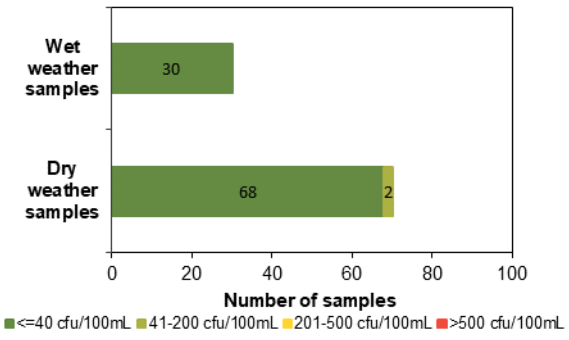
Sanitary inspection: Low



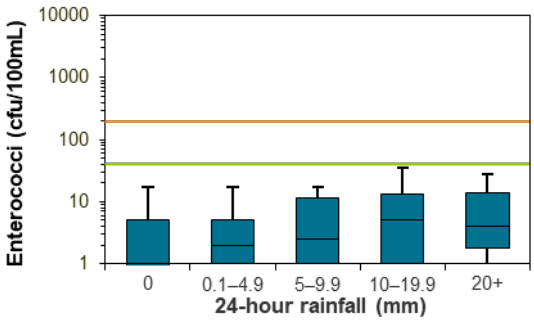
Microbial Assessment Category: A



Dry and wet weather water quality



Water quality in response to rainfall



North Cronulla Beach

Beach grade: VG

See ‘How to read this report’ for key to map.

North Cronulla Beach is at the southern end of a 1.5 kilometre stretch of beach in Bate Bay. Lifeguards patrol the beach all year round.

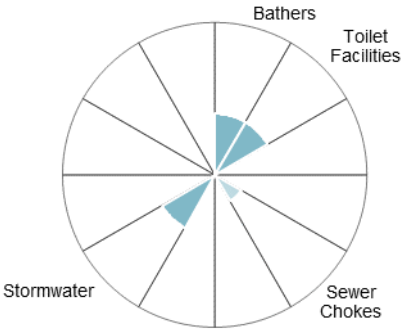
The Beach Suitability Grade of Very Good indicates microbial water quality is considered suitable for swimming almost all of the time, with few potential sources of faecal contamination.

Enterococci levels increased slightly with increasing rainfall, occasionally exceeding the safe swimming limit in response to 5 mm or more of rain.

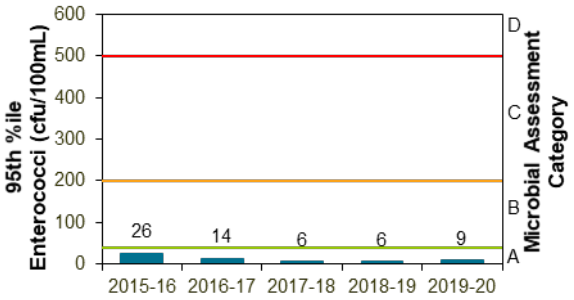
The site has been monitored since 1989.

Site type	Assessment period	Dry weather samples suitable for swimming	Water samples	Beach grade status
Ocean beach	May 2018 to Apr 2020	99%	100	Stable

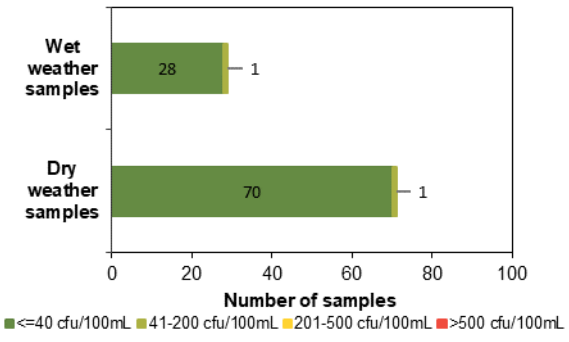
Sanitary inspection: Low



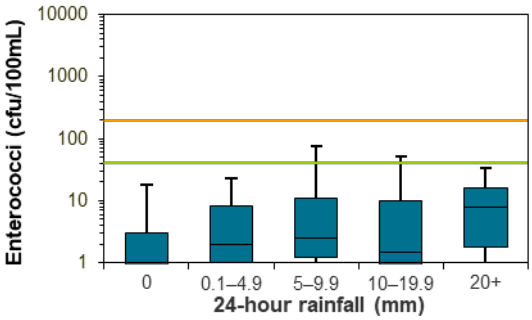
Microbial Assessment Category: A



Dry and wet weather water quality



Water quality in response to rainfall



South Cronulla Beach

Beach grade: VG

See ‘How to read this report’ for key to map.

South Cronulla beach is 300 metres long and situated at the southern end of Bate Bay. Lifeguards patrol the beach all year round.

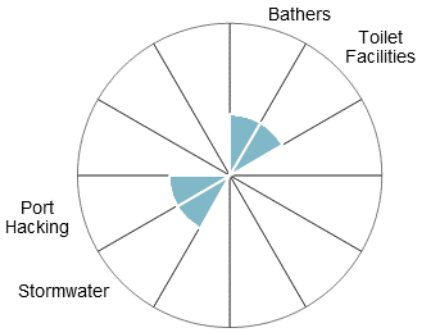
The Beach Suitability Grade of Very Good indicates microbial water quality is considered suitable for swimming almost all of the time, with few potential sources of faecal contamination.

Enterococci levels increased slightly with increasing rainfall, occasionally exceeding the safe swimming limit after light rainfall.

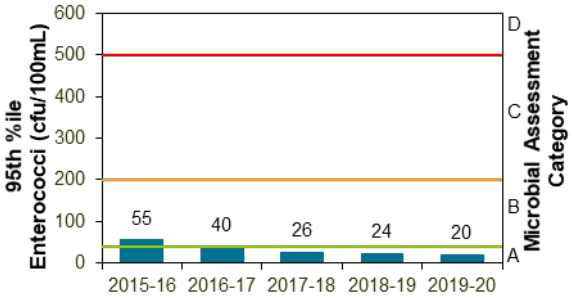
The site has been monitored since 1989.

Site type	Assessment period	Dry weather samples suitable for swimming	Water samples	Beach grade status
Ocean beach	Jun 2018 to Apr 2020	99%	100	Stable

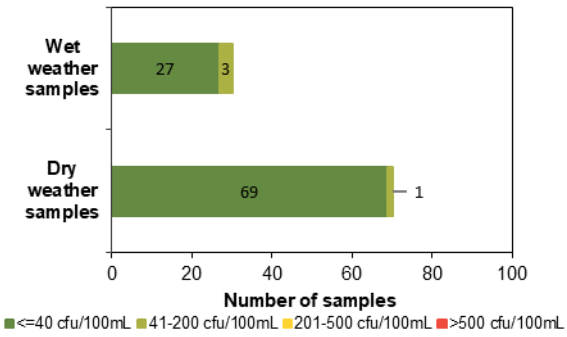
Sanitary inspection: Low



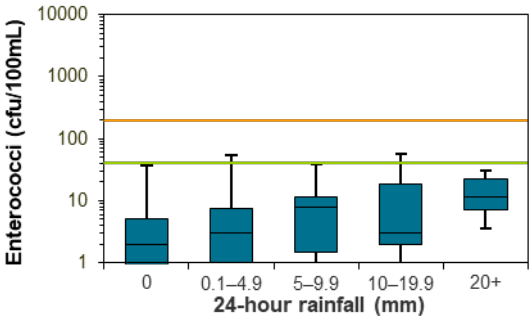
Microbial Assessment Category: A



Dry and wet weather water quality



Water quality in response to rainfall



Shelly Beach

Beach grade: VG

See ‘How to read this report’ for key to map.

Shelly beach is 50 metres long and is not patrolled by lifeguards. The adjacent ocean pool is the most suitable area for swimming.

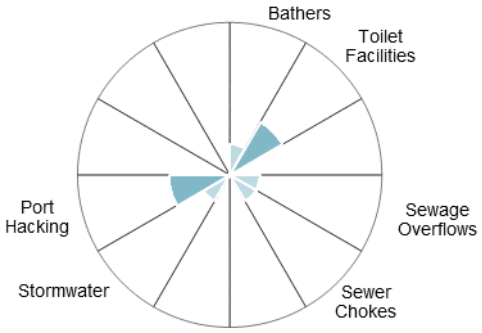
The Beach Suitability Grade of Very Good indicates microbial water quality is considered suitable for swimming almost all of the time, with few potential sources of significant faecal contamination.

Enterococci levels increased slightly with increasing rainfall, but generally remained below the safe swimming limit across most rainfall categories.

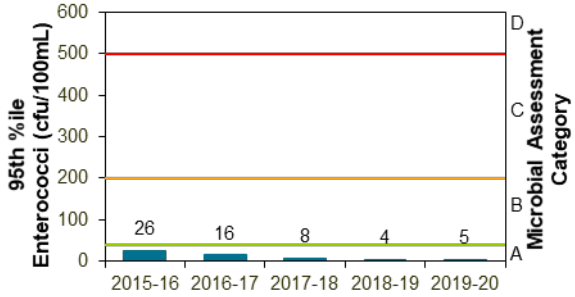
The site has been monitored since 1989.

Site type	Assessment period	Dry weather samples suitable for swimming	Water samples	Beach grade status
Ocean beach	May 2018 to Apr 2020	97%	100	Stable

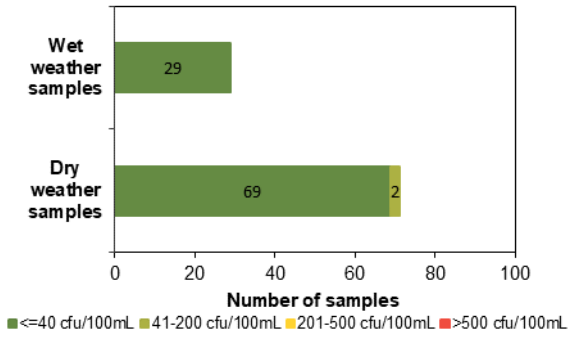
Sanitary inspection: Low



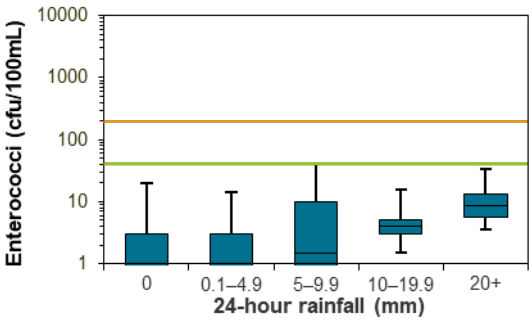
Microbial Assessment Category: A



Dry and wet weather water quality

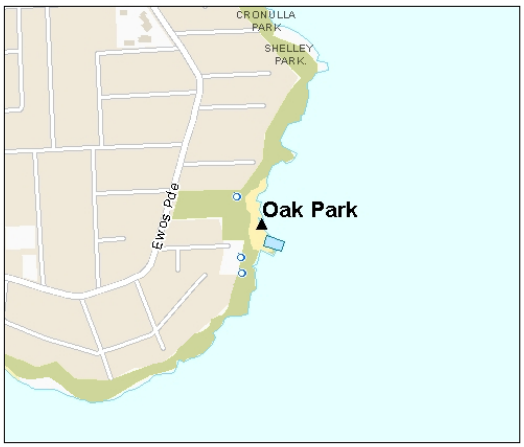


Water quality in response to rainfall



Oak Park

Beach grade: VG



See ‘How to read this report’ for key to map.

Oak Park beach is 15 metres long, with the most suitable area for swimming adjacent to the ocean pool. Lifeguards do not patrol the swimming area.

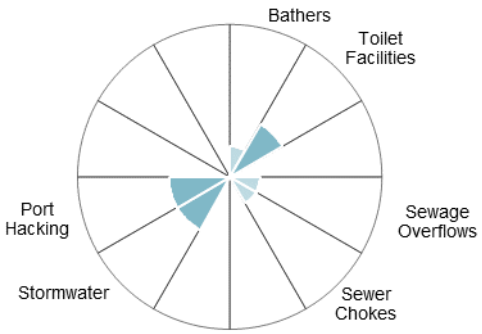
The Beach Suitability Grade of Very Good indicates microbial water quality is considered suitable for swimming almost all of the time, with few potential sources of significant faecal contamination.

Enterococci levels increased slightly with increasing rainfall, occasionally exceeding the safe swimming limit in response to 5 mm or more of rain.

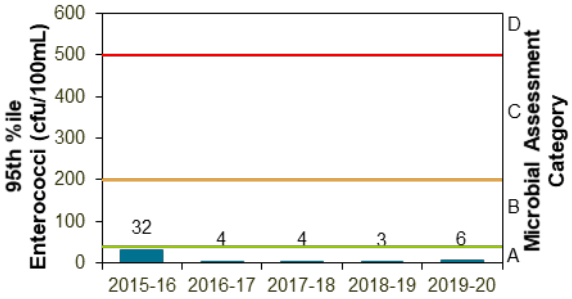
The site has been monitored since 1989.

Site type	Assessment period	Dry weather samples suitable for swimming	Water samples	Beach grade status
Ocean beach	May 2018 to Apr 2020	100%	100	Stable

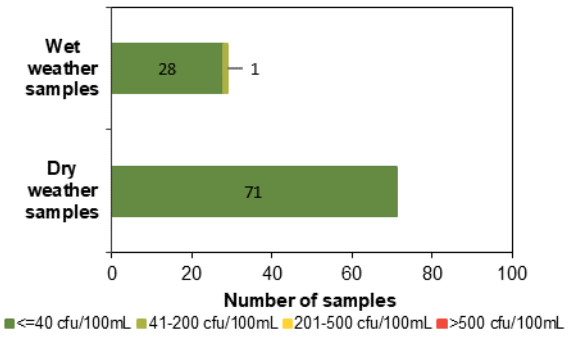
Sanitary inspection: Low



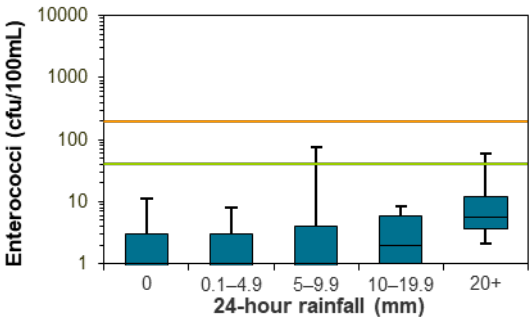
Microbial Assessment Category: A



Dry and wet weather water quality



Water quality in response to rainfall



Silver Beach

Beach grade: G

See 'How to read this report' for key to map.

Silver Beach is a netted swimming area at the centre of a 2.8 kilometre long beach on the southern shore of Botany Bay.

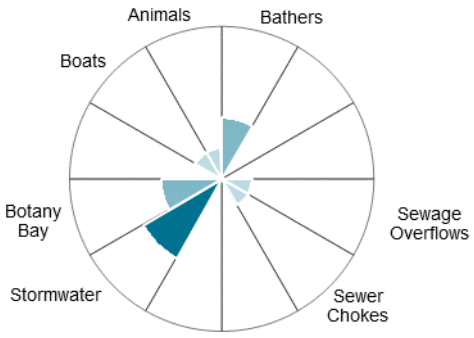
The Beach Suitability Grade of Good indicates microbial water quality is considered suitable for swimming most of the time but may be susceptible to pollution after rain, with several potential sources of faecal contamination including stormwater.

Enterococci levels increased slightly with increasing rainfall, occasionally exceeding the safe swimming limit after light rain.

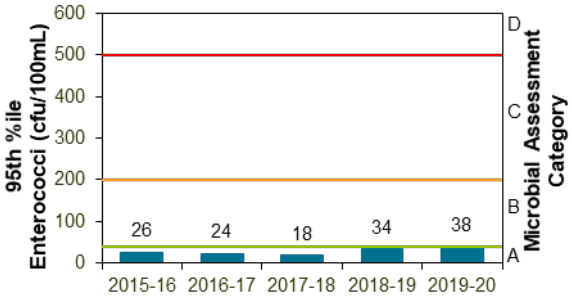
The site has been monitored since 1994.

Site type	Assessment period	Dry weather samples suitable for swimming	Water samples	Beach grade status
Estuarine	Oct 2017 to Apr 2020	93%	100	Stable

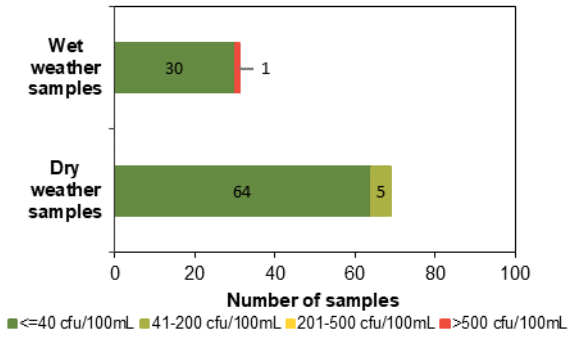
Sanitary inspection: Moderate



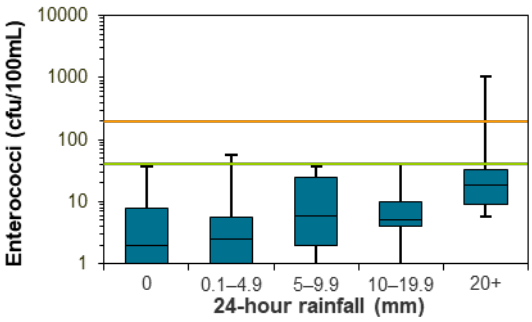
Microbial Assessment Category: A



Dry and wet weather water quality



Water quality in response to rainfall



Como Baths

Beach grade: G

See ‘How to read this report’ for key to map.

Como Baths is approximately 25 metres wide and backed by a narrow sandy beach in the lower Georges River.

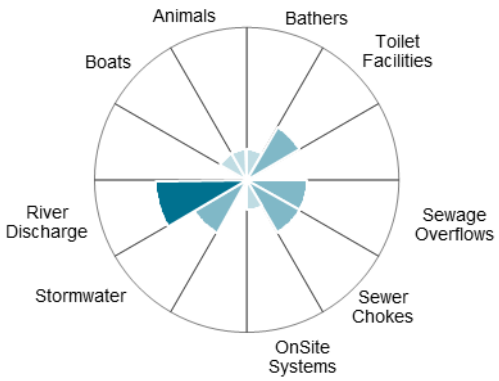
The Beach Suitability Grade of Good indicates microbial water quality is considered suitable for swimming most of the time but can be susceptible to pollution after rain, with several potential sources of faecal contamination including upstream sources in the Georges River.

Enterococci levels increased with increasing rainfall, often exceeding the safe swimming limit in response to 5 mm or more of rain, and usually after 20 mm or more.

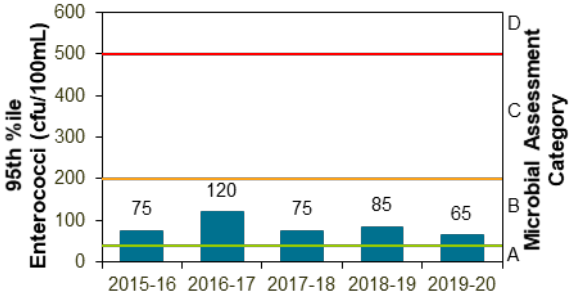
The site has been monitored since 1994.

Site type	Assessment period	Dry weather samples suitable for swimming	Water samples	Beach grade status
Estuarine	Oct 2017 to Apr 2020	95%	100	Stable

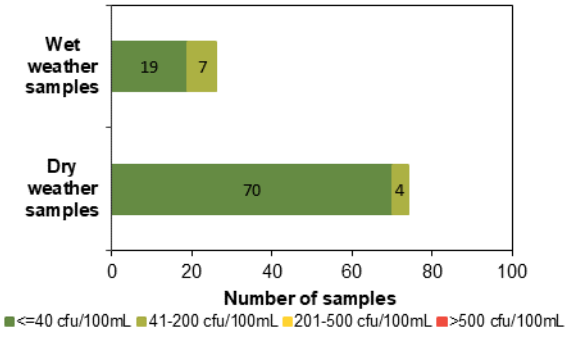
Sanitary inspection: Moderate



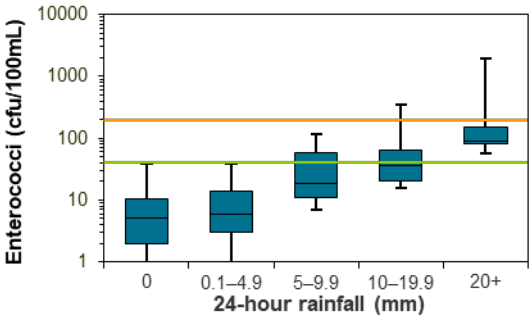
Microbial Assessment Category: B



Dry and wet weather water quality



Water quality in response to rainfall



Jew Fish Bay Baths

Beach grade: G

See ‘How to read this report’ for key to map.

Jew Fish Bay Baths is a 200 metre long netted swimming area located in Jew Fish Bay in the lower Georges River.

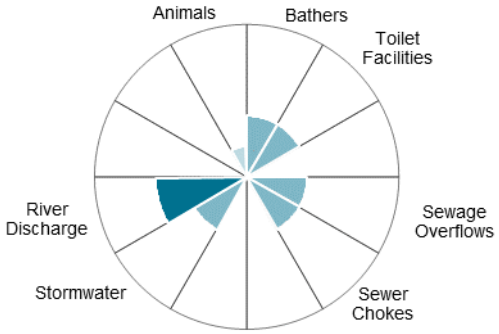
The Beach Suitability Grade of Good indicates microbial water quality is considered suitable for swimming most of the time but may be susceptible to pollution after rain, with several potential sources of faecal contamination including discharge from the Georges River.

Enterococci levels increased with increasing rainfall, occasionally exceeding the safe swimming limit after little or no rain, and often after 10 mm or more.

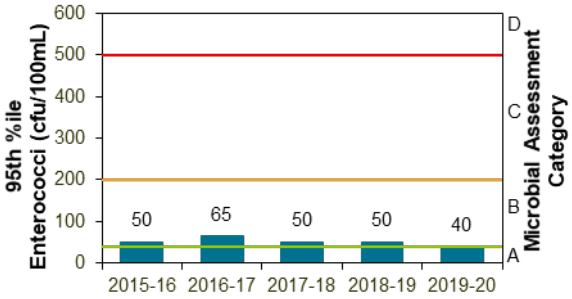
The site has been monitored since 1994.

Site type	Assessment period	Dry weather samples suitable for swimming	Water samples	Beach grade status
Estuarine	Oct 2017 to Apr 2020	95%	100	Stable

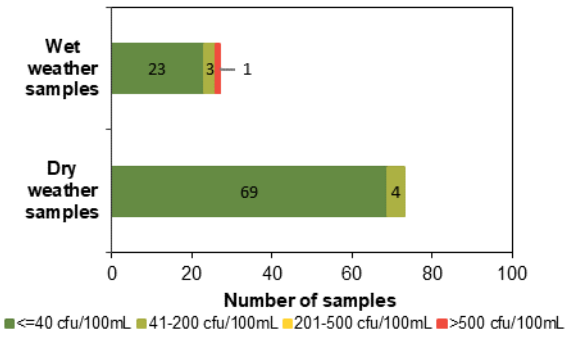
Sanitary inspection: Moderate



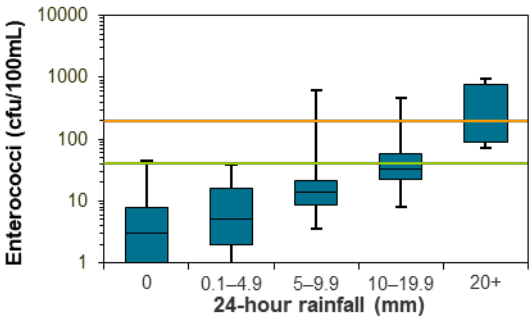
Microbial Assessment Category: A



Dry and wet weather water quality

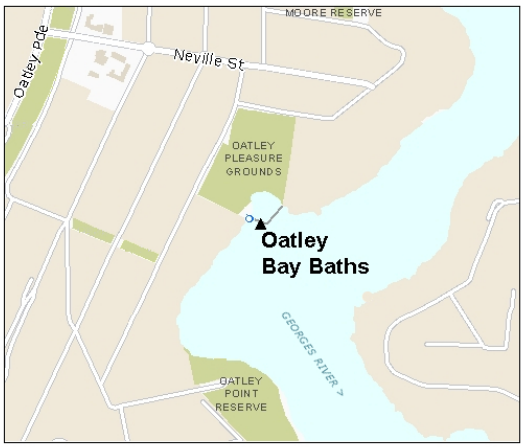


Water quality in response to rainfall



Oatley Bay Baths

Beach grade: G



See ‘How to read this report’ for key to map.

Oatley Bay Baths is a netted swimming area located on the western shore of Oatley Bay in the lower Georges River.

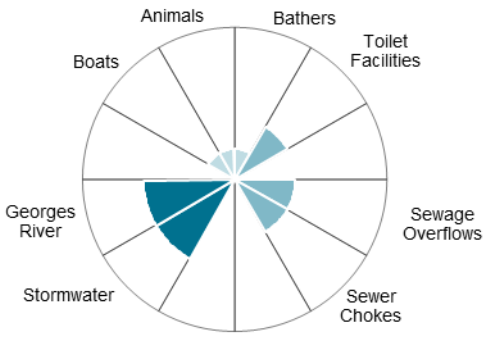
The Beach Suitability Grade of Good indicates microbial water quality is considered suitable for swimming most of the time but may be susceptible to pollution after rain, with several potential sources of faecal contamination including upstream sources in the Georges River and stormwater.

Enterococci levels increased with increasing rainfall, occasionally exceeding the safe swimming limit after little or no rain, and often after 5 mm or more.

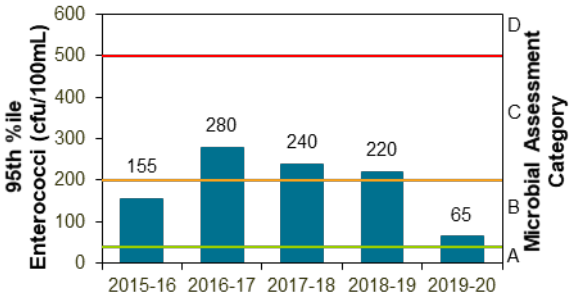
The site has been monitored since 1994.

Site type	Assessment period	Dry weather samples suitable for swimming	Water samples	Beach grade status
Estuarine	Oct 2017 to Apr 2020	93%	100	Improved

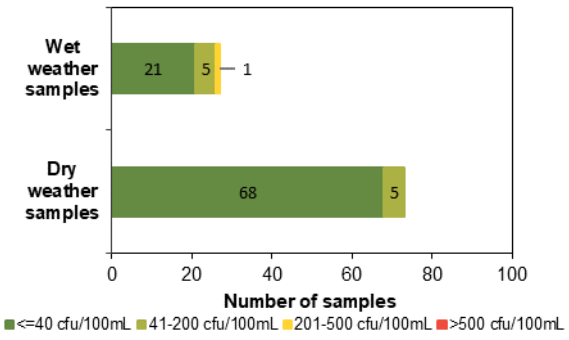
Sanitary inspection: Moderate



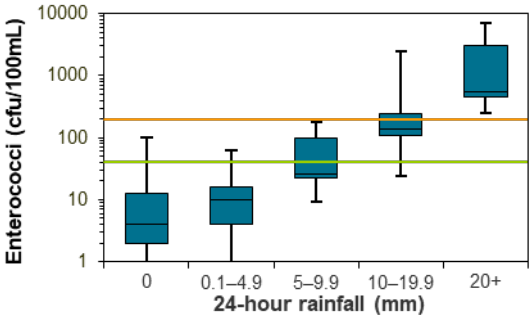
Microbial Assessment Category: B



Dry and wet weather water quality



Water quality in response to rainfall



Carss Point Baths

Beach grade: G

See ‘How to read this report’ for key to map.

Carss Point Baths is a netted swimming enclosure on the western shore of Kogarah Bay in the lower Georges River.

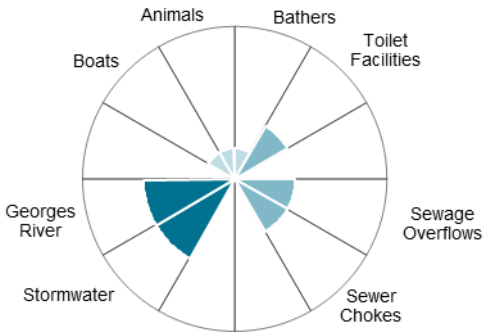
The Beach Suitability Grade of Good indicates microbial water quality is considered suitable for swimming most of the time but may be susceptible to pollution after rain, with several potential sources of faecal contamination including upstream sources in the Georges River and stormwater.

Enterococci levels increased with increasing rainfall, occasionally exceeding the safe swimming limit after no rain, and often after rainfall.

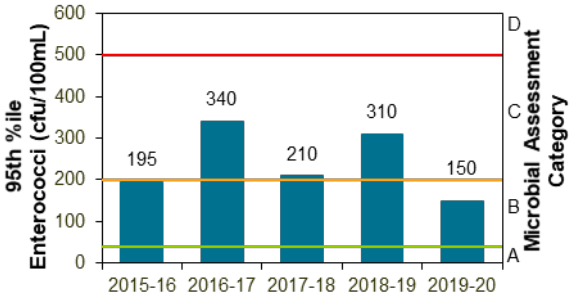
The site has been monitored since 1994.

Site type	Assessment period	Dry weather samples suitable for swimming	Water samples	Beach grade status
Estuarine	Oct 2017 to Apr 2020	86%	100	Improved ↑

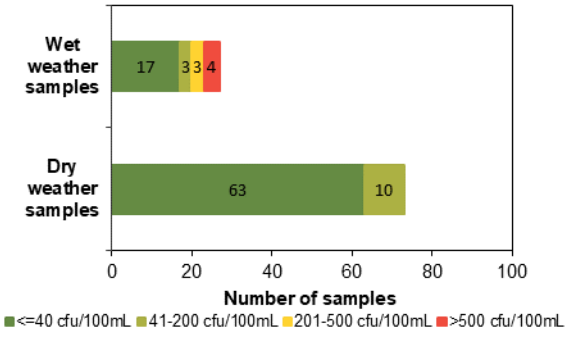
Sanitary inspection: Moderate



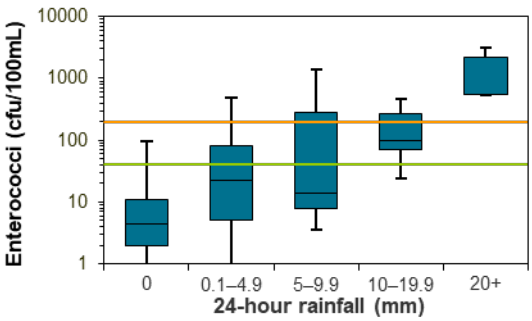
Microbial Assessment Category: B



Dry and wet weather water quality



Water quality in response to rainfall



Sandringham Baths

Beach grade: G

See ‘How to read this report’ for key to map.

Sandringham Baths is a netted swimming area near the mouth of the Georges River and is backed by a small beach.

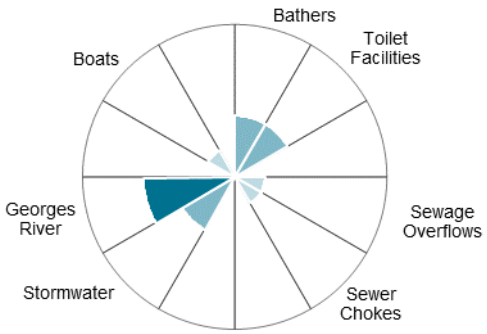
The Beach Suitability Grade of Good indicates microbial water quality is considered suitable for swimming most of the time but may be susceptible to pollution after rain, with several potential sources of faecal contamination including discharge from the Georges River.

Enterococci levels increased slightly with increasing rainfall, often exceeding the safe swimming limit after 5 mm or more of rain, and frequently after 20 mm or more.

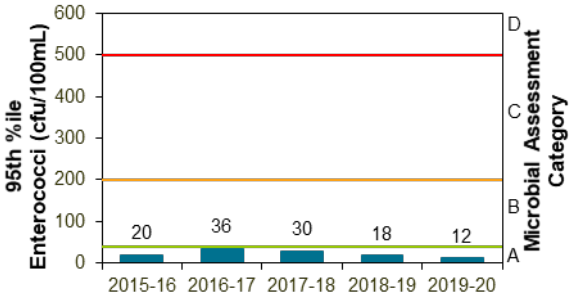
The site has been monitored since 1994.

Site type	Assessment period	Dry weather samples suitable for swimming	Water samples	Beach grade status
Estuarine	Oct 2017 to Apr 2020	100%	100	Stable

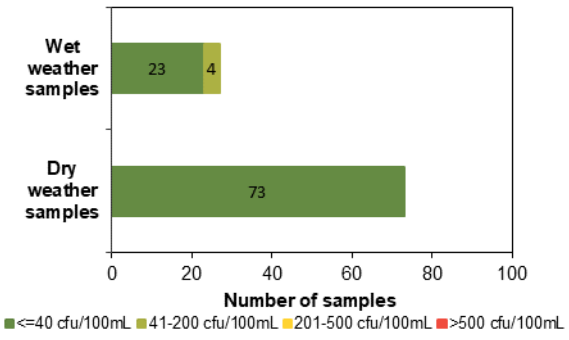
Sanitary inspection: Moderate



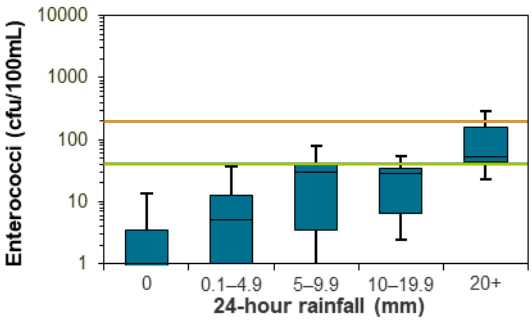
Microbial Assessment Category: A



Dry and wet weather water quality



Water quality in response to rainfall



Dolls Point Baths

Beach grade: G

See ‘How to read this report’ for key to map.

Dolls Point Baths is a netted swimming area with a sandy beach at the southern end of Lady Robinsons Beach in Botany Bay.

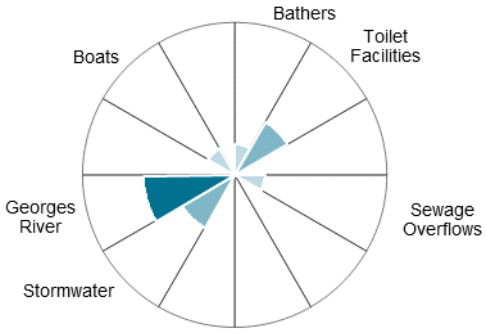
The Beach Suitability Grade of Good indicates microbial water quality is considered suitable for swimming most of the time but may be susceptible to pollution after rain, with several potential sources of faecal contamination including discharge from the Georges River.

Enterococci levels increased with increasing rainfall, occasionally exceeding the safe swimming limit after little or no rain, and often after 5 mm or more.

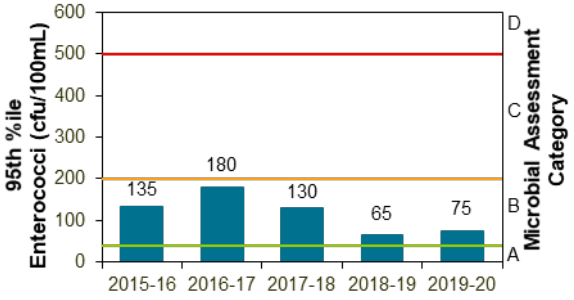
The site has been monitored since 1994.

Site type	Assessment period	Dry weather samples suitable for swimming	Water samples	Beach grade status
Estuarine	Oct 2017 to Apr 2020	92%	100	Stable

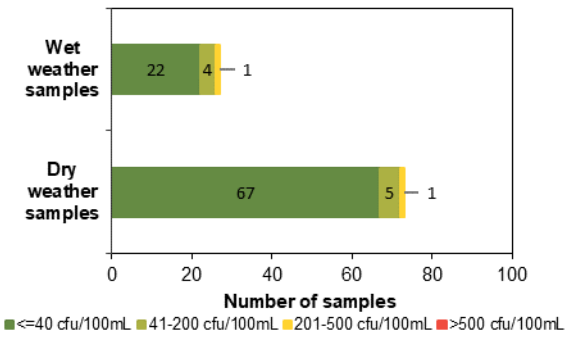
Sanitary inspection: Moderate



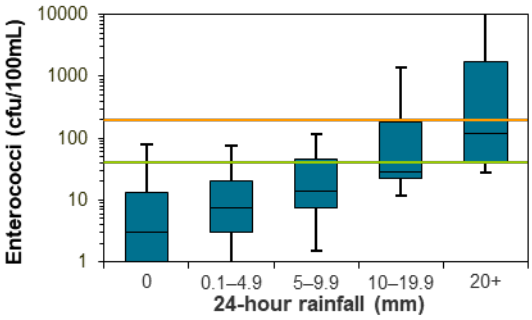
Microbial Assessment Category: B



Dry and wet weather water quality



Water quality in response to rainfall



Ramsgate Baths

Beach grade: G

See 'How to read this report' for key to map.

Ramsgate Baths is a netted swimming enclosure with a sandy beach near the southern end of Lady Robinsons Beach in Botany Bay.

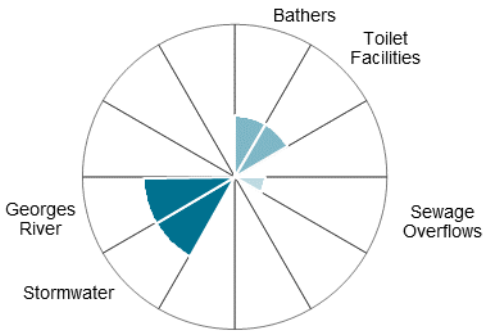
The Beach Suitability Grade of Good indicates microbial water quality is considered suitable for swimming most of the time but can be susceptible to pollution after rain, with several potential sources of faecal contamination including discharge from the Georges River.

Enterococci levels increased with increasing rainfall, occasionally exceeding the safe swimming limit after light rain and often after 10 mm or more.

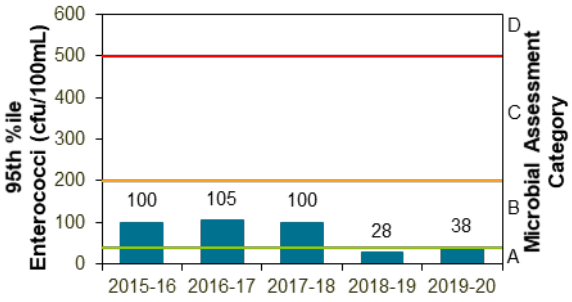
The site has been monitored since 1994.

Site type	Assessment period	Dry weather samples suitable for swimming	Water samples	Beach grade status
Estuarine	Oct 2017 to Apr 2020	92%	100	Stable

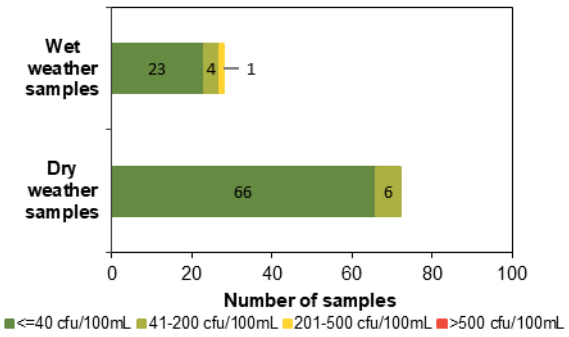
Sanitary inspection: Moderate



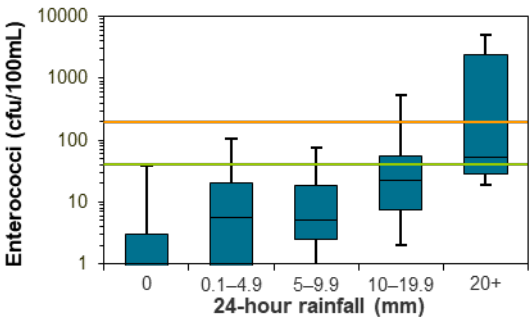
Microbial Assessment Category: A



Dry and wet weather water quality



Water quality in response to rainfall



Monterey Baths

Beach grade: G

See ‘How to read this report’ for key to map.

Monterey Baths is a netted swimming area with a sandy beach located toward the southern end of Lady Robinsons Beach.

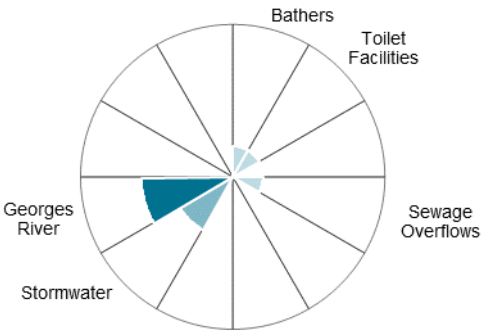
The Beach Suitability Grade of Good indicates microbial water quality is considered suitable for swimming most of the time but may be susceptible to pollution after rain, with several potential sources of faecal contamination including discharge from the Georges River and stormwater.

Enterococci levels increased with increasing rainfall, occasionally exceeding the safe swimming limit after little or no rain, and often after 5 mm or more.

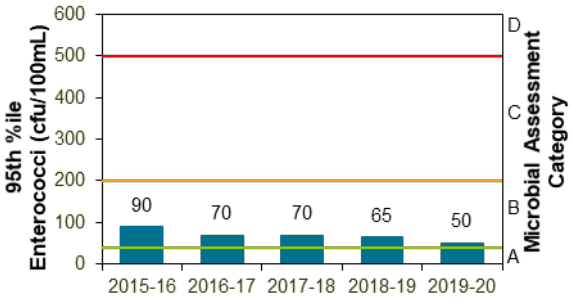
The site has been monitored since 1994.

Site type	Assessment period	Dry weather samples suitable for swimming	Water samples	Beach grade status
Estuarine	Oct 2017 to Apr 2020	90%	100	Stable

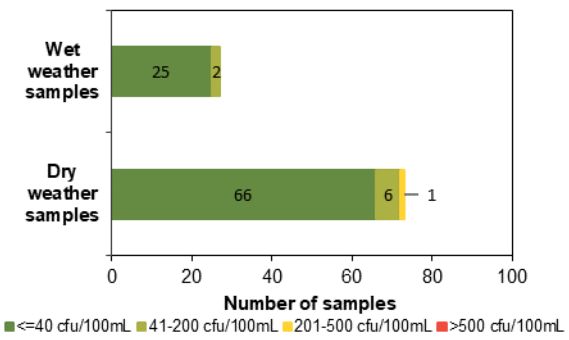
Sanitary inspection: Moderate



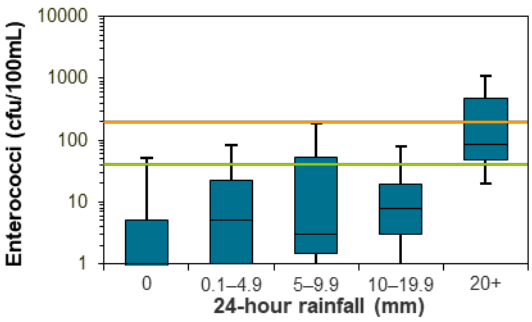
Microbial Assessment Category: B



Dry and wet weather water quality



Water quality in response to rainfall



Brighton-Le-Sands Baths

Beach grade: G

See ‘How to read this report’ for key to map.

Brighton-Le-Sands Baths is a netted swimming area at the centre of Lady Robinsons Beach in Botany Bay and is backed by a sandy beach.

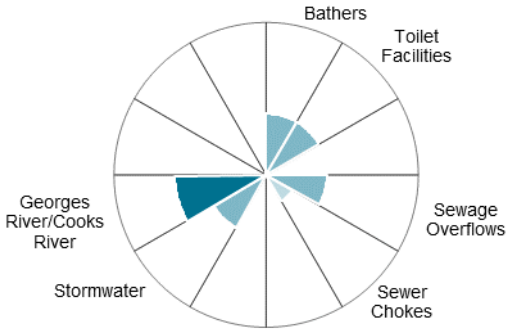
The Beach Suitability Grade of Good indicates microbial water quality is considered suitable for swimming most of the time but may be susceptible to pollution after rain, with several potential sources of faecal contamination including sewage overflows and river discharge.

Enterococci levels increased with increasing rainfall, occasionally exceeding the safe swimming limit after little or no rain, and often after 5 mm or more.

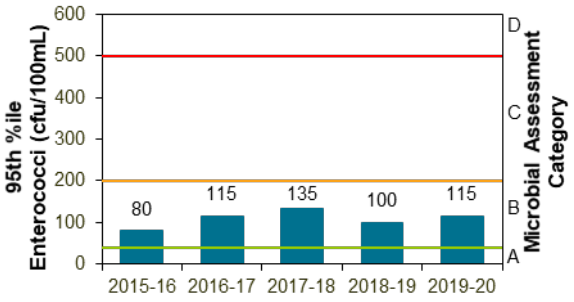
The site has been monitored since 1994.

Site type	Assessment period	Dry weather samples suitable for swimming	Water samples	Beach grade status
Estuarine	Oct 2017 to Apr 2020	89%	100	Stable

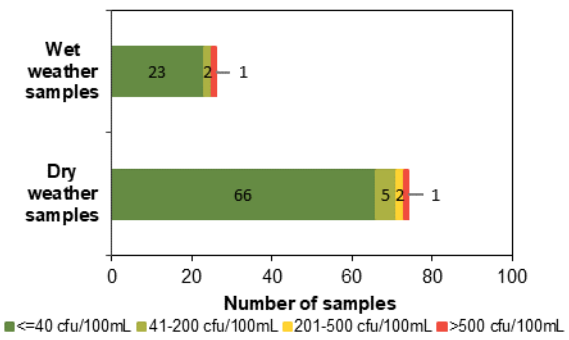
Sanitary inspection: Moderate



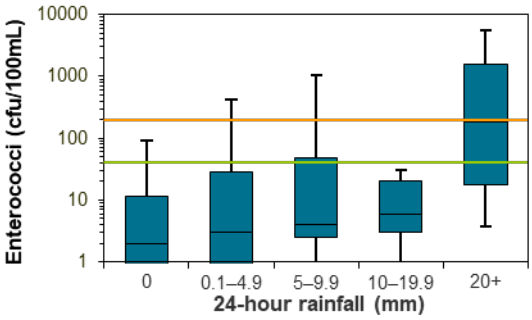
Microbial Assessment Category: B



Dry and wet weather water quality



Water quality in response to rainfall



Kyeemagh Baths

Beach grade: G

See ‘How to read this report’ for key to map.

Kyeemagh Baths is a netted swimming area with a sandy beach at the northern end of Lady Robinsons Beach, near the Cooks River mouth.

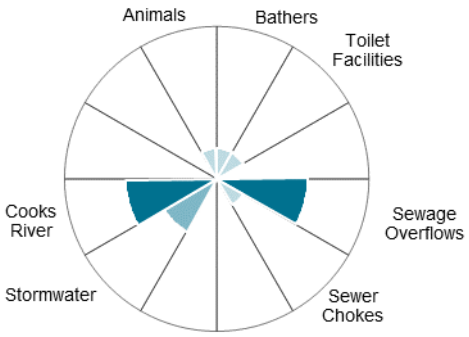
The Beach Suitability Grade of Good indicates microbial water quality is considered suitable for swimming most of the time but may be susceptible to pollution after rain, with several potential sources of faecal contamination including the discharge from the Cooks River and sewage overflows.

Enterococci levels increased with increasing rainfall, occasionally exceeding the safe swimming limit after little or no rain, and often after 5 mm or more.

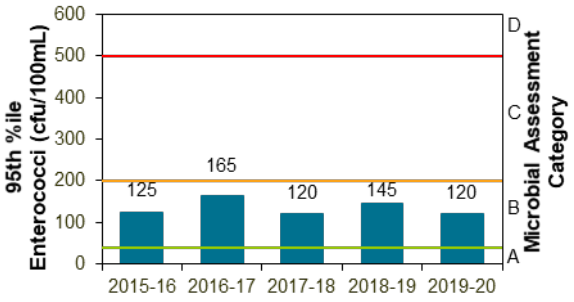
The site has been monitored since 1994.

Site type	Assessment period	Dry weather samples suitable for swimming	Water samples	Beach grade status
Estuarine	Oct 2017 to Apr 2020	88%	100	Stable

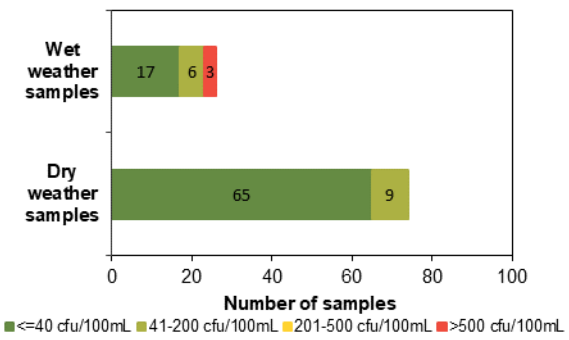
Sanitary inspection: Moderate



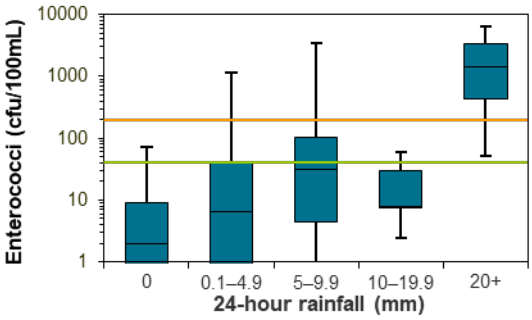
Microbial Assessment Category: B



Dry and wet weather water quality



Water quality in response to rainfall



Foreshores Beach

Beach grade: P

See ‘How to read this report’ for key to map.

Foreshores Beach is an unnetted sandy beach in Botany Bay. It is located near a boat ramp, and is adjacent to the Sydney Airport runway and Port Botany.

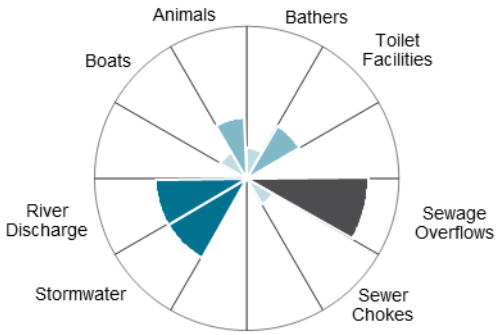
The Beach Suitability Grade of Poor indicates microbial water quality is susceptible to faecal pollution, particularly after rainfall and occasionally during dry weather conditions, with potential faecal contamination from several sources including sewage overflows that discharge into Mill Stream.

Enterococci levels increased with increasing rainfall, occasionally exceeding the safe swimming limit after no rain, and frequently after 5 mm or more.

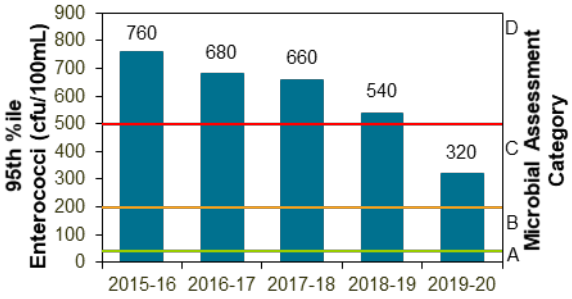
The site has been monitored since 1994.

Site type	Assessment period	Dry weather samples suitable for swimming	Water samples	Beach grade status
Estuarine	Oct 2017 to Apr 2020	84%	100	Improved

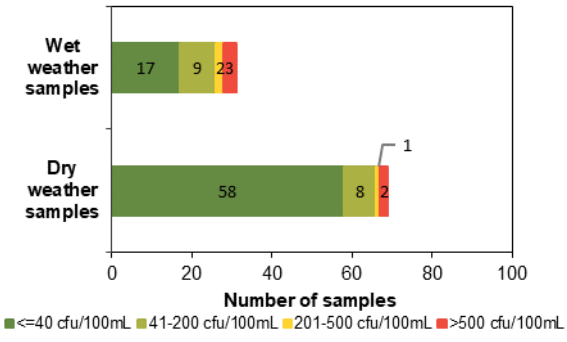
Sanitary inspection: High



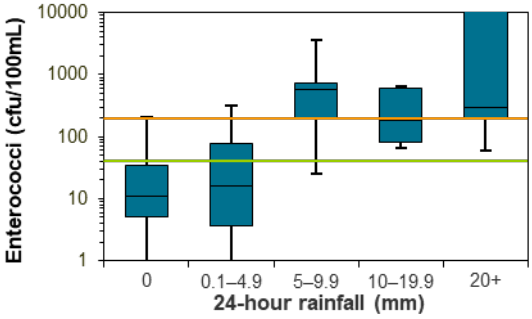
Microbial Assessment Category: C



Dry and wet weather water quality



Water quality in response to rainfall



Yarra Bay

Beach grade: G

See 'How to read this report' for key to map.

Yarra Bay is a 750 metre long sandy beach in Botany Bay. The swimming area is not netted and has a rock groyne at the southern end.

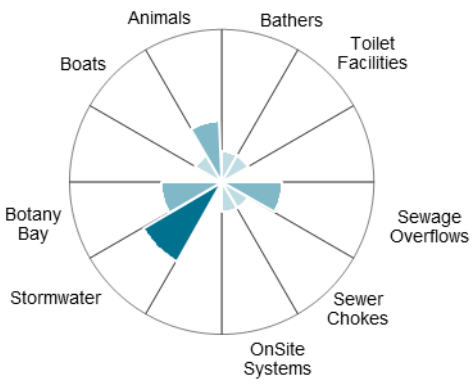
The Beach Suitability Grade of Good indicates microbial water quality is considered suitable for swimming most of the time but may be susceptible to pollution after rain, with several potential sources of faecal contamination including stormwater which ponds in the middle of the beach.

Enterococci levels increased with increasing rainfall, occasionally exceeding the safe swimming limit after no rain and often after light rainfall.

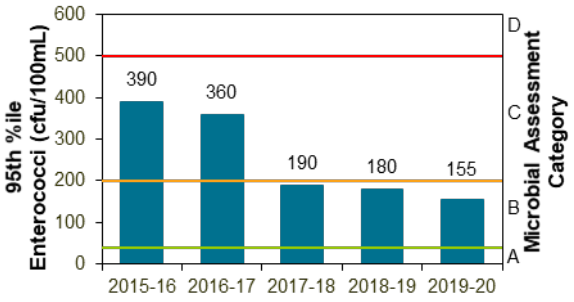
The site has been monitored since 1994.

Site type	Assessment period	Dry weather samples suitable for swimming	Water samples	Beach grade status
Estuarine	Oct 2017 to Apr 2020	88%	100	Stable

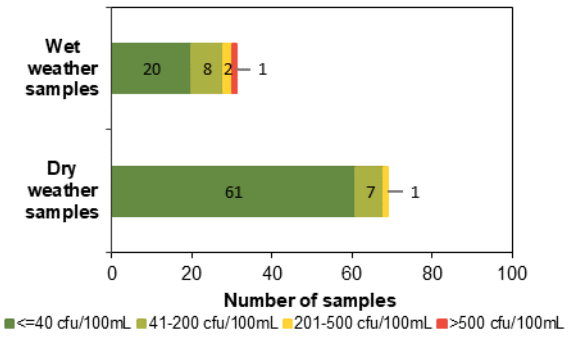
Sanitary inspection: Moderate



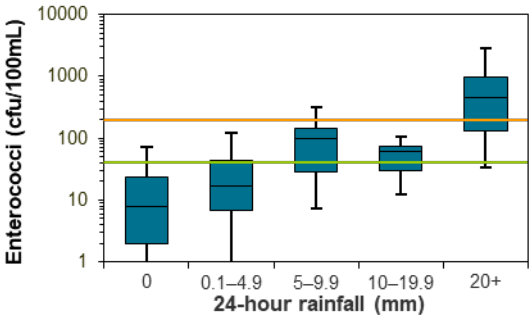
Microbial Assessment Category: B



Dry and wet weather water quality

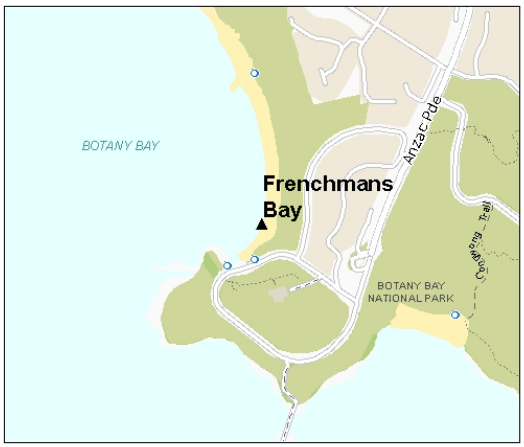


Water quality in response to rainfall



Frenchmans Bay

Beach grade: G



See ‘How to read this report’ for key to map.

Frenchmans Bay is a 500 metre long sandy beach in Botany Bay. The swimming area is not netted.

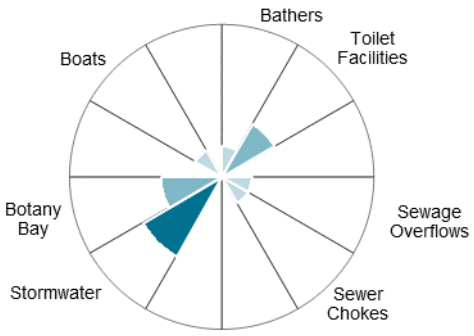
The Beach Suitability Grade of Good indicates microbial water quality is considered suitable for swimming most of the time but can be susceptible to pollution after rain, from several potential sources of faecal contamination including stormwater.

Enterococci levels increased with increasing rainfall, occasionally exceeding the safe swimming limit after little or no rain, and often after 5 mm or more.

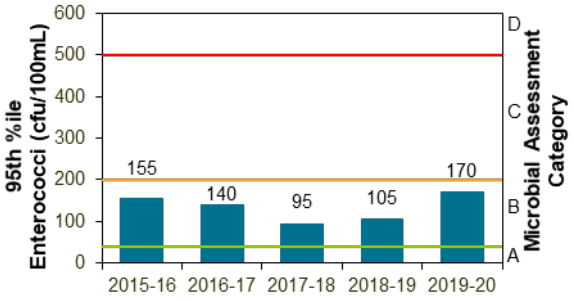
The site has been monitored since 1994.

Site type	Assessment period	Dry weather samples suitable for swimming	Water samples	Beach grade status
Estuarine	Oct 2017 to Apr 2020	80%	100	Stable

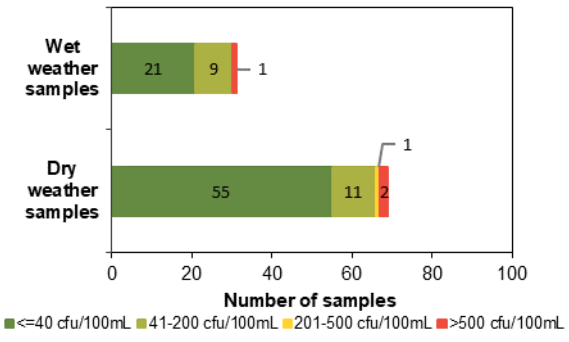
Sanitary inspection: Moderate



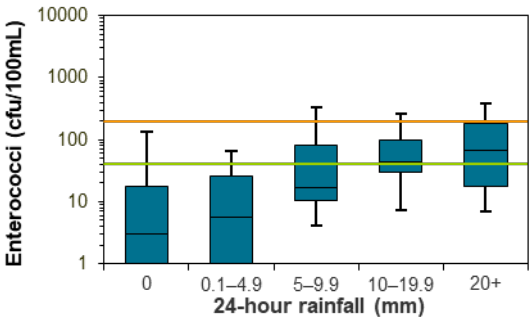
Microbial Assessment Category: B



Dry and wet weather water quality



Water quality in response to rainfall



Congwong Bay

Beach grade: G

See 'How to read this report' for key to map.

Congwong Bay is a 150 metre long beach near the mouth of Botany Bay. The swimming area is not netted.

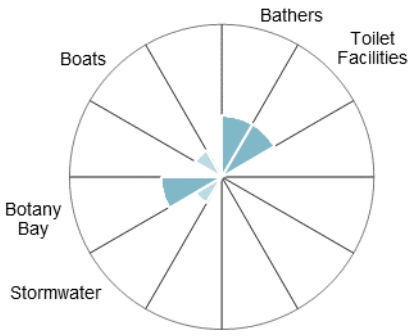
The Beach Suitability Grade of Good indicates microbial water quality is considered suitable for swimming most of the time but can be susceptible to pollution after rain, with several potential sources of minor faecal contamination.

Enterococci levels increased slightly with increasing rainfall, occasionally exceeding the safe swimming limit in response to little or no rain.

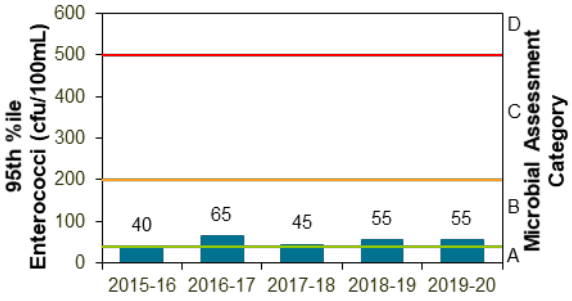
The site has been monitored since 1994.

Site type	Assessment period	Dry weather samples suitable for swimming	Water samples	Beach grade status
Estuarine	Jun 2018 to Apr 2020	92%	100	Stable

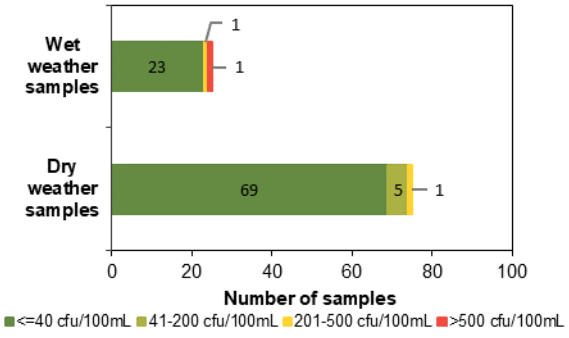
Sanitary inspection: Low



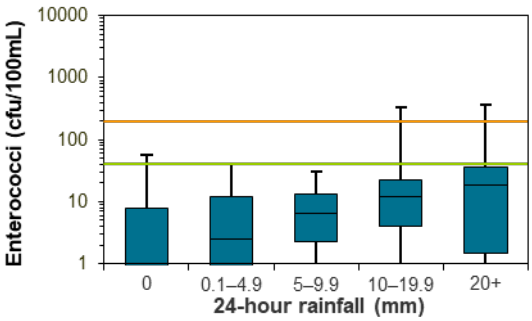
Microbial Assessment Category: B



Dry and wet weather water quality



Water quality in response to rainfall



Jibbon Beach

Beach grade: VG

See 'How to read this report' for key to map.

Jibbon Beach is located at the entrance to Port Hacking. The beach is backed by the Royal National Park and accessed from Bundeena.

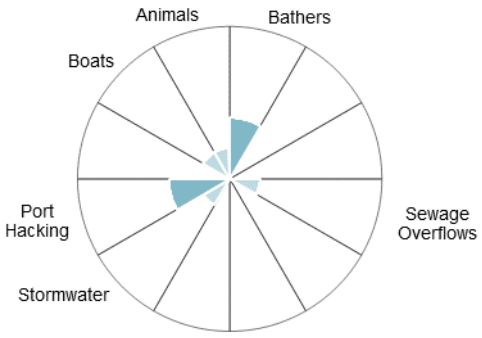
The Beach Suitability Grade of Very Good indicates microbial water quality is considered suitable for swimming almost all of the time, with few potential sources of significant faecal contamination.

Enterococci levels increased slightly with rainfall, occasionally exceeding the safe swimming limit in response to 5 mm or more of rain, and often after 20 mm or more.

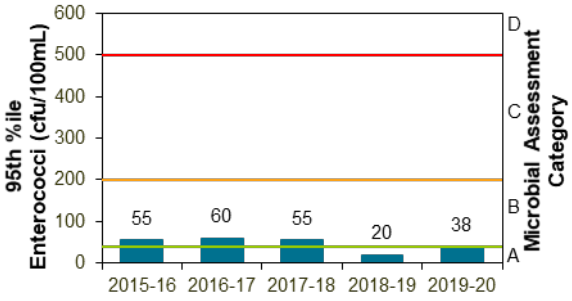
The site has been monitored since 1999.

Site type	Assessment period	Dry weather samples suitable for swimming	Water samples	Beach grade status
Estuarine	Oct 2017 to Apr 2020	96%	100	Stable

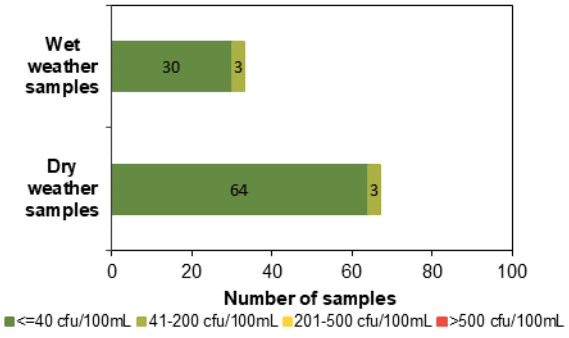
Sanitary inspection: Low



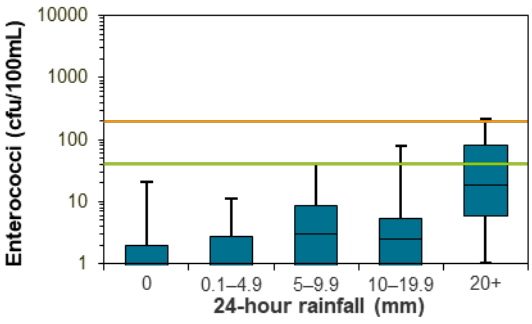
Microbial Assessment Category: A



Dry and wet weather water quality



Water quality in response to rainfall



Horderns Beach

Beach grade: G

See 'How to read this report' for key to map.

Horderns Beach is located on the southern shore of Port Hacking and is backed by the town of Bundeena.

The Beach Suitability Grade of Good indicates microbial water quality is considered suitable for swimming most of the time but may be susceptible to pollution after rain, with several potential sources of faecal contamination including Bundeena Creek.

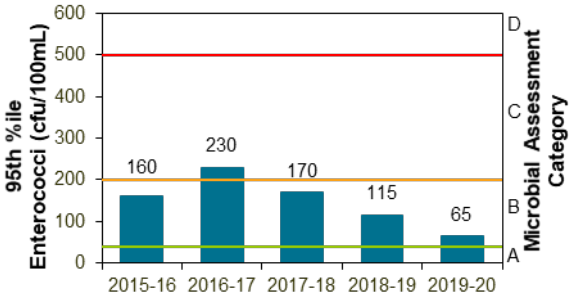
Enterococci levels increased with increasing rainfall, occasionally exceeding the safe swimming limit after little or no rain, and often after 5 mm or more.

The site has been monitored since 1999.

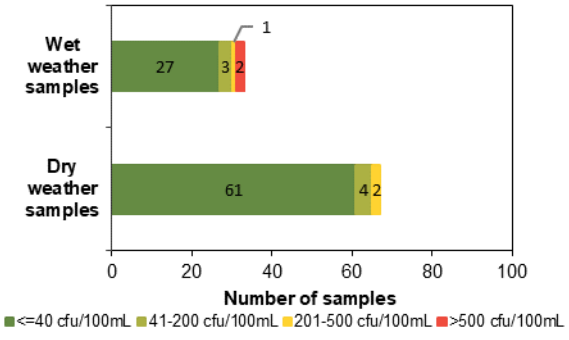
Site type	Assessment period	Dry weather samples suitable for swimming	Water samples	Beach grade status
Estuarine	Oct 2017 to Apr 2020	91%	100	Stable

Sanitary inspection: Moderate

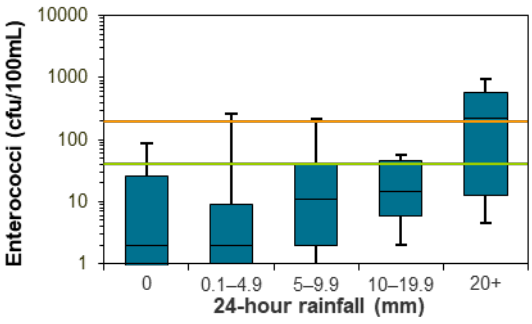
Microbial Assessment Category: B



Dry and wet weather water quality



Water quality in response to rainfall



Gymea Bay Baths

Beach grade: F

See ‘How to read this report’ for key to map.

Gymea Bay Baths is an enclosed tidal swimming area backed by a narrow sandy beach in the upper reaches of Port Hacking.

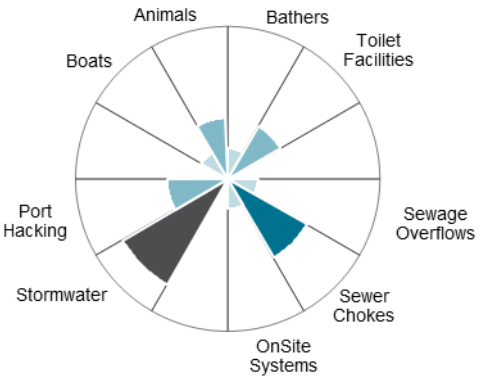
The Beach Suitability Grade of Fair indicates microbial water quality is occasionally susceptible to faecal pollution, usually triggered by rainfall, with several potential sources of faecal contamination including stormwater.

Enterococci levels increased with increasing rainfall, occasionally exceeding the safe swimming limit after no rain, and often after 5 mm or more.

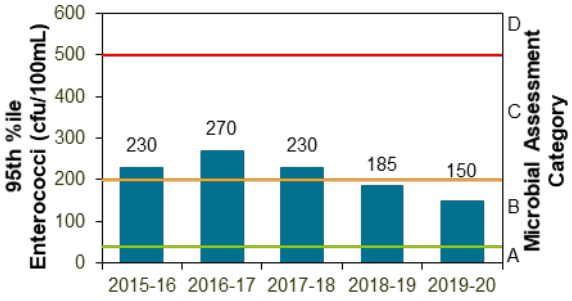
The site has been monitored since 1999.

Site type	Assessment period	Dry weather samples suitable for swimming	Water samples	Beach grade status
Estuarine	Oct 2017 to Apr 2020	94%	100	Stable

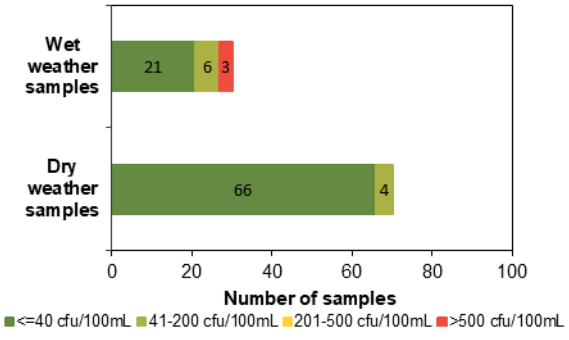
Sanitary inspection: High



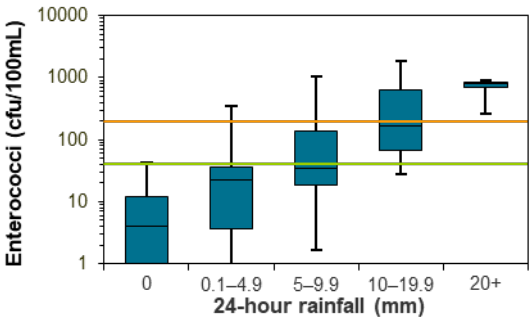
Microbial Assessment Category: B



Dry and wet weather water quality

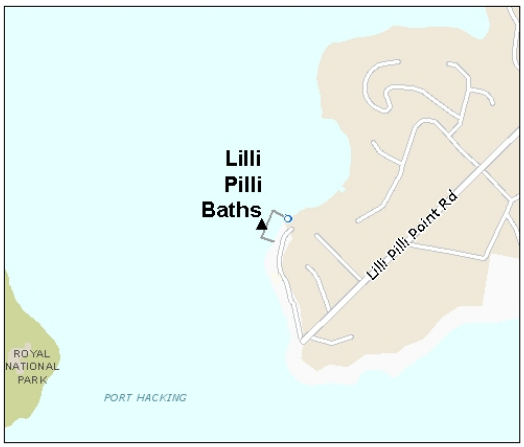


Water quality in response to rainfall



Lilli Pilli Baths

Beach grade: G



See ‘How to read this report’ for key to map.

Lilli Pilli Baths is a netted tidal swimming area on the western side of Lilli Pilli Point in Port Hacking.

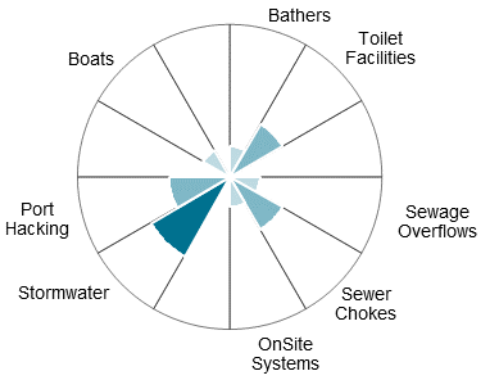
The Beach Suitability Grade of Good indicates microbial water quality is considered suitable for swimming most of the time but may be susceptible to pollution after rain, with several potential sources of faecal contamination including stormwater.

Enterococci levels increased with increasing rainfall, occasionally exceeding the safe swimming limit after light rain and often after 10 mm or more.

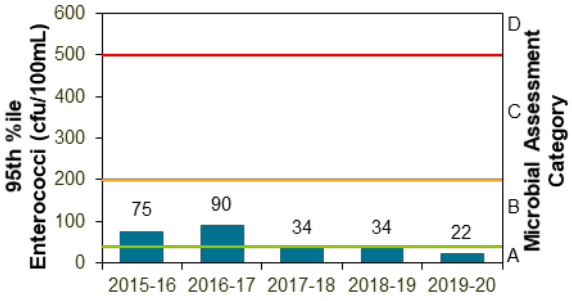
The site has been monitored since 1999.

Site type	Assessment period	Dry weather samples suitable for swimming	Water samples	Beach grade status
Estuarine	Oct 2017 to Apr 2020	99%	100	Stable

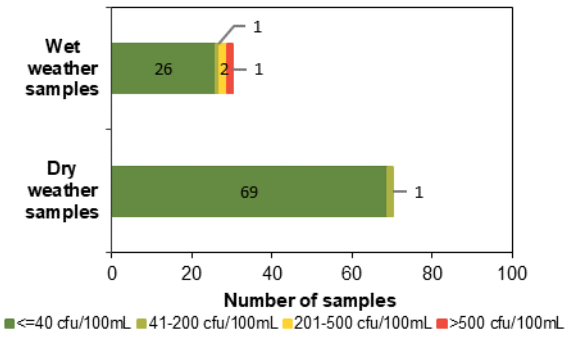
Sanitary inspection: Moderate



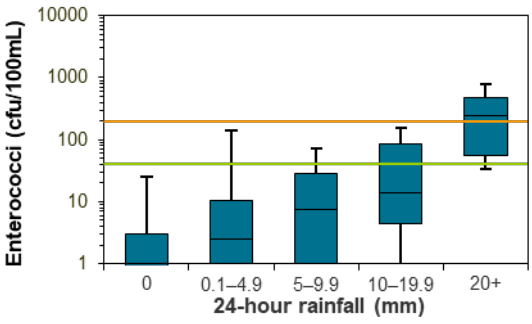
Microbial Assessment Category: A



Dry and wet weather water quality

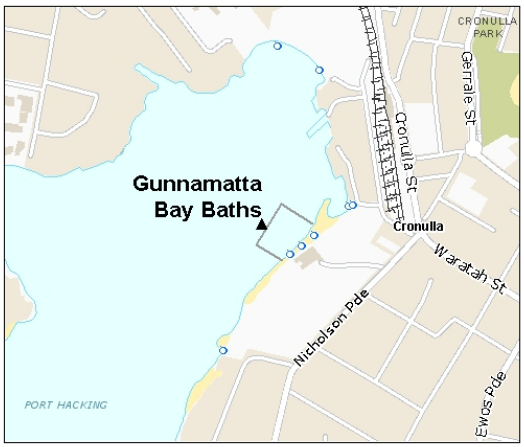


Water quality in response to rainfall



Gunnamatta Bay Baths

Beach grade: G



See ‘How to read this report’ for key to map.

Gunnamatta Bay Baths is a netted tidal swimming area in the lower reaches of Port Hacking and is backed by a narrow beach.

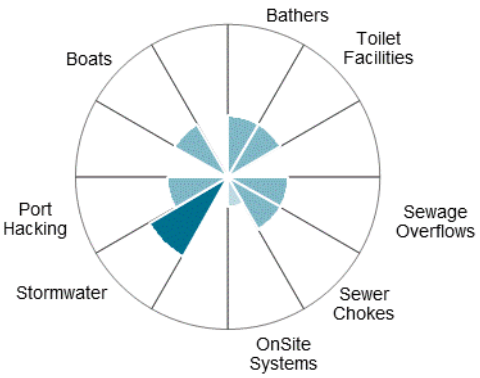
The Beach Suitability Grade of Good indicates microbial water quality is considered suitable for swimming most of the time but may be susceptible to pollution after rain, with several potential sources of faecal contamination including stormwater.

Enterococci levels increased with increasing rainfall, occasionally exceeding the safe swimming limit after little or no rain and often after 5 mm or more.

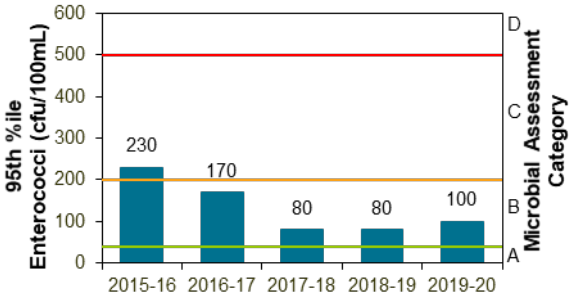
The site has been monitored since 1994.

Site type	Assessment period	Dry weather samples suitable for swimming	Water samples	Beach grade status
Estuarine	Oct 2017 to Apr 2020	93%	100	Stable

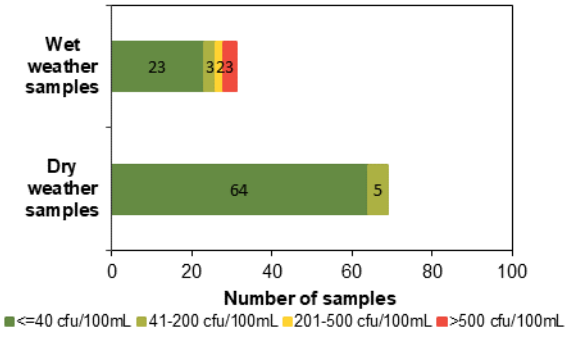
Sanitary inspection: Moderate



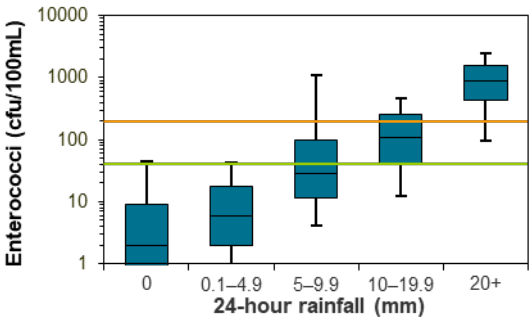
Microbial Assessment Category: B



Dry and wet weather water quality



Water quality in response to rainfall



How to read this report

Beach Suitability Grades

Beach Suitability Grades provide an assessment of the suitability of a swimming location for recreation over time and are based on a combination of sanitary inspection (identification and rating of potential pollution sources at a beach) and microbial assessment (water quality measurements gathered over previous years). There are five grades ranging from Very Good to Very Poor:

VG **Very Good**

Location has generally excellent microbial water quality and very few potential sources of faecal pollution. Water is considered suitable for swimming almost all of the time

G **Good**

Location has generally good microbial water quality and water is considered suitable for swimming most of the time. Swimming should be avoided during and for up to one day following heavy rain at ocean beaches and up to three days at estuarine sites

F **Fair**

Microbial water quality is generally suitable for swimming, but because of the presence of significant sources of faecal contamination, extra care should be taken to avoid swimming during and for up to three days following rainfall or if there are signs of pollution such as discoloured water or odour or debris in the water

P **Poor**

Location is susceptible to faecal pollution and microbial water quality is not always suitable for swimming. During dry weather conditions, ensure that the swimming location is free of signs of pollution, such as discoloured water, odour or debris in the water, and avoid swimming at all times during and for up to three days following rainfall

VP **Very Poor**

Location is very susceptible to faecal pollution and microbial water quality may often be unsuitable for swimming. It is generally recommended to avoid swimming at these sites almost all of the time

Some of the Beach Suitability Grades in this report are **provisional**, as the information required for the analysis is incomplete due to limited bacterial data or limited information on potential pollution sources in a beach catchment.

The guidelines

The National Health and Medical Research Council's *Guidelines for managing risks in recreational water*[1] were adopted for use in New South Wales in May 2009. These guidelines have been adopted in all Australian states and territories and are supported by guidance notes developed by the Department of Health Western Australia[2].

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[1]NHMRC 2008, *Guidelines for managing risks in recreational water*, National Health and Medical Research Council, Australian Government Publishing Service, Canberra, ACT.

[2]Department of Health, Western Australia 2007, *Microbial quality of recreational water guidance notes in support of chapter 5 of the National Health and Medical Research Council guidelines for managing risks in recreational water, 2006*, Department of Health, Western Australia and The University of Western Australia, October 2007, available at ww2.health.wa.gov.au/Articles/A_E/Environmental-waters-publications, accessed on 10/06/20.

Enterococci

The national guidelines advocate the use of enterococci as the single preferred faecal indicator in marine waters.

These bacteria are excreted in faeces and are rarely present in unpolluted waters. Enterococci have shown a clear dose–response relationship to disease outcomes in marine waters in the northern hemisphere. In accordance with the guidelines, Beachwatch tests for enterococci only. The enterococci density in water samples is analysed in the laboratory using method AS/NZS 4276.9:2007.

AS/NZS 4276.9:2007, *Water microbiology Method 9: Enterococci – Membrane filtration method (ISO 7899-2:2000, MOD)*, Standards Australia International Ltd, Sydney and Standards New Zealand, Wellington.

Enterococci are measured in colony forming units per 100 mL of sample (cfu/100 mL).

Beach Suitability Grades are determined by using the following matrix:

		Microbial Assessment Category			
		A	B	C	D
Sanitary Inspection Category	Very Low	Very Good	Very Good	Follow Up	Follow Up
	Low	Very Good	Good	Follow Up	Follow Up
	Moderate	Good	Good	Poor	Poor
	High	Good	Fair	Poor	Very Poor
	Very High	Follow Up	Fair	Poor	Very Poor

Using the Beach Suitability Grade classification matrix, sites assigned a moderate Sanitary Inspection Category can only be rated as Good or Poor, with no option of Fair grades. This can create the impression of a large change in water quality when in fact there need only be a slight increase in bacterial counts to push it over the threshold, with no significant increase in the risk to public health.

Microbial Assessment Category (MAC)

There are four Microbial Assessment Categories (A to D) and these are determined from the 95th percentile of an enterococci dataset of at least 100 data points. Each MAC is associated with a risk of illness determined from epidemiological studies. The risks of illness shown below are not those associated with a single data point but are the overall risk of illness associated with an enterococci dataset with that 95th percentile[1].

Risk of illness associated with Microbial Assessment Categories

Category	Enterococci (cfu/100 mL)	Illness risk*
A	≤40	GI illness risk: <1% AFR illness risk: <0.3%
B	41–200	GI illness risk: 1–5% AFR illness risk: 0.3–1.9%
C	201–500	GI illness risk: >5–10% AFR illness risk: >1.9–3.9%
D	>500	GI illness risk: >10% AFR illness risk: >3.9%

* GI = gastrointestinal illness; AFR = acute fever and rash

Calculating the MAC

The 95th percentile is a useful statistic for summarising the distribution of enterococci data at a site. It embodies elements of both the location of the distribution (how high/low the enterococci counts are) and the scale of the distribution (how variable the enterococci counts are).

The 95th percentile values for each of the four Microbial Assessment Categories were determined by the World Health Organization using enterococci data collected from swimming locations across Europe. These values will represent different probabilities of illness if the distribution of enterococci data from swimming locations in New South Wales differs from the European distribution.

[1] Wyer MD, Kay D, Fleisher JM, Salmon RL, Jones F, Godfree AF, Jackson G and Rogers A 1999, An experimental health related classification for marine waters, *Water Research*, vol.33(3), pp.715–722.

In recognition of this issue, Dr Richard Lugg (Department of Health, Western Australia) has developed a Microsoft® Excel tool for calculating a modified 95th percentile that takes into account the distribution of data. This tool has been used to calculate the 95th percentile values presented in this report and has been adopted for use by other state governments in Australia.

The tool can be downloaded from the WA Government's Environmental waters publications webpage, under *Forms and templates* [accessed 10/06/20].

Sanitary Inspection Category (SIC)

More information about the **sanitary inspection** process is available on the DPIE webpage:

Sanitary inspection of beaches

The aim of a sanitary inspection is to identify all sources of faecal contamination that could affect a swimming location and assess the risk to public health posed by these sources. It is an assessment of the likelihood of bacterial contamination from identified pollution sources and should, to some degree, correlate with the bacterial water quality results obtained from sampling.

The main sources of faecal contamination considered in the sanitary inspection are: bathers, toilet facilities, wastewater treatment plants (WWTPs), sewage overflows, sewer chokes, onsite systems, wastewater re-use, stormwater, river discharge, lagoons, boats and animals.

Rivers, lakes and estuaries themselves can be potential sources of faecal contamination to sites located in these waterbodies, with contaminated water from upstream or surrounding areas impacting water quality at the swimming location. This source is captured in river discharge or lagoon category, and shown as the waterbody in the sanitary inspection charts.

Through the sanitary inspection process, beaches are categorised to reflect the overall likelihood of faecal contamination. There are five categories: Very Low, Low, Moderate, High and Very High.

Stormwater at Coogee Beach
Photo: Beachwatch/EES, DPIE

Stormwater in urban areas often contains sewage from leakages, overflows or sewer chokes when the sewerage system fails.

Sewage overflows can occur in wet weather when the network has exceeded capacity due to rainwater entering the system. The mix of sewage and rainwater discharges from designated overflow points and drains to waterways, usually via the stormwater system. Overflows from the sewerage system can also occur in dry weather due to mechanical failure or power outage.

Sewer chokes occur due to blockages in the pipes usually due to tree roots, oil, grease or debris. This causes sewage to back up and escape via sewer inspection points, designed overflow structures or cracks in the pipes, then drain to waterways, usually via the stormwater system.

Explanation of tables

Each region contains tables listing all monitored swimming sites including site type, beach grade and change in grade from the previous year.

The following symbols are used to show the change in beach grade from the previous year:

- Stable
- Improved
- Declined

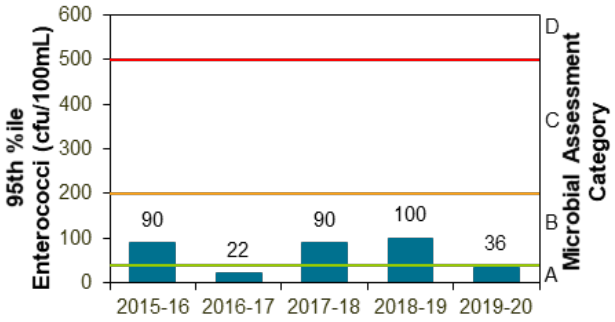
A provisional grade indicates the assessment is based on limited data collected during the assessment period and should not be compared to the beach grade from the previous year.

Explanation of graphs, charts, and information bars on beach pages

Microbial Assessment Category (MAC) chart

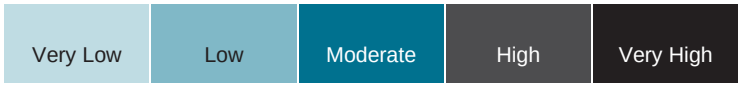
On each beach page, the MACs for the last five years are displayed on a simple bar chart. The MAC for the current year is based on enterococci data collected during the assessment period. The bars are labelled with the 95th percentile value for each year and the thresholds dividing the

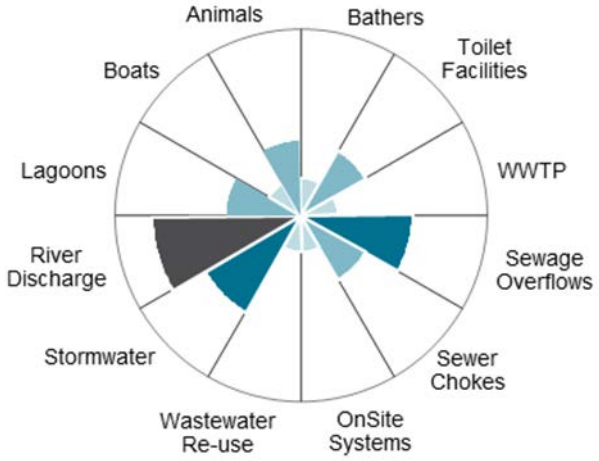
A, B, C and D categories are marked in green, amber and red for reference.



Sanitary Inspection Category (SIC) chart

The results of the sanitary inspection for each swimming location are presented in a radar pie chart. The chart shows the likelihood that each identified pollution source will contribute to faecal contamination at a swimming site, as indicated by the size and colour of the segment, ranging from very low (lightest colour) to very high (darkest colour) as shown below. The sum of these contributions is the overall likelihood, or Sanitary Inspection Category.

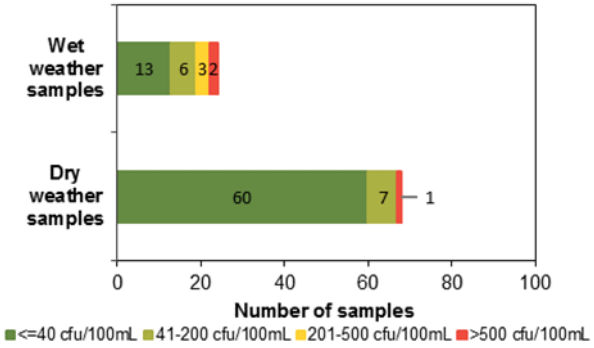




Wet and dry weather water quality chart

Enterococci levels in wet and dry weather conditions are presented for each swimming location as a bar graph. All data collected during the assessment period is included in the analysis. Dry weather is defined as no rainfall recorded in the previous 24 hours. Each bar is colour coded to show the number of enterococci results up to 40 cfu/100 mL, between 41 and 200 cfu/100 mL, between 201 and 500 cfu/100 mL

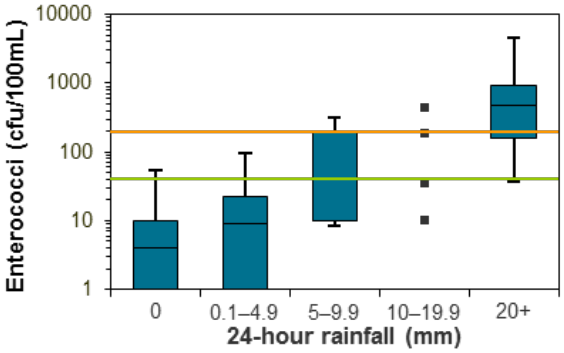
and greater than 500 cfu/100 mL. These categories reflect the Microbial Assessment Category thresholds and are coloured on the graph as dark green, light green, amber and red respectively.



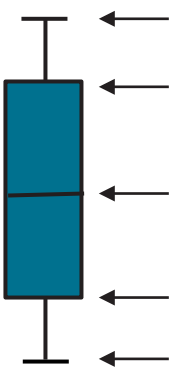
It is expected that swimming sites with lower levels of flushing will show some elevated bacterial results in dry weather samples (no rainfall in the previous 24 hours) due to the longer time needed to recover from a rainfall event. At some estuarine and lake/lagoon swimming locations the impacts of stormwater pollution on beach water quality may be detected up to three days after rainfall.

Water quality in response to rainfall

Trends in enterococci levels in response to rainfall are shown using a box plot. For reference, enterococci levels of 40 cfu/100 mL and 200 cfu/100 mL are indicated with a green and orange line, respectively. The 40 cfu/100 mL level is referred to as the ‘safe swimming limit’. The enterococci data were obtained from the last five years of monitoring. Rainfall data were obtained from rain gauges situated close to the sample site and are 24-hour totals to 9am on the day of sampling. If there are fewer than five enterococci data points in a rainfall category, individual data points are presented instead of a box plot. At sites where many results are below the detection limit (1 cfu/100 mL), only the upper portion of the box plots will be visible.



Each part of the box plot represents a significant percentile value of the sample population:



95% of the samples lie below the top whisker

75% of the samples lie below the top of the box

half the samples are on each side of the middle line of the box (median or 50%ile)

25% of the samples lie below the bottom of the box

5% of the samples lie below the bottom whisker.

Information bars

Information bars on each beach page provide a summary of details about the swimming site.

The **assessment period** shows the timeframe in which the water samples were collected. The NHMRC guidelines state beach grades should be determined from the most recent 100 water quality results collected within a five-year period. The assessment period varies between sites depending on sampling frequency.

Dry weather samples suitable for swimming (**dry weather swimmability**) shows the percentage of water samples with enterococci levels below 40 cfu/100 mL. Dry weather is defined as no rainfall in the previous 24 hours. Swimming sites with lower levels of flushing often have a lower percentage of dry weather samples within the safe swimming limit due to the impacts of rainfall detected up to three days after the event.

Explanation of maps

A map of individual swimming locations is presented on each beach page. The scale of the maps is 1:10,000. Each map shows the location of the sampling site, land use and features such as surf lifesaving clubs. Potential pollution sources such as stormwater drains, sewage pumping stations, wastewater treatment plants, lagoons, rivers and creeks, are shown where accurate data is held.