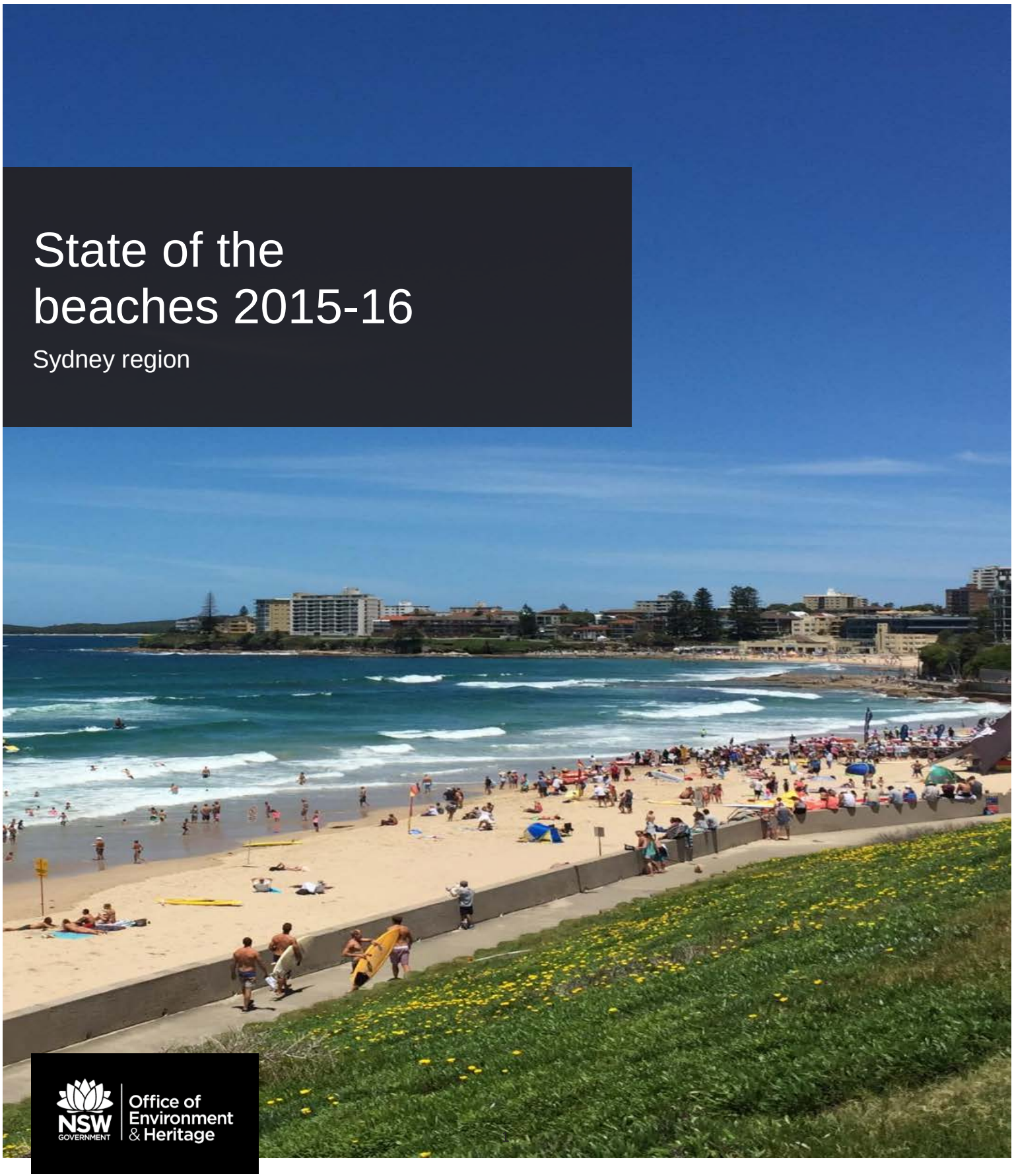
Beachwatch

State of the beaches 2015-16

Sydney region



NSW GOVERNMENT Office of Environment & Heritage

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Sydney region

SUMMARY 2015–2016

Beach monitoring in New South Wales

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.

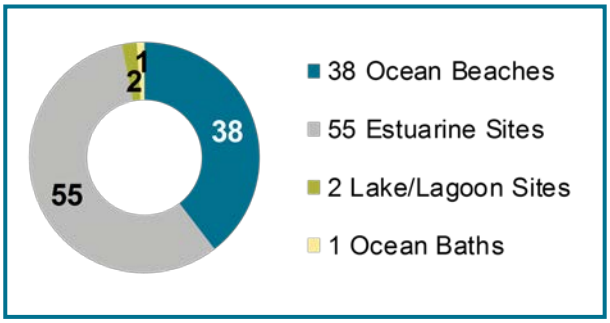
Swimming sites in New South Wales are graded as Very Good, Good, Fair, Poor or Very Poor in accordance with the National Health and Medical Research Council's 2008 *Guidelines for Managing Risks in Recreational Waters*. These Beach Suitability Grades provide a long-term assessment of how suitable a beach 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.

A guide on to how to read the report is provided on pages 120–123.

Statistics for 2015–2016:

96 sites

19 councils



Rainfall impacts

Rainfall is the major driver of pollution to recreational waters, generating stormwater runoff and triggering 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 2015–2016 are based on water quality data collected over the last two to four years. Rainfall over this period has been diverse, beginning with sustained wet weather, then very dry conditions and a return to wet weather with several heavy rain events and severe thunderstorms:

- 2012–2013: high levels of rainfall recorded in many areas
- 2013–2014: driest summer in almost 30 years
- 2014–2015: above average rainfall, particularly on the coast.
- 2015–2016: variable with significant rainfall events.

Severe thunderstorms in November and December 2015 caused heavy rain across the city. Wet conditions continued in January which was the wettest for Sydney since 1988, with several severe thunderstorms causing heavy rain and flash flooding. An east coast low caused heavy rainfall in early January with a three-day total of 239mm at Frenchs Forest. The highest total rainfall for January was in Mona Vale with 348mm of rainfall recorded. In contrast, February was dry with only one day recording heavy rain. Wet conditions returned in March and April with above average rainfall recorded. This included 94mm on 4 April of which 80mm fell in just three hours, while Randwick also recorded 95mm in an isolated storm on 21 March.

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 the threat of 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 Sydney region

Sydney region (Northern)		Site type	Beach suitability grade	Change
Northern Beaches	Palm Beach	Ocean beach	VG	Stable
	Whale Beach	Ocean beach	VG	Stable
	Avalon Beach	Ocean beach	VG	Stable
	Bilgola Beach	Ocean beach	VG	Stable
	Newport Beach	Ocean beach	G	Stable
	Bungan Beach	Ocean beach	VG	Stable
	Mona Vale Beach	Ocean beach	VG	Stable
	Warriewood Beach	Ocean beach	G	Stable
	Turimetta Beach	Ocean beach	G	Stable
	North Narrabeen Beach	Ocean beach	G	Stable
	Narrabeen Lagoon	Lagoon	P	Deteriorated
	Bilarong Reserve	Lagoon	P	Stable
	Collaroy Beach	Ocean beach	G	Stable
	Long Reef Beach	Ocean beach	G	Stable
	Dee Why Beach	Ocean beach	VG	Stable
	North Curl Curl Beach	Ocean beach	G	Stable
	South Curl Curl Beach	Ocean beach	VG	Stable
	Freshwater Beach	Ocean beach	G	Stable
	Queenscliff Beach	Ocean beach	G	Stable
	North Steyne Beach	Ocean beach	G	Stable
	South Steyne Beach	Ocean beach	G	Stable
	Shelly Beach	Ocean beach	G	Deteriorated
Pittwater	Barrenjoey Beach	Estuarine	P	Deteriorated
	Paradise Beach Baths	Estuarine	G	Stable
	Clareville Beach	Estuarine	G	Stable
	Taylors Point Baths	Estuarine	G	Stable
	Bayview Baths	Estuarine	P	Stable
	Elvina Bay	Estuarine	VG	Improved
	North Scotland Island	Estuarine	G	Stable
	South Scotland Island	Estuarine	G	Stable
	The Basin	Estuarine	VG	Stable
	Great Mackerel Beach	Estuarine	VG	Stable

VG Very Good G Good F Fair P Poor VP Very Poor

Sydney region (Central)		Site type	Beach suitability grade	Change
City Beaches	Bondi Beach	Ocean beach	G	Stable
	Tamarama Beach	Ocean beach	G	Stable
	Bronte Beach	Ocean beach	G	Stable
	Clovelly Beach	Ocean beach	VG	Stable
	Gordons Bay	Ocean beach	G	Stable
	Coogee Beach	Ocean beach	P	Deteriorated
	Maroubra Beach	Ocean beach	VG	Stable
	South Maroubra Beach	Ocean beach	G	Stable
	South Maroubra Rockpool	Ocean baths	G	Stable
	Malabar Beach	Ocean beach	P	Deteriorated
	Little Bay Beach	Ocean beach	G	Stable
Sydney Harbour	Watsons Bay	Estuarine	G	Stable
	Parsley Bay	Estuarine	G	Stable
	Nielsen Park	Estuarine	VG	Stable
	Rose Bay Beach	Estuarine	G	Stable
	Murray Rose Pool	Estuarine	G	Stable
	Dawn Fraser Pool	Estuarine	G	Stable
	Chiswick Baths	Estuarine	G	Stable
	Cabarita Beach	Estuarine	G	Stable
	Woolwich Baths	Estuarine	G	Stable
	Tambourine Bay	Estuarine	G	Improved
	Woodford Bay	Estuarine	G	Stable
	Greenwich Baths	Estuarine	G	Stable
	Hayes St Beach	Estuarine	G	Stable
	Clifton Gardens	Estuarine	G	Stable
	Balmoral Baths	Estuarine	G	Stable
	Edwards Beach	Estuarine	G	Stable
	Chinamans Beach	Estuarine	G	Stable
	Northbridge Baths	Estuarine	F	Stable
	Davidson Reserve	Estuarine	P	Stable
	Gurney Crescent Baths	Estuarine	F	Stable
	Clontarf Pool	Estuarine	F	Stable
	Forty Baskets Pool	Estuarine	G	Stable
	Fairlight Beach	Estuarine	G	Stable
	Manly Cove	Estuarine	G	Stable
	Little Manly Cove	Estuarine	G	Stable

VG Very Good G Good F Fair P Poor VP Very Poor

Sydney region (Southern)		Site type	Beach suitability grade	Change
Southern Beaches	Boat Harbour	Ocean beach	G	Improved
	Greenhills Beach	Ocean beach	VG	Stable
	Wanda Beach	Ocean beach	VG	Stable
	Elouera Beach	Ocean beach	VG	Stable
	North Cronulla Beach	Ocean beach	VG	Stable
	South Cronulla Beach	Ocean beach	G	Stable
	Shelly Beach	Ocean beach	VG	Stable
	Oak Park	Ocean beach	VG	Stable
Botany Bay and lower Georges River	Silver Beach	Estuarine	G	Stable
	Como Baths	Estuarine	G	Stable
	Jew Fish Bay Baths	Estuarine	G	Stable
	Oatley Bay Baths	Estuarine	G	Stable
	Carss Point Baths	Estuarine	G	Stable
	Sandringham Baths	Estuarine	G	Stable
	Dolls Point Baths	Estuarine	G	Stable
	Ramsgate Baths	Estuarine	G	Stable
	Monterey Baths	Estuarine	G	Stable
	Brighton-Le-Sands Baths	Estuarine	G	Stable
	Kyeemagh Baths	Estuarine	G	Stable
	Foreshores Beach	Estuarine	VP	Stable
	Yarra Bay	Estuarine	P	Deteriorated
	Frenchmans Bay	Estuarine	G	Stable
Port Hacking	Congwong Bay	Estuarine	VG	Stable
	Jibbon Beach	Estuarine	G	Deteriorated
	Horderns Beach	Estuarine	G	Stable
	Gymea Bay Baths	Estuarine	P	Deteriorated
	Lilli Pilli Baths	Estuarine	G	Stable
	Gunnamatta Bay Baths	Estuarine	P	Deteriorated

VG Very Good G Good F Fair P Poor VP Very Poor

Northern Sydney (Pittwater to Manly)

State of the Beaches 2015–2016

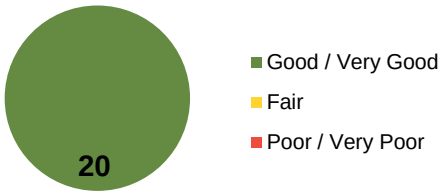
Overall results

Percentage of sites graded as Good or Very Good:

2012–13	2013–14	2014–15	2015–16
97%	97%	94%	88%

Twenty-eight of the 32 swimming sites were graded as Very Good or Good in 2015–2016. This was a fall in performance from the previous year, with wet weather, closure of Narrabeen Lagoon and significant storm events impacting water quality.

Ocean beaches

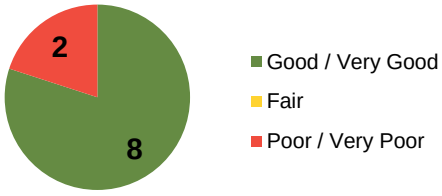


All 20 ocean beaches were graded as Very Good or Good.

Palm, Whale, Avalon, Bilgola, Bungan, Mona Vale, 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.

Newport, Warriewood, Turimetta, North Narrabeen, Collaroy, Long Reef, North Curl Curl, Freshwater, Queenscliff, North Steyne, South Steyne and Shelly (Manly) beaches were graded as Good. 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



Great Mackerel Beach, Elvina Bay and The Basin in Pittwater 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 a Good grade in 2014–2015.

Five of the 10 estuarine beaches in Pittwater were graded as Good: Paradise Beach Baths, Clareville Beach, Taylors Point Baths, North

Best beaches

Palm Beach, Whale Beach, Avalon Beach, Bilgola Beach, Bungan Beach, Mona Vale Beach, Dee Why Beach, South Curl Curl Beach, Elvina Bay, Great Mackeral Beach and **The Basin**

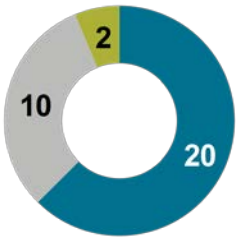
These sites had excellent water quality and were suitable for swimming almost all of the time.

32 sites

every 6 days*

1716 samples

year round*



* 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.

See **How to Read this Report** for explanations of graphs and Beach Suitability Grades.

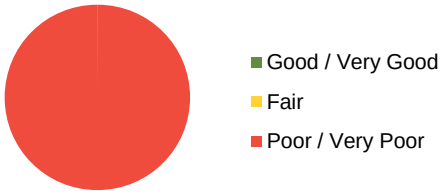
Scotland Island and South Scotland Island. The water quality at these locations was generally of a high standard, although elevated levels of enterococci were recorded at most locations following rainfall.

Bayview Baths was graded as Poor, as it was in the previous year. While the baths generally had good water quality during dry weather, elevated enterococci levels were regularly measured following low levels of rainfall. Despite the Poor grade, water quality showed some improvement with bacteria levels in 85% of all samples collected during 2015–2016 within the safe swimming limit, compared to 67% in the previous year.

Barrenjoey Beach was graded as Poor, downgraded from Good in 2014–2015. The site occasionally had slightly elevated levels of enterococci with little or no rainfall. Water quality has deteriorated since November 2014 when the sampling point was moved closer to the shoreline because access by boat was restricted due to shallow water and seagrass beds. Major works on sewerage infrastructure is being carried out in the area with NSW National Parks and Wildlife Service decommissioning septic tanks at the lighthouse and fishermen's cottages at the northern end of the beach and connecting their facilities to the reticulated sewerage system. It is expected water quality will improve once these upgrades are completed. Despite the Poor grade, only slightly elevated results were recorded at Barrenjoey Beach during 2015–2016 with all enterococci results below 200cfu/100ml and 73% of all samples within the safe swimming limit.

As a precaution, swimming should be avoided at Pittwater swimming sites during and for up to two days following heavy rainfall or if there are signs of stormwater pollution such as discoloured water or floating debris.

Lake/lagoon swimming sites



Two Narrabeen Lagoon swimming sites were graded as Poor.

The swimming location at the entrance to Narrabeen Lagoon (Birdwood Park) was graded as Poor, downgraded from Good in 2014–2015. Discharge from Narrabeen Lagoon is a significant source of faecal contamination. Microbial water quality at this site is dependent on wet weather events and whether the lagoon entrance is open to the ocean. When the entrance is open, the site is well flushed by clean ocean water and water quality is often of a high standard. During 2015–2016 the entrance of the lagoon was closed for extended periods which reduced the level of flushing and impacted water quality at this site. A large entrance clearance project is planned for August 2016 and it is expected that water quality will improve once it is completed. It is recommended that swimming be avoided during and following rainfall and when the lagoon entrance is closed.

Bilarong Reserve in Narrabeen Lagoon was added to the program in 2014 and continues to be graded as Poor. The water quality at this site was susceptible to pollution, particularly after rainfall and occasionally during dry weather conditions. Elevated levels of enterococci were recorded in 33% of samples during 2015–2016 with a significant source of faecal contamination from stormwater runoff to the lagoon. This swimming site is located away from the lagoon entrance so is not well flushed by clean ocean water. Swimming at this site should be avoided during and for up to three days following rainfall or if there are signs of stormwater pollution such as discoloured water or floating debris.

Management

Pittwater Council, Warringah Council and Manly Council amalgamated to form Northern Beaches Council on 12 May 2016 as part of the local government reforms. Management actions for the Northern Sydney region will be reported under the former councils to reflect the entities responsible for management actions during the 2015–2016 assessment period.

To reduce the incidence of wet weather sewage overflows in beach catchments between Narrabeen and Manly, Sydney Water increased the capacity of pipes and pumps and incorporated storage tanks into the sewerage system. An 18 million litre storage tank in the Brookvale industrial area to reduce overflows to Manly Lagoon and Curl Curl Lagoon was completed in 2013.

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.

NSW National Parks and Wildlife Service has decommissioned septic tanks at the lighthouse and fishermen's cottages at the northern end of Barrenjoey Beach and is connecting their facilities to the reticulated sewerage system. Works will be completed in July 2016.

Manly Council and Sydney Water have collaborated to do intense dry weather monitoring of stormwater drains to identify sewer leaks across the Manly area. Leaks from public sewers are repaired by Sydney Water and leaks from private sewers are addressed by the council.

In 2015, Manly Council significantly increased its cleanouts of stormwater quality improvement devices. Council removed 271.4 tonnes of sediment, litter and debris from stormwater quality improvement devices during 2015–2016. In addition, construction was completed of the Burnt Bridge Creek Sediment Pollution Basin at Manly West Park. The basin has the capacity to capture about 600 tonnes of sediment and attached pollution, such as heavy metals and nutrients. The construction allows for the polluted material to be cost-effectively removed, before it can enter Manly Lagoon. Other projects include the construction of a rain-garden for water treatment and community educational purposes at the council's Roundhouse Childcare Centre.

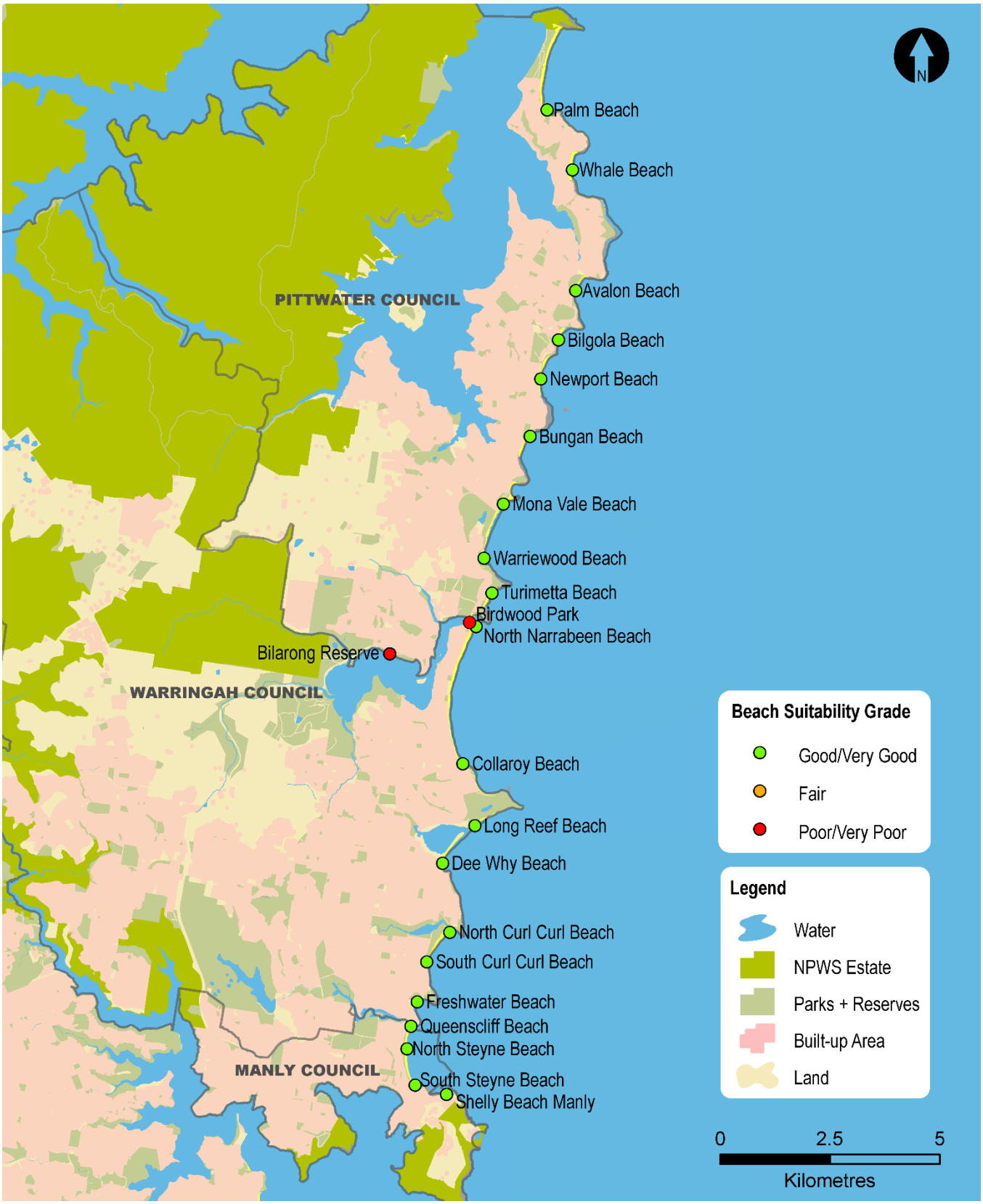
Warringah Council had a water management plan to improve the water quality of receiving water bodies. Stormwater quality improvement assets were constructed, including rain gardens in the Collaroy Basin, bioretention at Middle Creek and Collaroy Beach recreational area, and the Cromer Park Stormwater Harvesting Project. The Cromer Park Stormwater Harvesting Project re-uses stormwater, irrigating the park and reducing pollutants entering Dee Why Lagoon. Council improved stormwater water quality discharging from private developments via a water management policy.

Warringah Council installed a number of gross pollutant traps and water quality devices, including a bioswale adjacent to Dee Why Lagoon. On average, 1000 tonnes of sediment and 17 cubic metres of floating debris are removed from these devices each year. Warringah Council examined gross pollutant trap efficiencies and made improvements to maintenance regimes to ensure their effectiveness.

Warringah Council opened the entrance to Narrabeen Lagoon when water levels were at least one metre above mean sea level and there was significant rainfall occurring or forecast. The lagoon cannot be opened while water levels are low because the flow in from the ocean on high tide overcomes the outflow from the lagoon and closes it again. Even after a successful breakout, the lagoon can close up again quite quickly, particularly if there is still a lot of sand in the entrance (and depending on ocean and rainfall conditions). In November 2015, Council manually opened the lagoon at the approved water level in accordance with Council's procedures and the State Government license. Due to wave swell, rain conditions and the amount of sand in the area, the entrance naturally re-closed. The entrance was manually reopened again in January and March 2016.

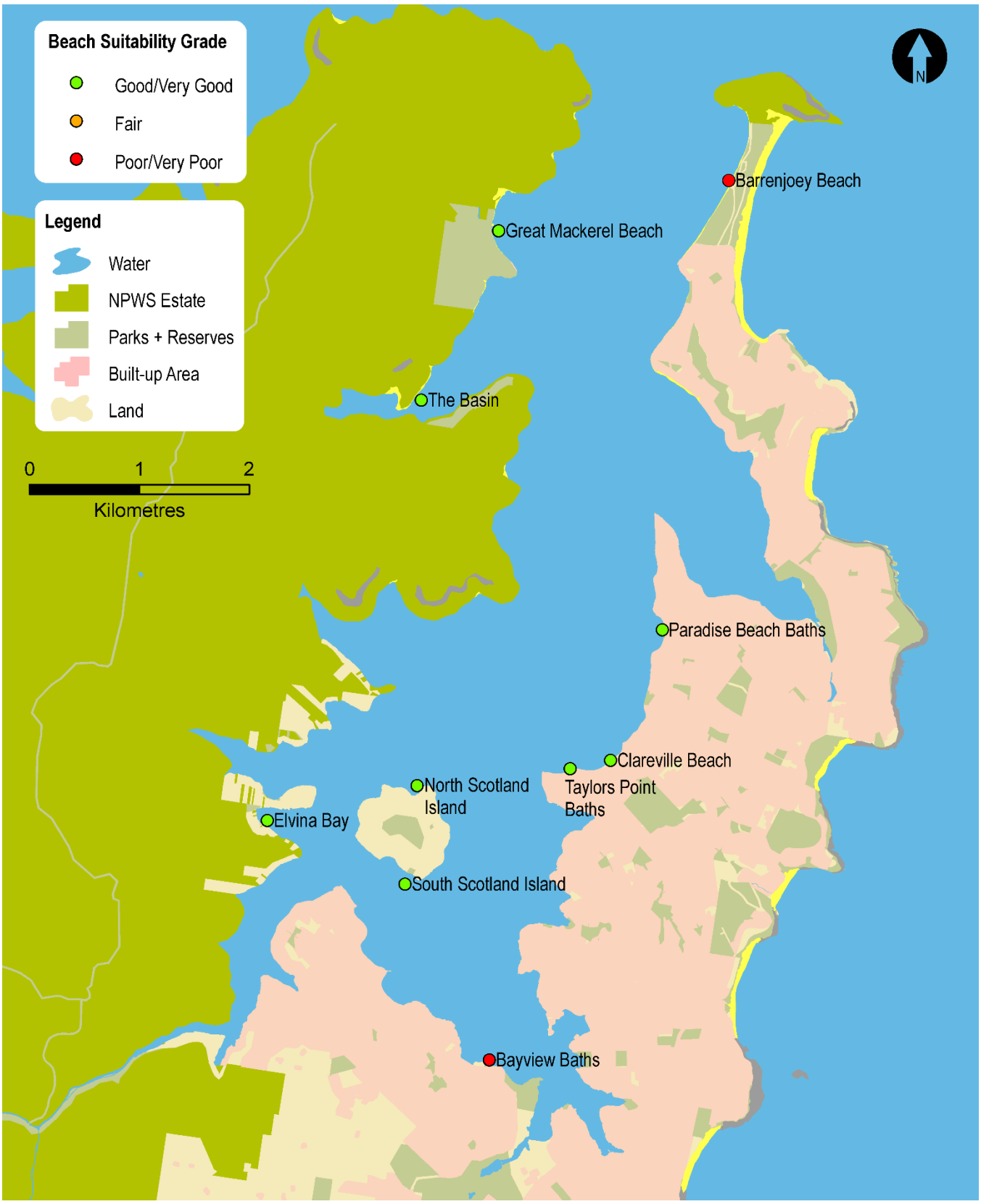
Warringah and Pittwater councils (now Northern Beaches Council) together with the State Government plan to do a large entrance clearance project in winter 2016 and will remove approximately 45,000 cubic metres of sand from the entrance of Narrabeen Lagoon. This is done about every four years and the sand is trucked down to Collaroy and Narrabeen beaches to address erosion and improve amenity.

Pittwater Council's Stormwater Management Service Charge has helped fund various stormwater management schemes and the construction and maintenance of stormwater quality improvement devices throughout the Pittwater area. Currently there are 53 stormwater quality improvement devices which prevent around 235 tonnes of sediment and floating debris from entering the waterways each year.



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

(Manly Council, Warringah Council and Pittwater Council amalgamated on 12 May 2016 to form Northern Beaches Council)



Sampling sites and Beach Suitability Grades in Pittwater

Palm Beach

Beach Suitability Grade: VG

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

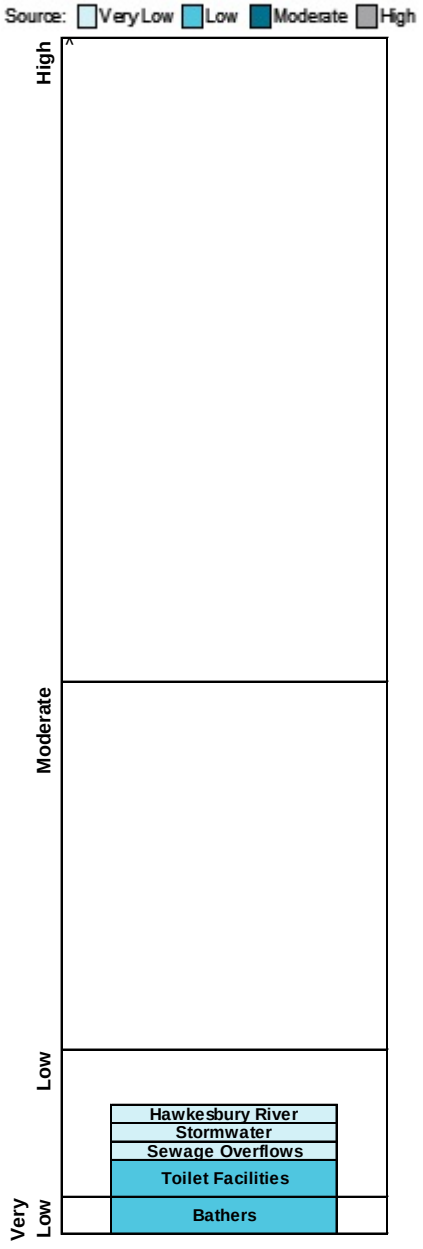
Palm Beach is 2.3 kilometres long, with rock baths in the southern corner. Samples are collected near the surf club at the southern end of the beach. Lifeguards patrol the beach from September to April.

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

The response to rainfall graph indicates that enterococci levels generally increased slightly with increasing rainfall, but mostly remained below the safe swimming limit across all rainfall categories.

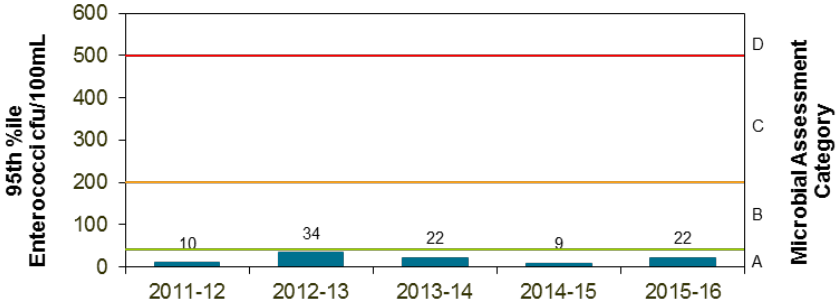
The site has been monitored since 1989. Water quality has generally been of a very high standard.

Sanitary Inspection: **Low**



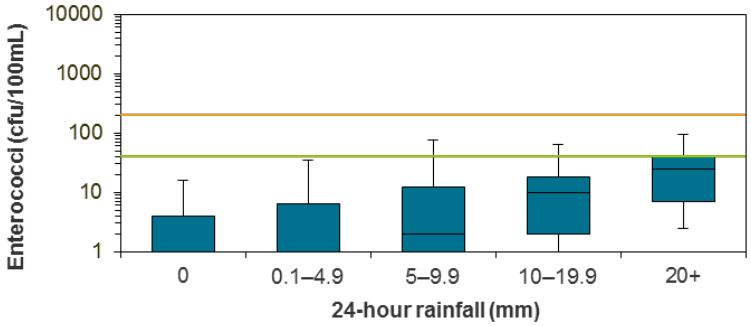
Microbial Assessment: **A**

Monitoring period for 2015–16 result is August 2014 to April 2016.

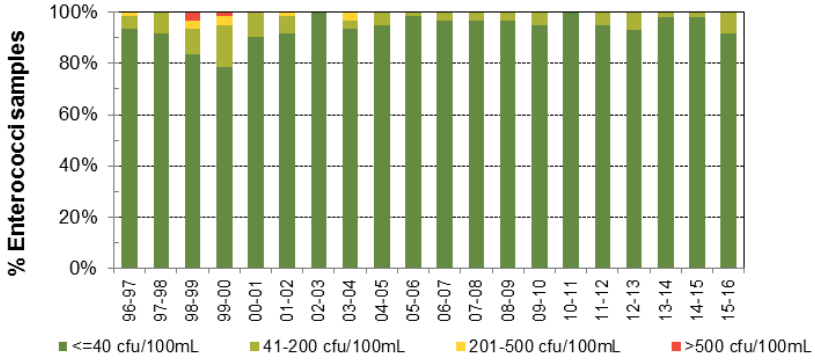


Response to rainfall

Rainfall from Avalon rain gauge

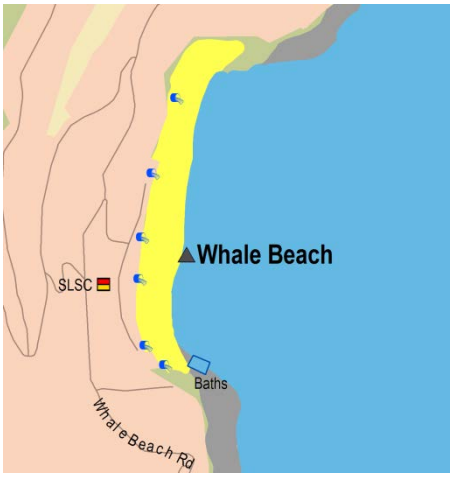


Trends in enterococci data through time



Whale Beach

Beach Suitability Grade: VG



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

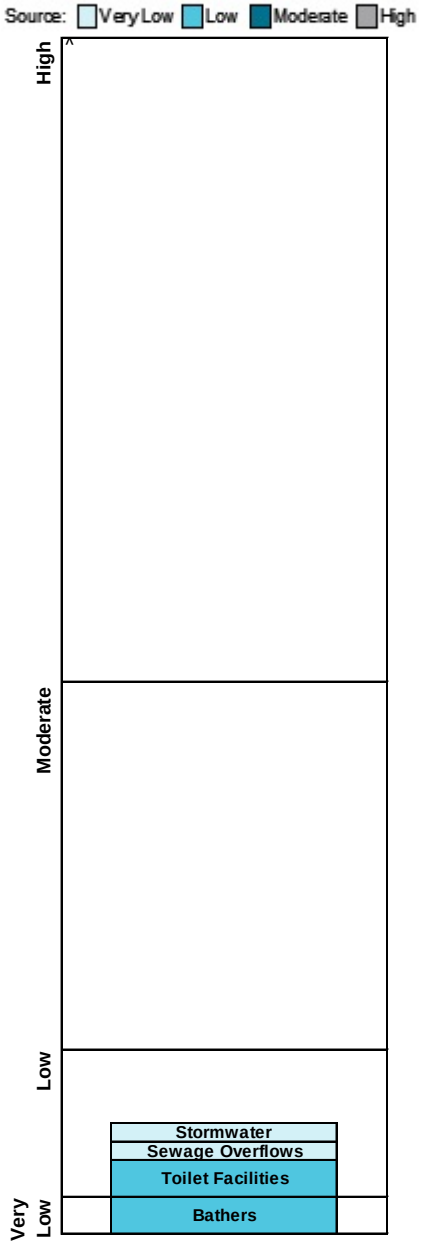
Whale Beach is 600 metres long, with rock baths located on the southern rock platform. Swimming is potentially hazardous because of persistent rips. Lifeguards patrol the beach from September to April.

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

The response to rainfall graph indicates that enterococci levels increased slightly with increasing rainfall, but mostly remained below the safe swimming limit across all rainfall categories.

The site has been monitored since 1989. Water quality has generally been of a very high standard.

Sanitary Inspection: **Low**



Microbial Assessment: **A**

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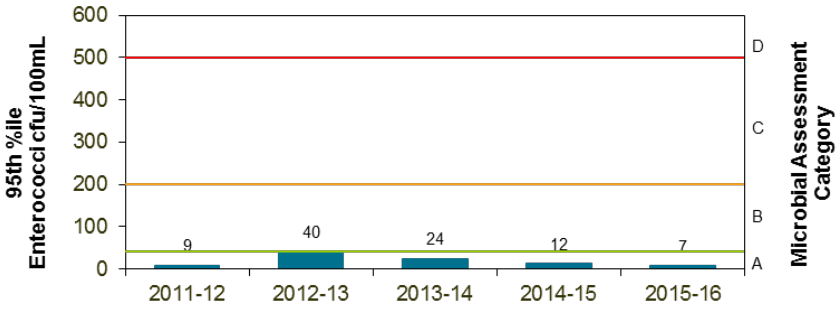
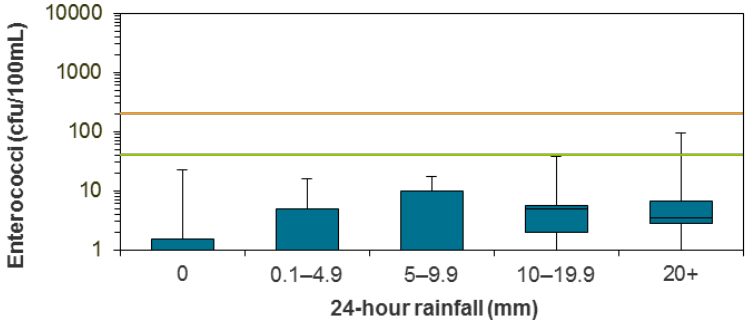
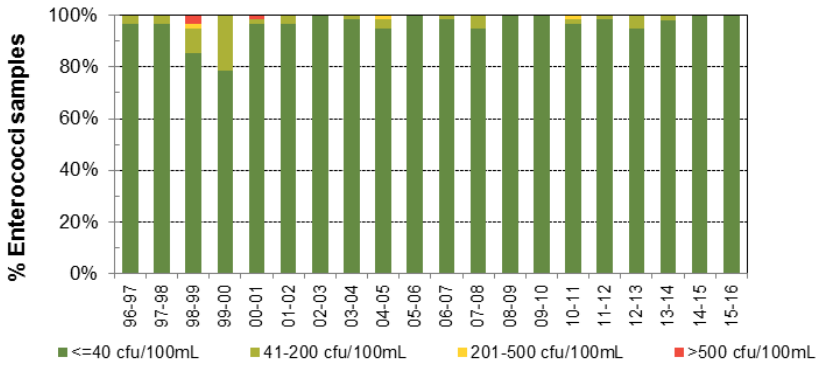


Response to rainfall

Rainfall from Avalon rain gauge



Trends in enterococci data through time



Avalon Beach

Beach Suitability Grade: VG

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

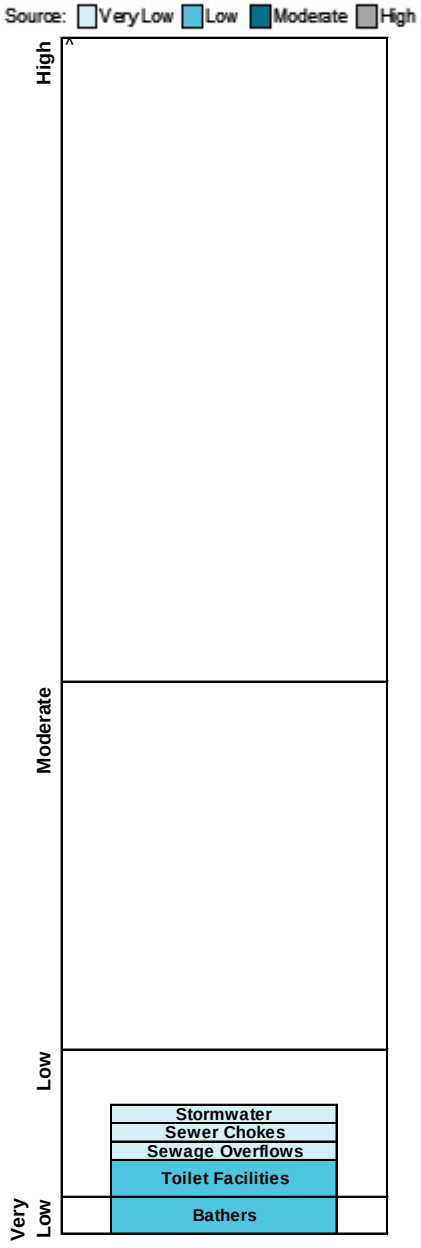
Avalon Beach is 500 metres long and backed by a park and picnic area. Swimming can be hazardous because of persistent rips. Lifeguards patrol the beach from September to April.

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

The response to rainfall graph indicates that enterococci levels increased slightly with increasing rainfall, but mostly remained below the safe swimming limit across all rainfall categories.

The site has been monitored since 1989. Water quality has generally been of a very high standard over the last 20 years.

Sanitary Inspection: **Low**



Microbial Assessment: **A**

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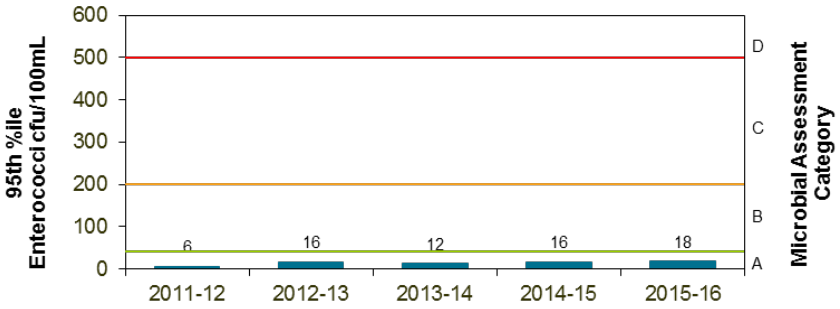
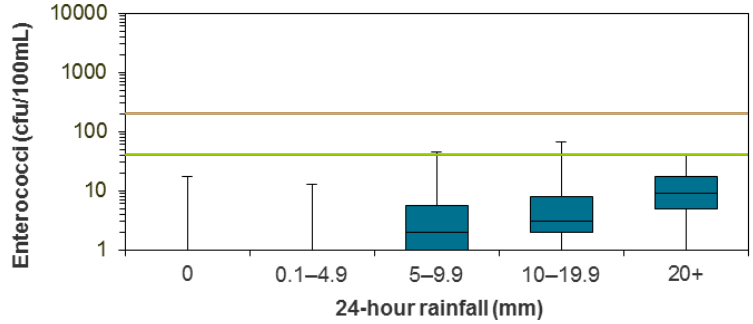
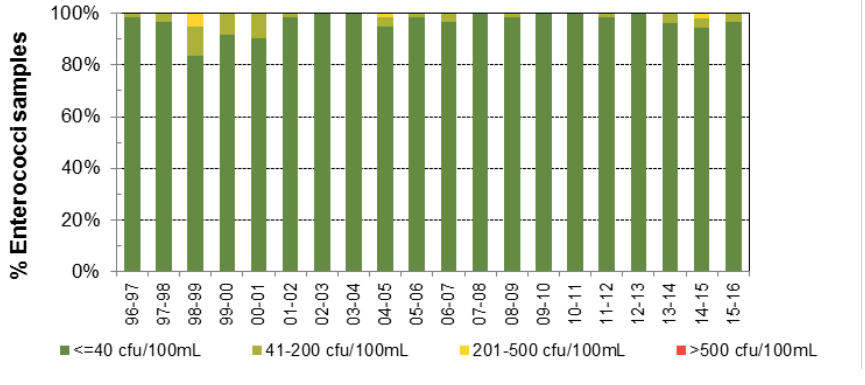


Response to rainfall

Rainfall from Avalon rain gauge



Trends in enterococci data through time



Bilgola Beach

Beach Suitability Grade: VG

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

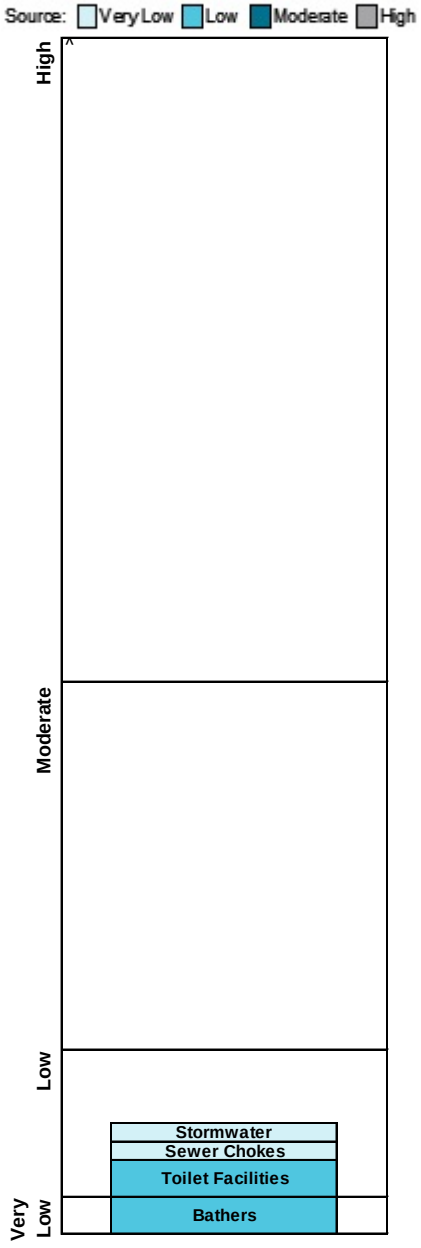
Bilgola Beach is 500 metres long, with rock baths located at the southern end. Swimming can be hazardous because of shifting and permanent rips. Lifeguards patrol the beach from September to April.

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

The response to rainfall graph indicates that enterococci levels increased slightly with increasing rainfall, regularly exceeding the safe swimming limit in response to 20mm or more of rainfall.

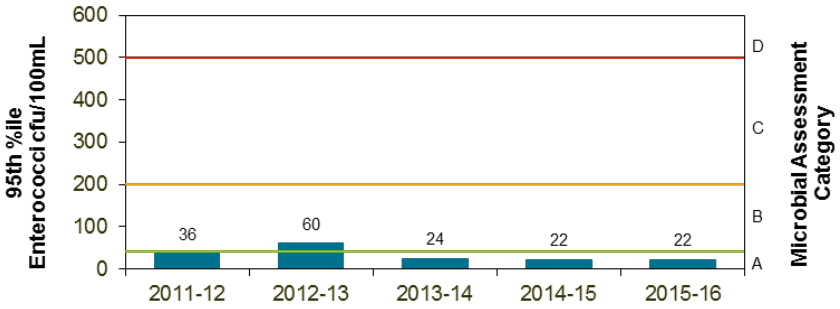
The site has been monitored since 1989. Water quality has generally been of a very high standard.

Sanitary Inspection: **Low**



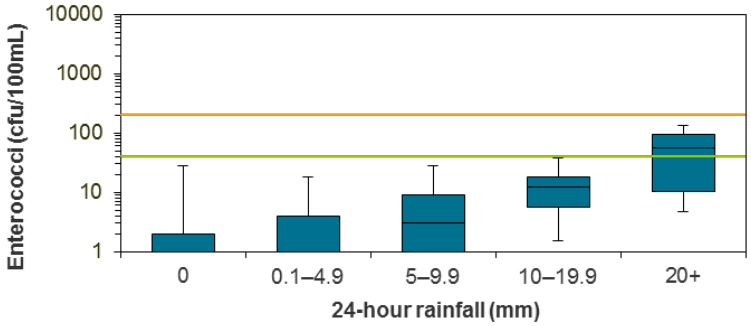
Microbial Assessment: **A**

Monitoring period for 2015–16 result is August 2014 to April 2016.

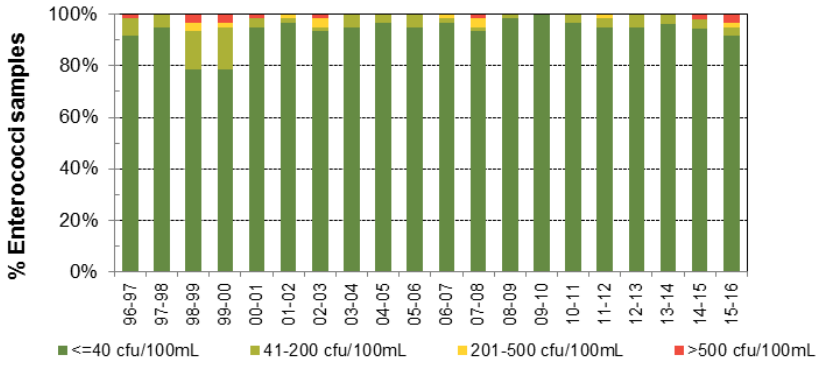


Response to rainfall

Rainfall from Avalon rain gauge



Trends in enterococci data through time



Newport Beach

Beach Suitability Grade: G

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

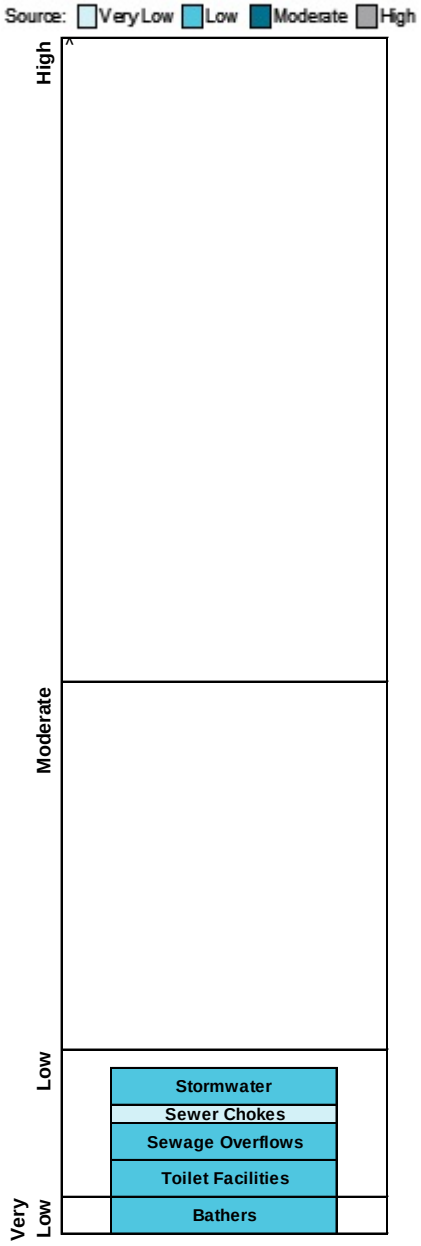
Newport Beach is 1.3 kilometres long. Several rips occur north of the surf club, and as a result beach conditions are safest in the patrolled area and in the southern corner. Lifeguards patrol the beach from September to April.

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

The response to rainfall graph indicates that enterococci levels increased with increasing rainfall, often exceeding the safe swimming limit in response to 20mm of rainfall or more.

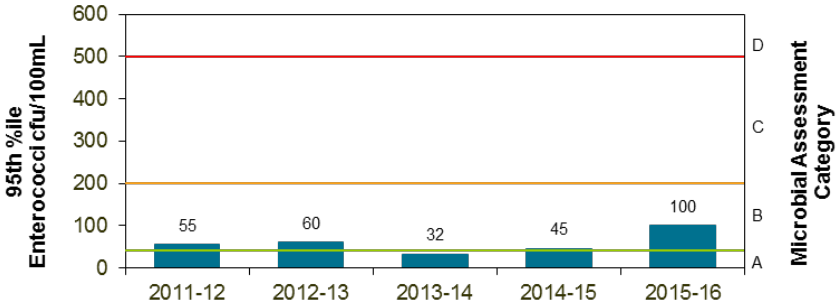
The site has been monitored since 1989. Water quality has generally been of a very high standard.

Sanitary Inspection: **Low**



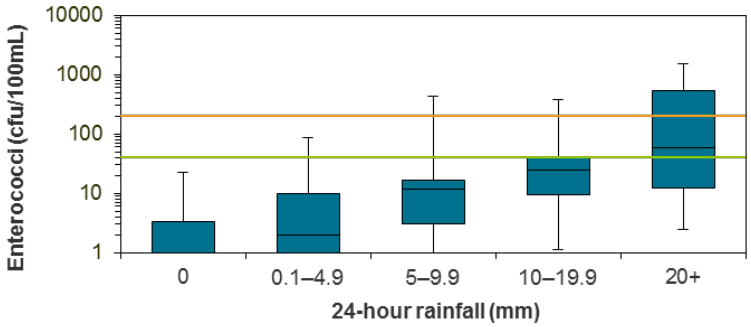
Microbial Assessment: **B**

Monitoring period for 2015–16 result is August 2014 to April 2016.

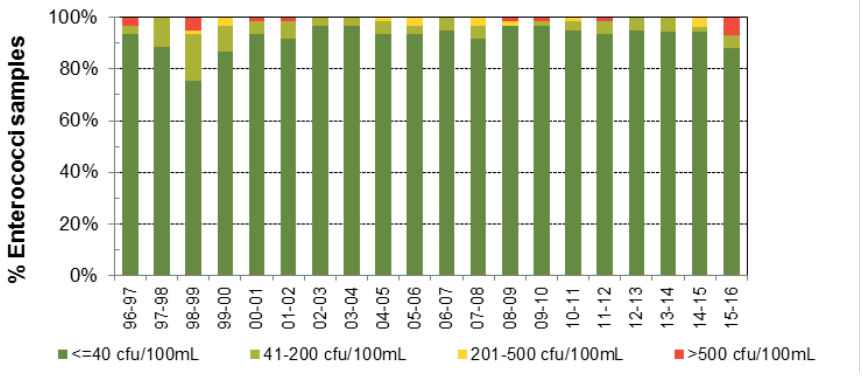


Response to rainfall

Rainfall from Warriewood WWTP rain gauge



Trends in enterococci data through time



Bungan Beach

Beach Suitability Grade: VG

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

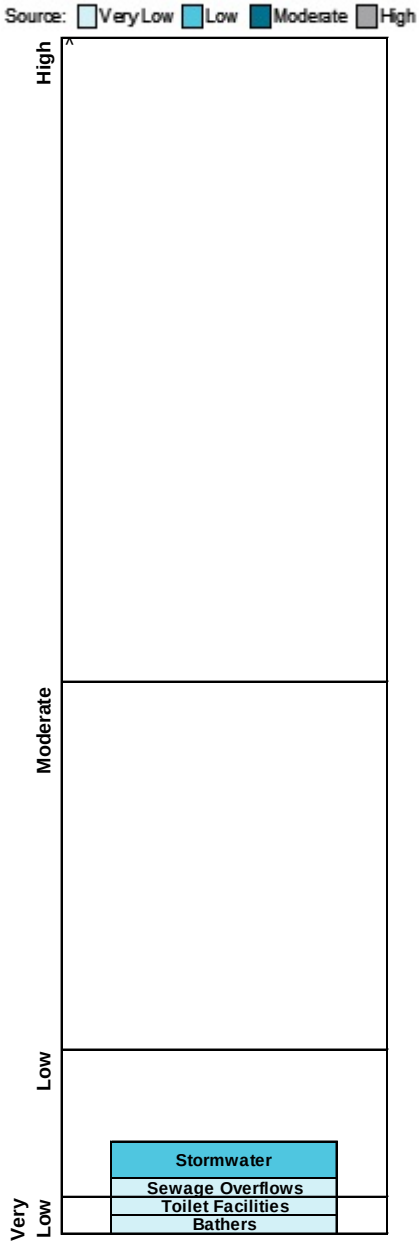
Bungan Beach is 600 metres long and backed by a steep escarpment. Swimming can be hazardous because of several shifting rips. Lifeguards patrol the beach from late December to the end of January.

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

The response to rainfall graph indicates that enterococci levels increased slightly with increasing rainfall, occasionally exceeding the safe swimming limit in response to 20mm or more of rainfall.

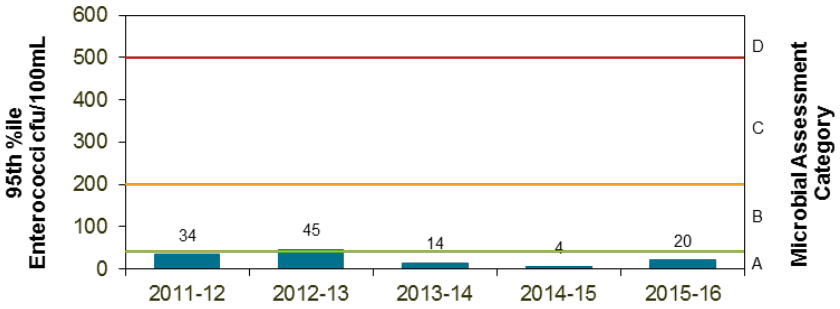
The site has been monitored since 1989. Water quality has generally been of a very high standard.

Sanitary Inspection: **Low**



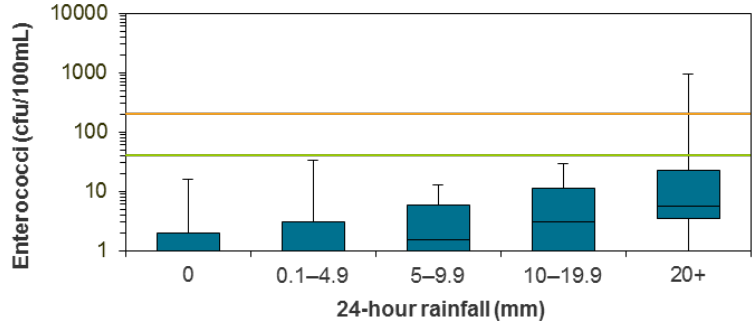
Microbial Assessment: **A**

Monitoring period for 2015–16 result is August 2014 to April 2016.

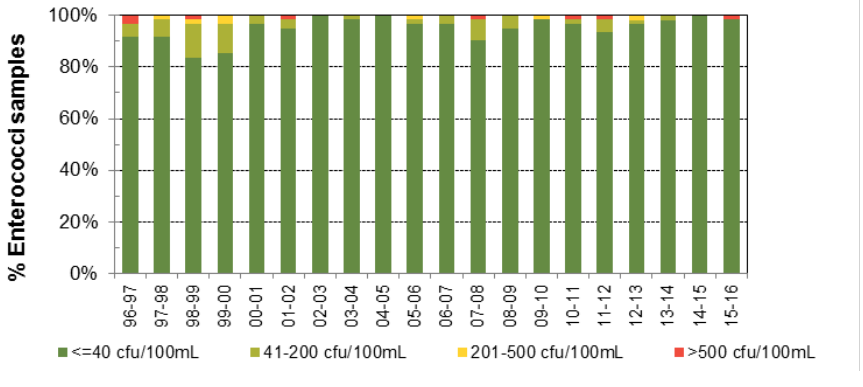


Response to rainfall

Rainfall from Warriewood WWTP rain gauge



Trends in enterococci data through time



Mona Vale Beach

Beach Suitability Grade: VG

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

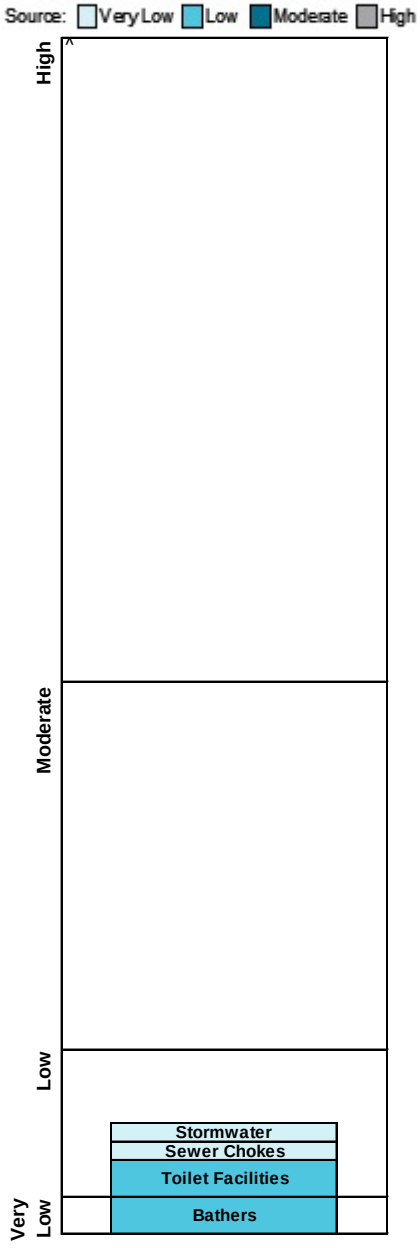
Mona Vale Beach is one kilometre long. Swimming is potentially hazardous because of a number of rips. Lifeguards patrol the beach from September to April.

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

The response to rainfall graph indicates that enterococci levels increased slightly with increasing rainfall, often exceeding the safe swimming limit in response to more than 20mm of rainfall.

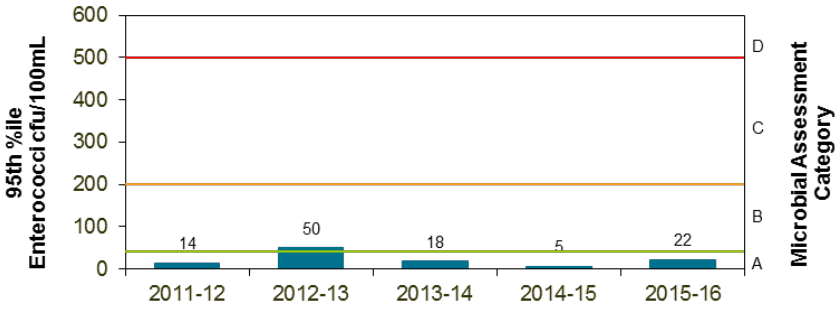
The site has been monitored since 1989. Water quality has generally been of a very high standard.

Sanitary Inspection: **Low**



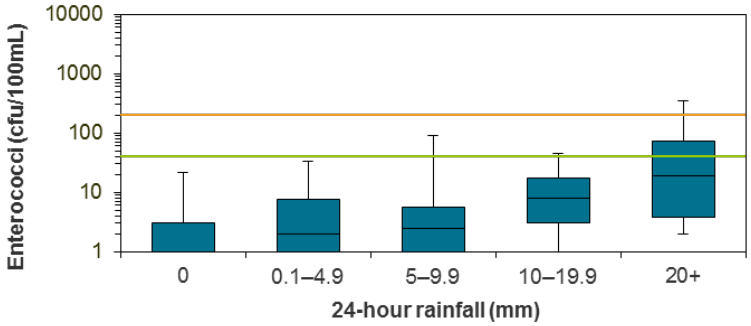
Microbial Assessment: **A**

Monitoring period for 2015–16 result is August 2014 to April 2016.

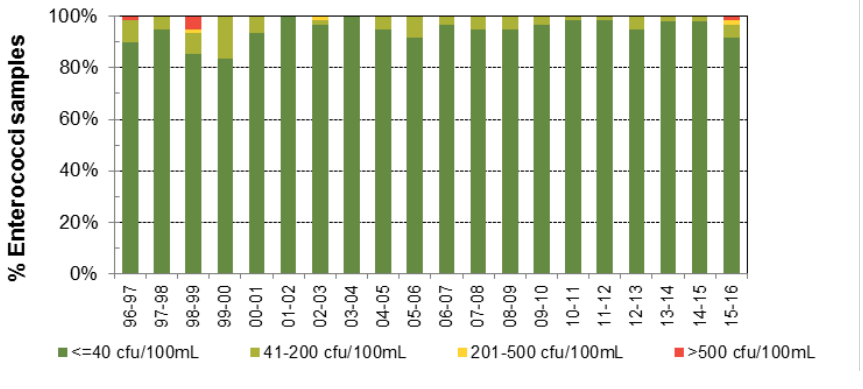


Response to rainfall

Rainfall from Warriewood WWTP rain gauge

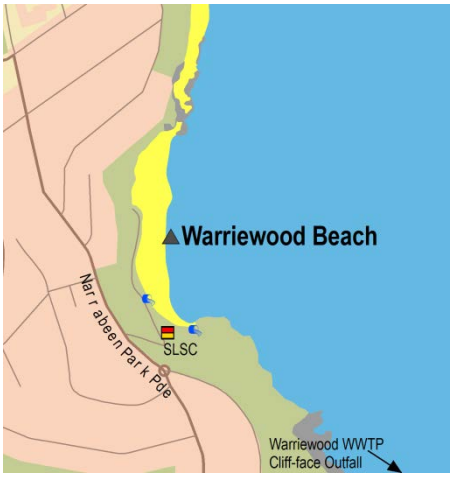


Trends in enterococci data through time



Warriewood Beach

Beach Suitability Grade: G



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

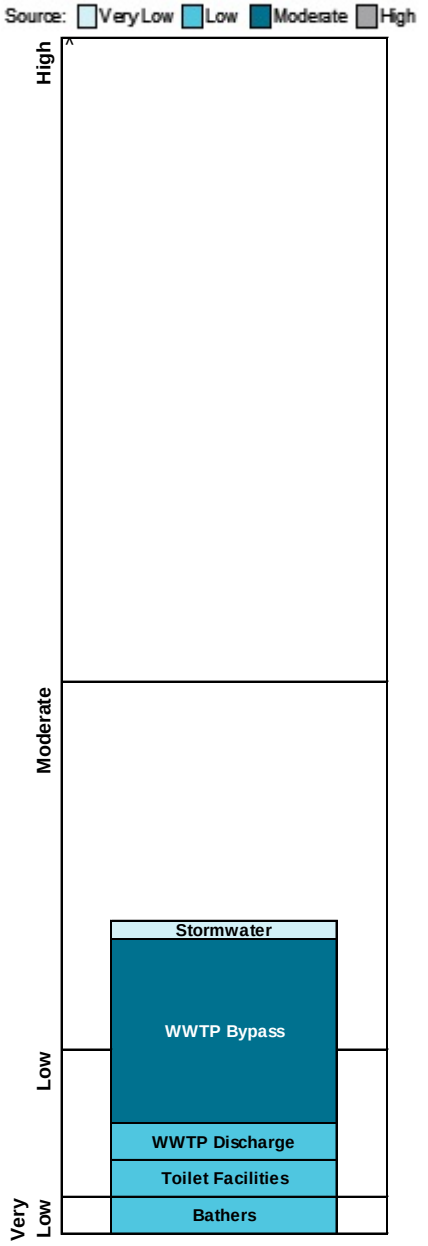
Warriewood Beach is 500 metres long and is situated below a steep bluff. Swimming can be hazardous because of rips. Lifeguards patrol the beach from December to February and during the spring and autumn holidays.

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

The response to rainfall graph indicates that enterococci levels increased slightly with increasing rainfall, occasionally exceeding the safe swimming limit after 10mm or rainfall or more.

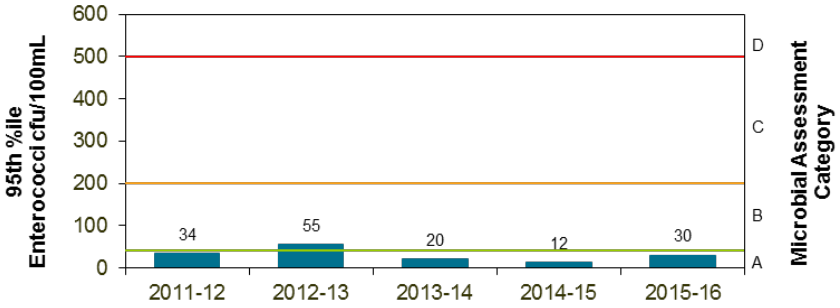
The site has been monitored since 1989. Water quality has generally been of a very high standard over the last 15 years.

Sanitary Inspection: **Moderate**



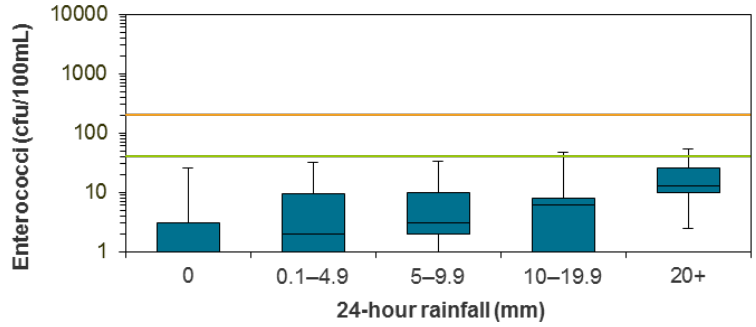
Microbial Assessment: **A**

Monitoring period for 2015–16 result is August 2014 to April 2016.

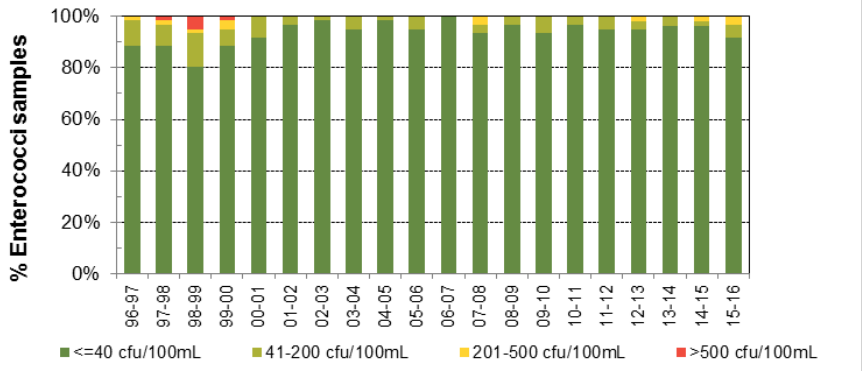


Response to rainfall

Rainfall from Warriewood WWTP rain gauge



Trends in enterococci data through time



Turimetta Beach

Beach Suitability Grade: G

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

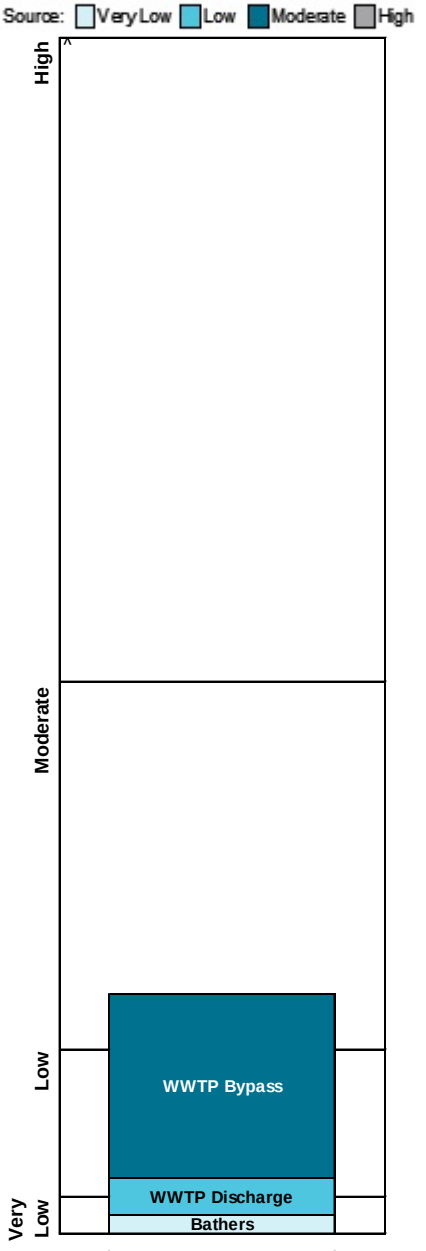
Turimetta Beach is 350 metres long and is backed by steep bluffs. Swimming can be hazardous because of rips at the centre and both ends of the beach. The beach is not patrolled by lifeguards.

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

The response to rainfall graph indicates that enterococci levels increased slightly with increasing rainfall, occasionally exceeding the safe swimming limit after 10mm or rainfall or more.

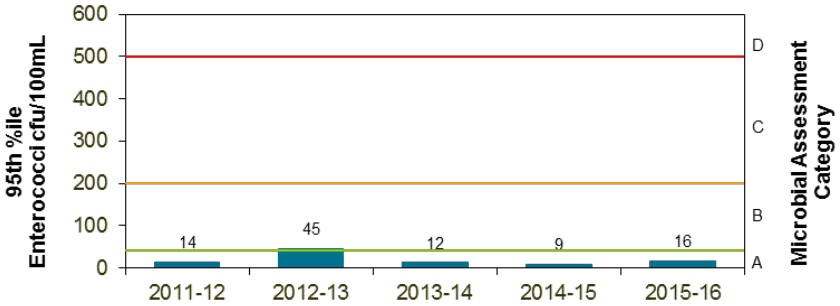
The site has been monitored since 1994. Water quality has generally been of a very high standard.

Sanitary Inspection: **Moderate**



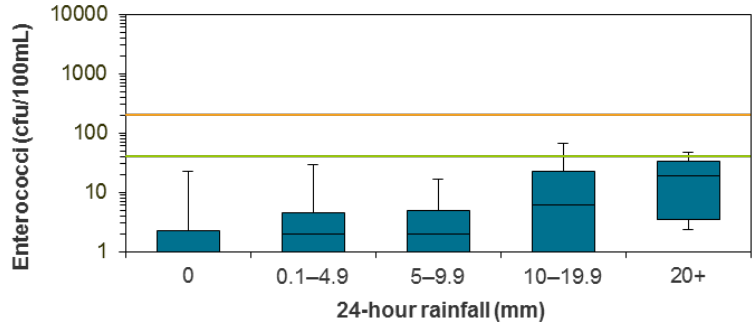
Microbial Assessment: **A**

Monitoring period for 2015–16 result is August 2014 to April 2016.

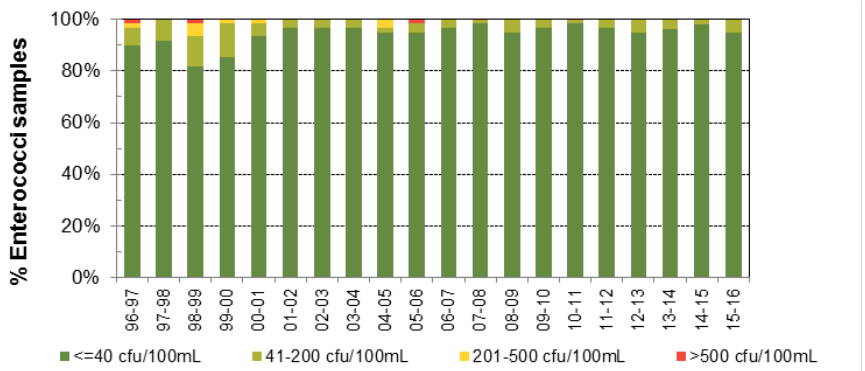


Response to rainfall

Rainfall from Warriewood WWTP rain gauge



Trends in enterococci data through time



North Narrabeen Beach

Beach Suitability Grade: G

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

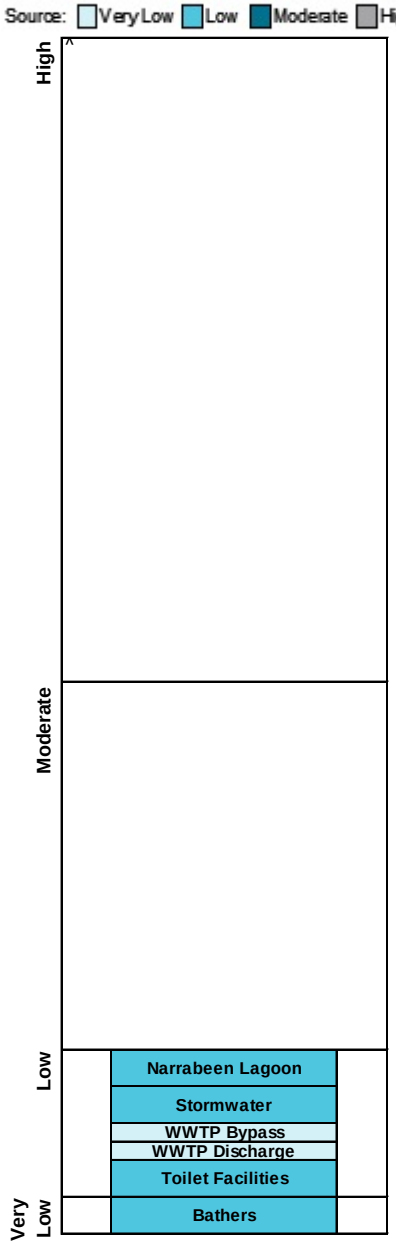
North Narrabeen Beach is located at the northern end of the 3.5 kilometre-long Narrabeen Beach. Strong rips can create hazardous swimming conditions and lifeguards patrol the beach from September to April.

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

The response to rainfall graph indicates that enterococci levels increased with increasing rainfall, often exceeding the safe swimming limit in response to 10mm of rainfall or more.

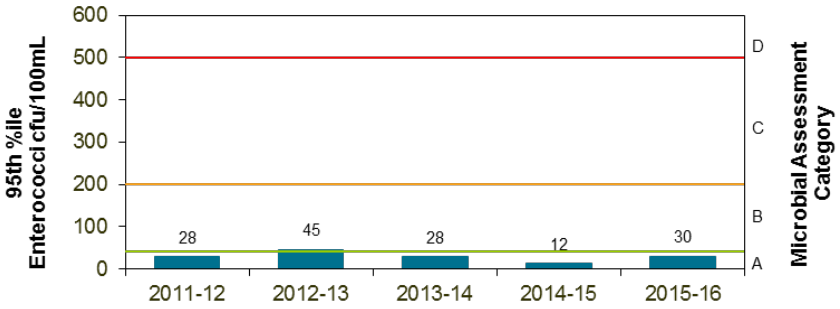
The site has been monitored since 1989. Water quality has generally been of a very high standard.

Sanitary Inspection: **Moderate**



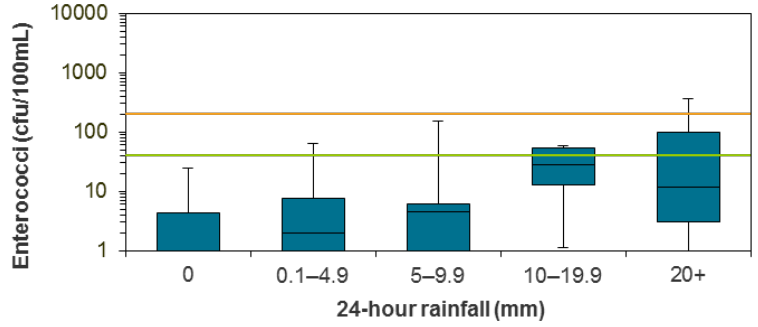
Microbial Assessment: **A**

Monitoring period for 2015–16 result is August 2014 to April 2016.

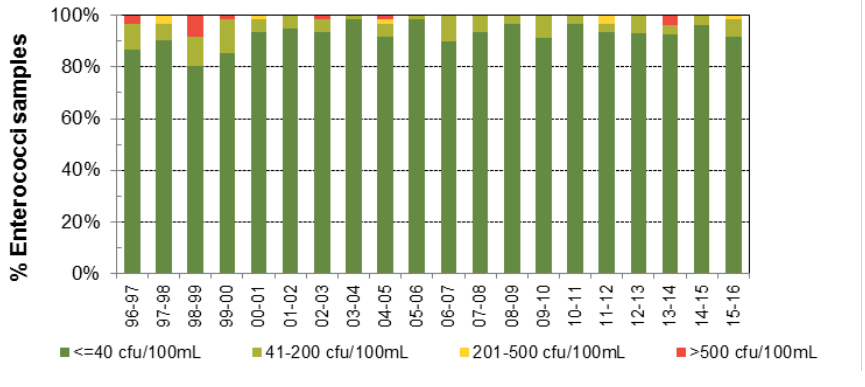


Response to rainfall

Rainfall from Warriewood WWTP rain gauge



Trends in enterococci data through time



Narrabeen Lagoon (Birdwood Park) Beach Suitability Grade: P

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

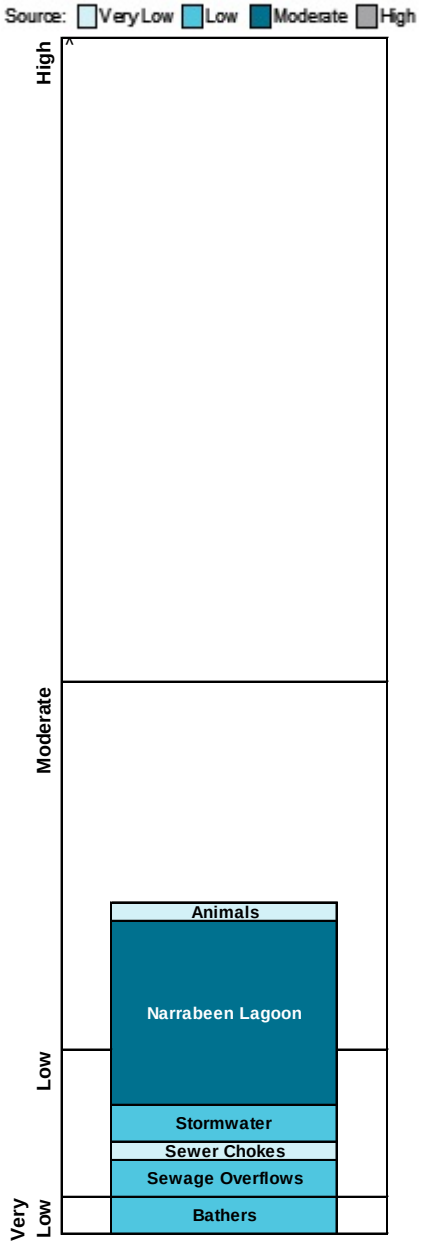
The Birdwood Park swimming site is a sandy stretch of beach located on the southern side of the entrance to Narrabeen Lagoon. The site is backed by a popular picnic area.

The Beach Suitability Grade of Poor indicates that microbial water quality is influenced by faecal pollution, usually triggered by rainfall, with several potential sources of faecal contamination including the lagoon itself.

The response to rainfall graph indicates that enterococci levels increased with increasing rainfall, occasionally exceeding the safe swimming limit in response to little or no rain, and regularly after 5mm or more.

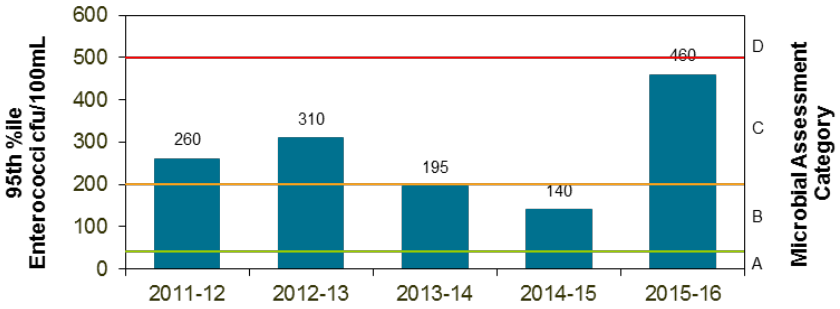
The site has been monitored since 2004 with variation in results due to rainfall patterns and lagoon openings.

Sanitary Inspection: **Moderate**



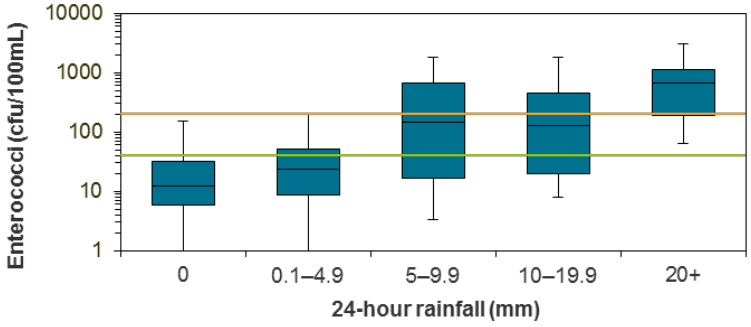
Microbial Assessment: **C**

Monitoring period for 2015–16 result is August 2014 to April 2016.

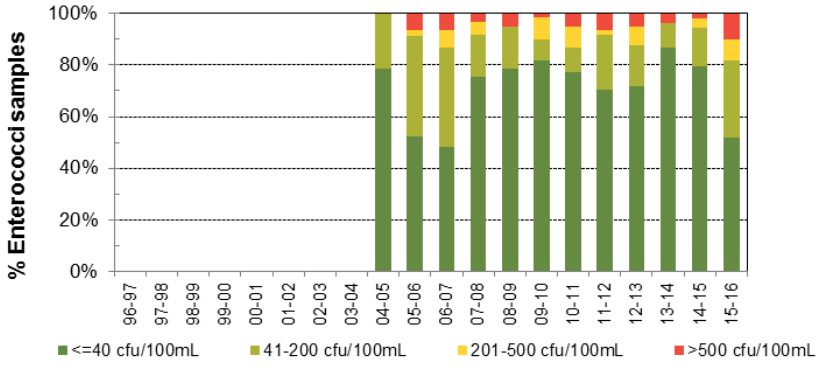


Response to rainfall

Rainfall from Warriewood WWTP rain gauge



Trends in enterococci data through time



Bilarong Reserve

Beach Suitability Grade: **P**

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

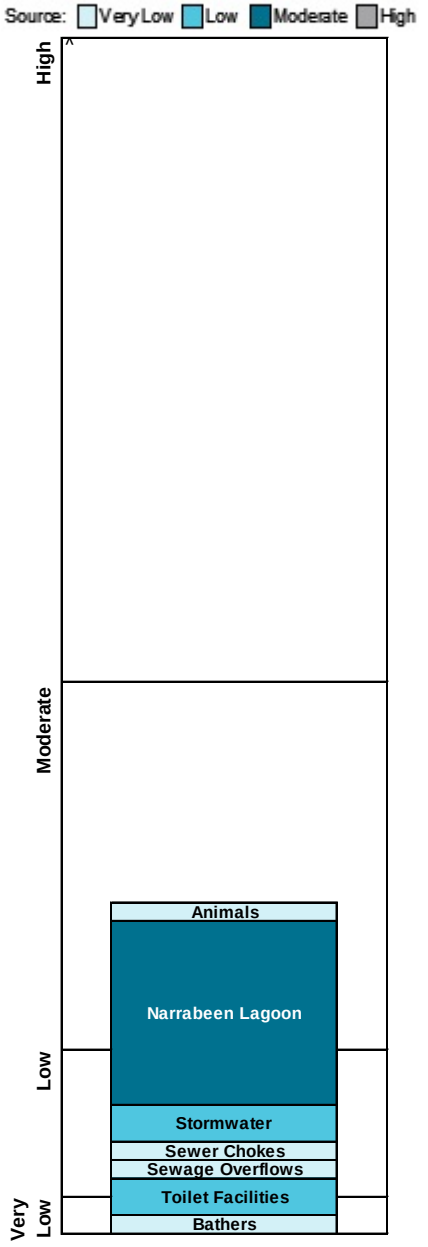
Bilarong Reserve is located on the northern shoreline of Narrabeen Lagoon. The site is backed by a playground, grass area and carpark. A boat ramp and toilet block are located nearby.

The Beach Suitability Grade of Poor indicates that the microbial water quality is susceptible to faecal pollution, with a number of potential sources of faecal contamination including the lagoon itself.

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

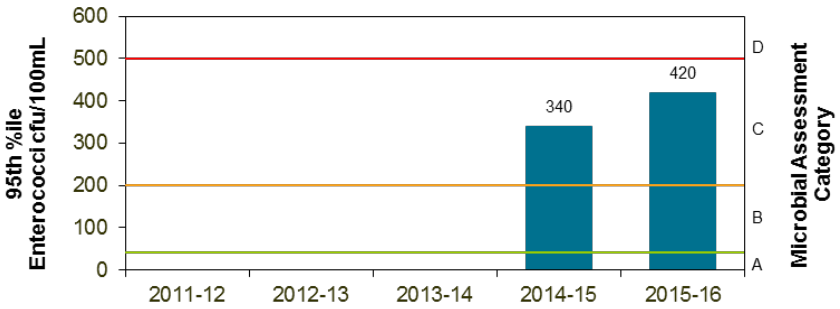
The site has been monitored since January 2014.

Sanitary Inspection: **Moderate**



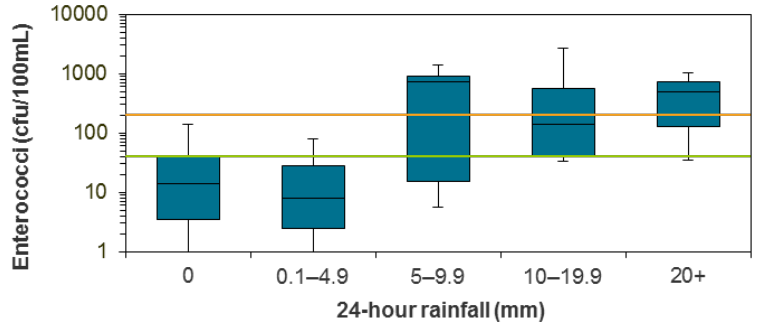
Microbial Assessment: **C**

Monitoring period for 2015–16 result is August 2014 to April 2016.

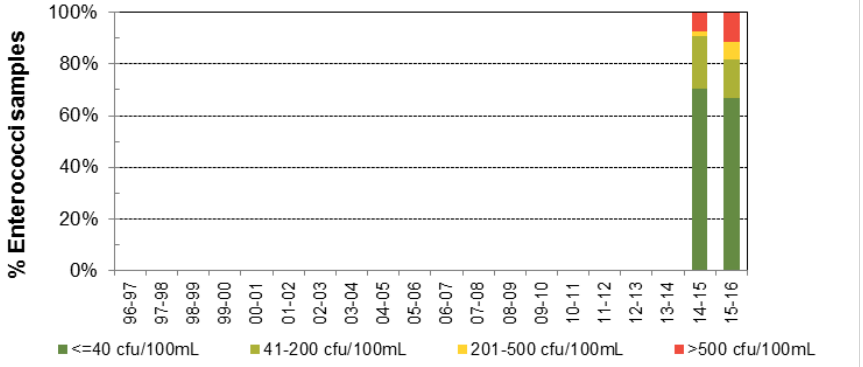


Response to rainfall

Rainfall from Warriewood WWTP rain gauge



Trends in enterococci data through time



Collaroy Beach

Beach Suitability Grade: G

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

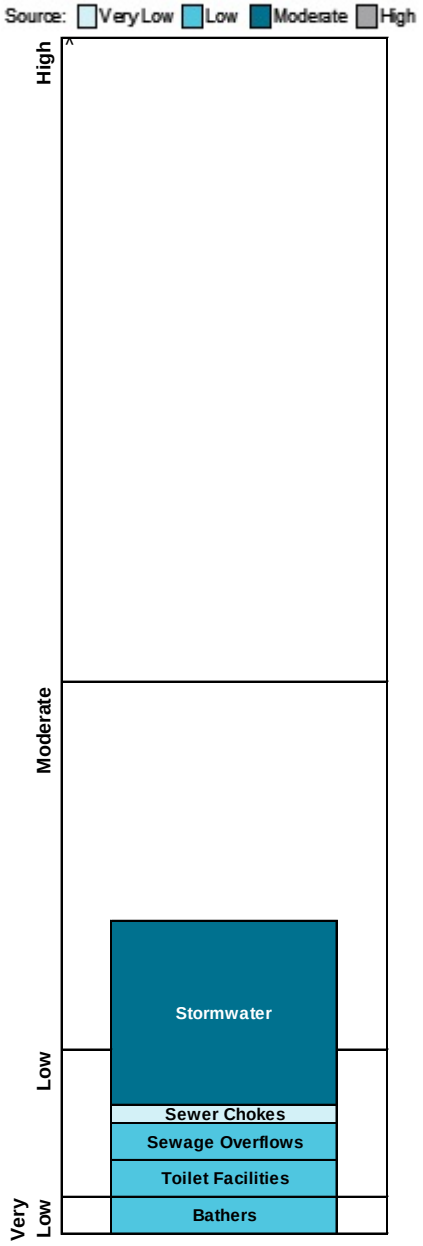
Collaroy Beach is backed by a park and picnic area, and rock baths are located at the southern end. Beach conditions are relatively safe south of the stormwater drain. Lifeguards patrol the beach from September to April.

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

The response to rainfall graph indicates that enterococci levels generally increased with increasing rainfall, often exceeding the safe swimming limit in response to 10mm of rainfall or more.

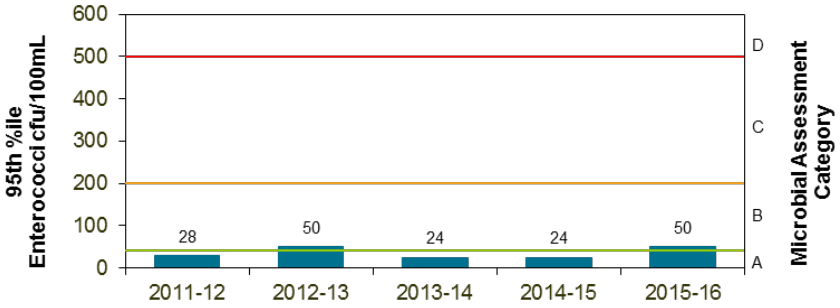
The site has been monitored since 1989. Water quality has generally been of a very high standard.

Sanitary Inspection: **Moderate**



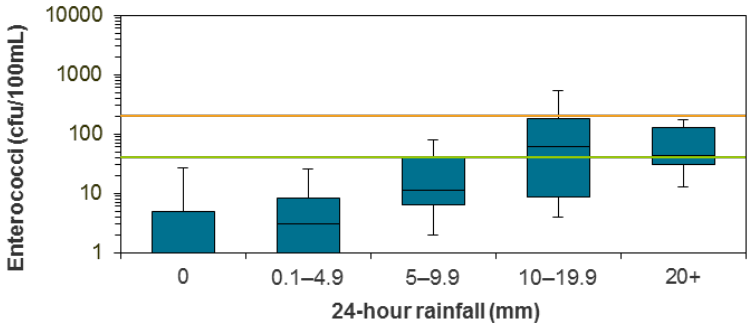
Microbial Assessment: **B**

Monitoring period for 2015–16 result is August 2014 to April 2016.

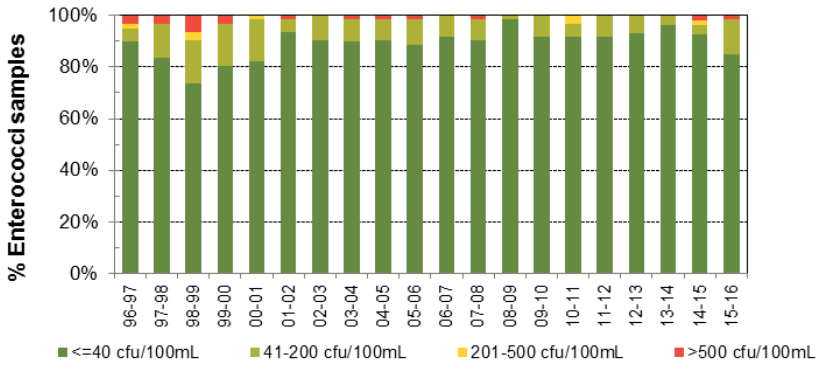


Response to rainfall

Rainfall from Dee Why rain gauge



Trends in enterococci data through time



Long Reef Beach

Beach Suitability Grade: G

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

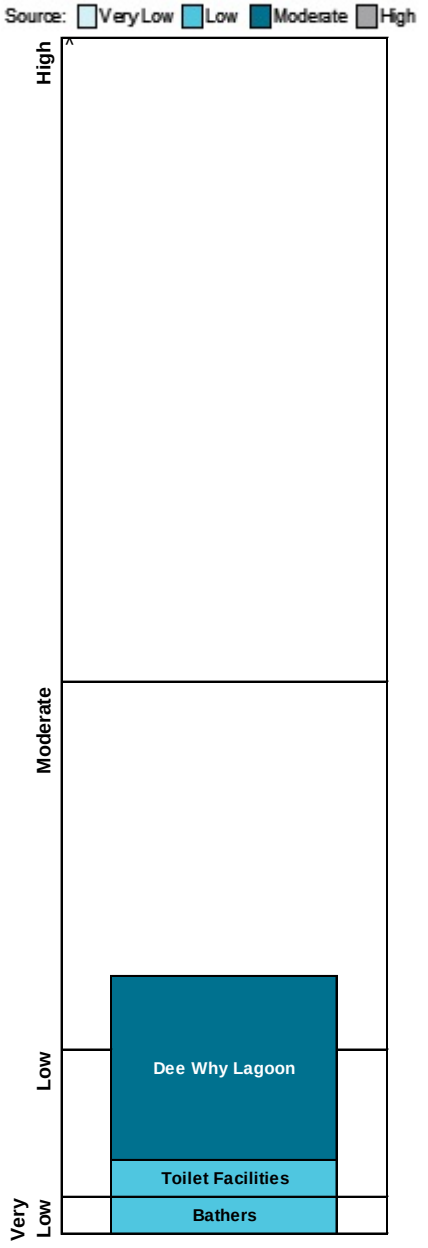
Long Reef Beach is backed by a golf course and a reserve. Strong rips create hazardous swimming conditions, and lifeguards patrol the beach from September to April.

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

The response to rainfall graph indicates that enterococci levels generally increased with increasing rainfall, occasionally exceeding the safe swimming limit in response to light rainfall.

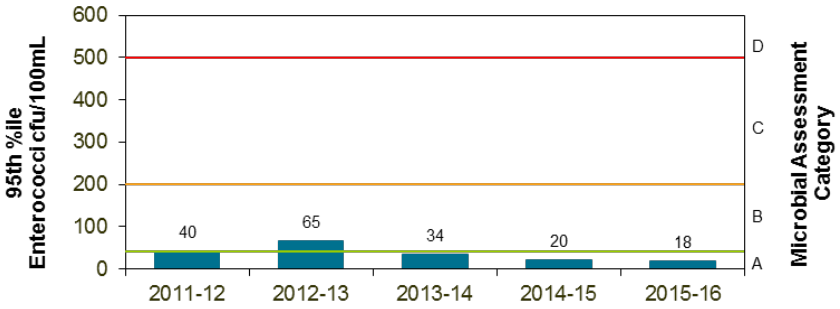
The site has been monitored since 1989. Water quality has generally been of a very high standard over the last 15 years.

Sanitary Inspection: **Moderate**



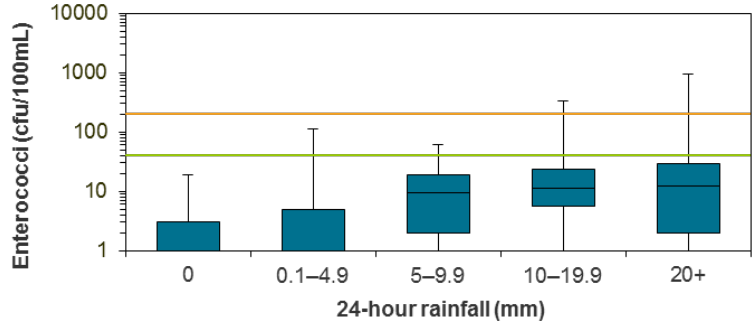
Microbial Assessment: **A**

Monitoring period for 2015–16 result is August 2014 to April 2016.

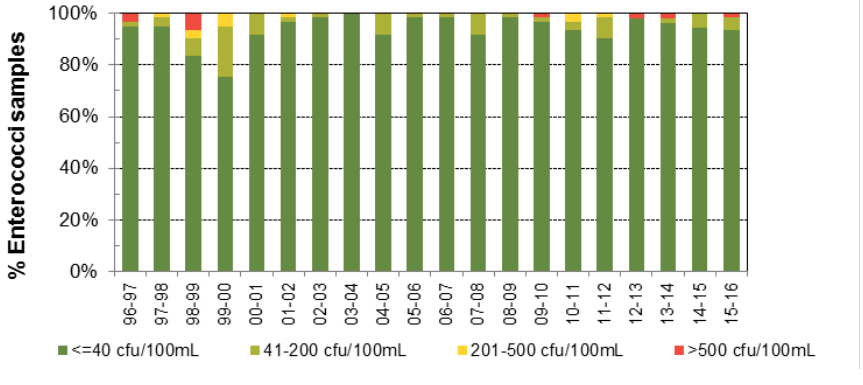


Response to rainfall

Rainfall from Dee Why rain gauge

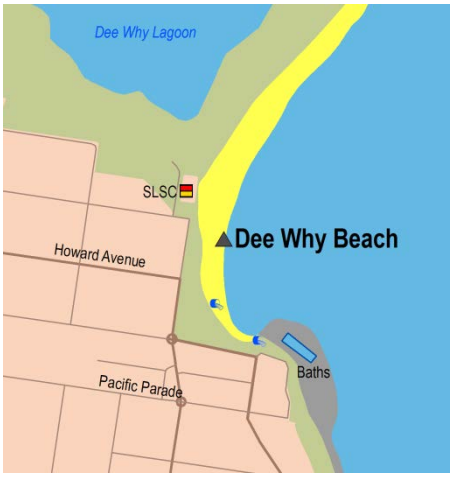


Trends in enterococci data through time



Dee Why Beach

Beach Suitability Grade: VG



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

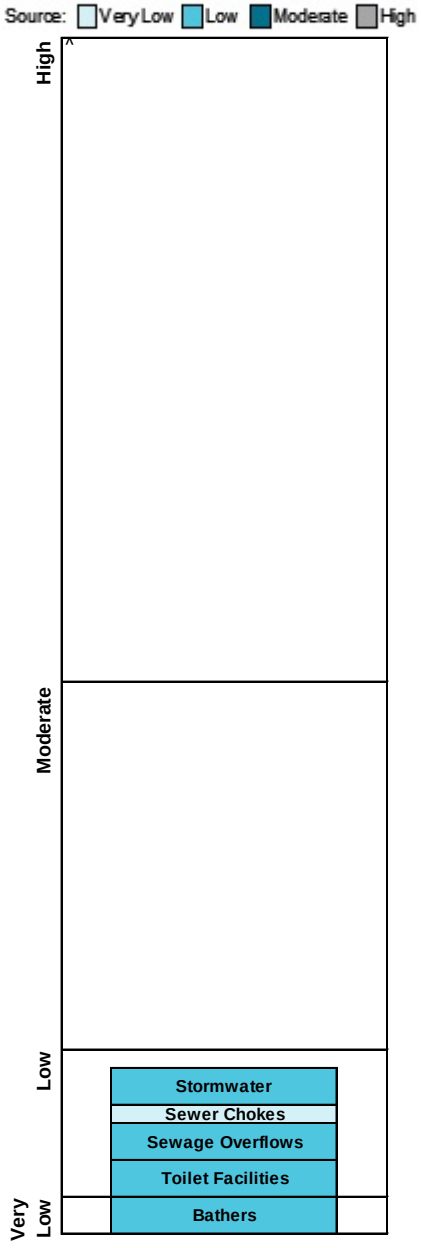
Dee Why Beach is backed in part by a park and picnic area and there is an ocean pool at the southern end. Swimming can be hazardous because of strong rips and lifeguards patrol the beach from late August to May.

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

The response to rainfall graph indicates that enterococci levels generally increased slightly with increasing rainfall, but mostly remained below the safe swimming limit across all rainfall categories.

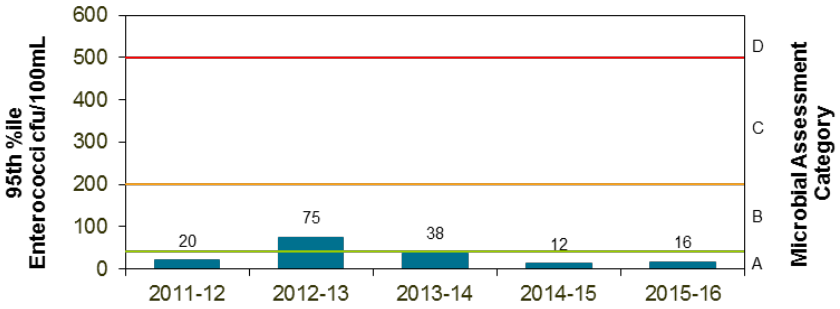
The site has been monitored since 1989. Water quality has generally been of a high standard.

Sanitary Inspection: **Low**



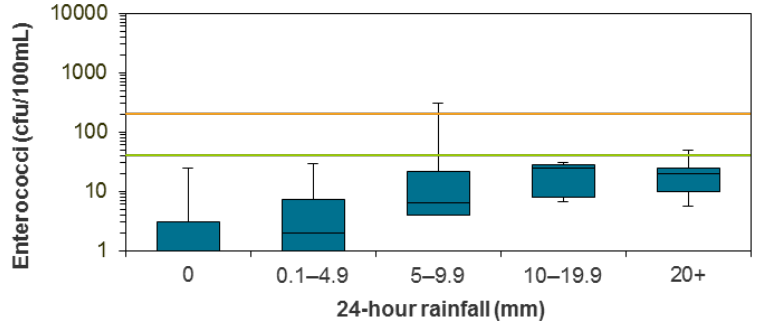
Microbial Assessment: **A**

Monitoring period for 2015–16 result is August 2014 to April 2016.

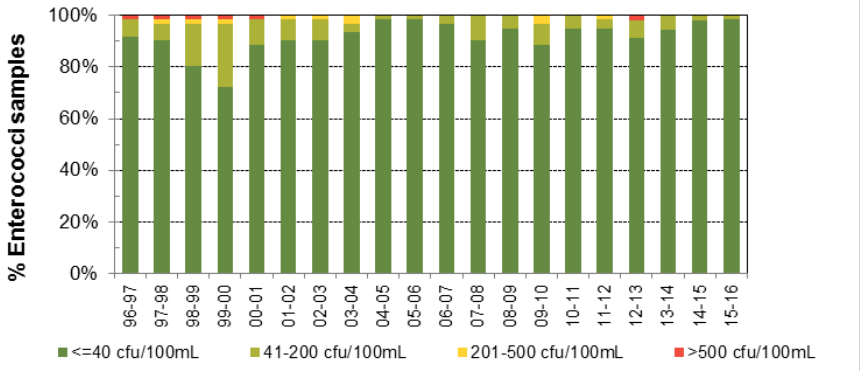


Response to rainfall

Rainfall from Dee Why rain gauge



Trends in enterococci data through time



North Curl Curl Beach

Beach Suitability Grade: G

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

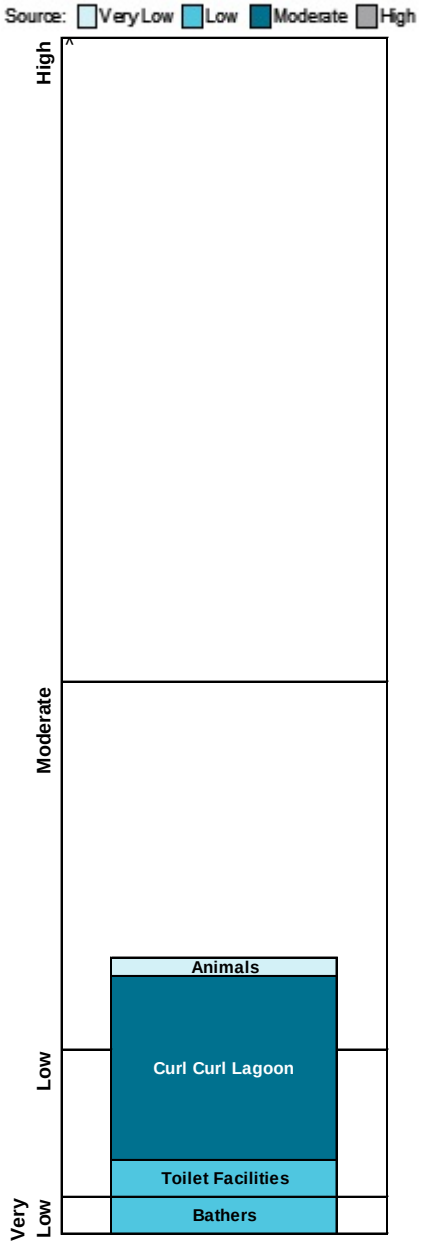
North Curl Curl Beach is safest in the northern corner. Lifeguards patrol the beach from September to April.

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

The response to rainfall graph indicates that enterococci levels increased with increasing rainfall, frequently exceeding the safe swimming limit in response to 20mm or more of rainfall.

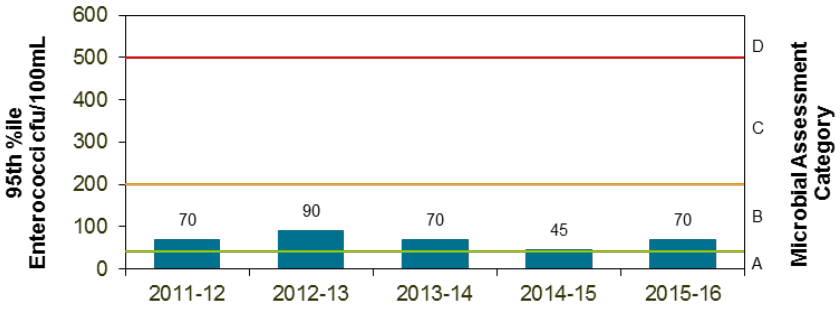
The site has been monitored since 1989. Water quality has generally been of a high standard, with year to year variations the result of lagoon openings and rainfall.

Sanitary Inspection: **Moderate**



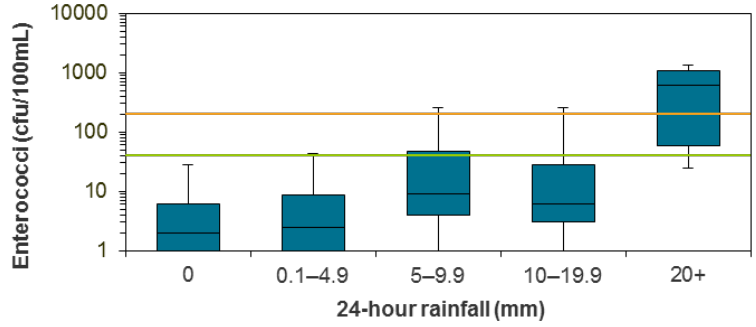
Microbial Assessment: **B**

Monitoring period for 2015–16 result is August 2014 to April 2016.

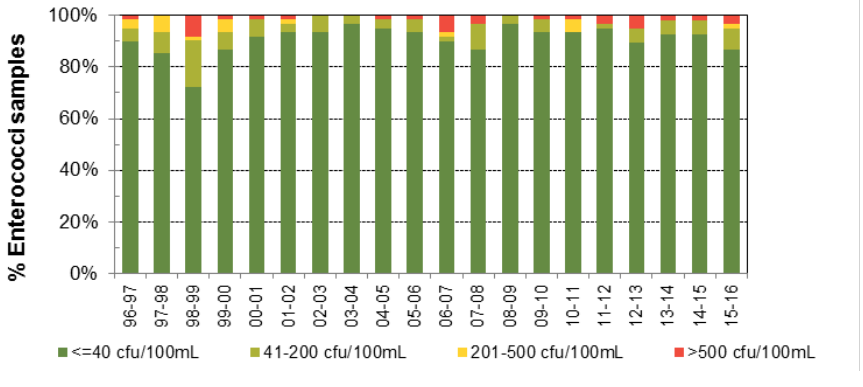


Response to rainfall

Rainfall from Harbord rain gauge



Trends in enterococci data through time



South Curl Curl Beach

Beach Suitability Grade: VG

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

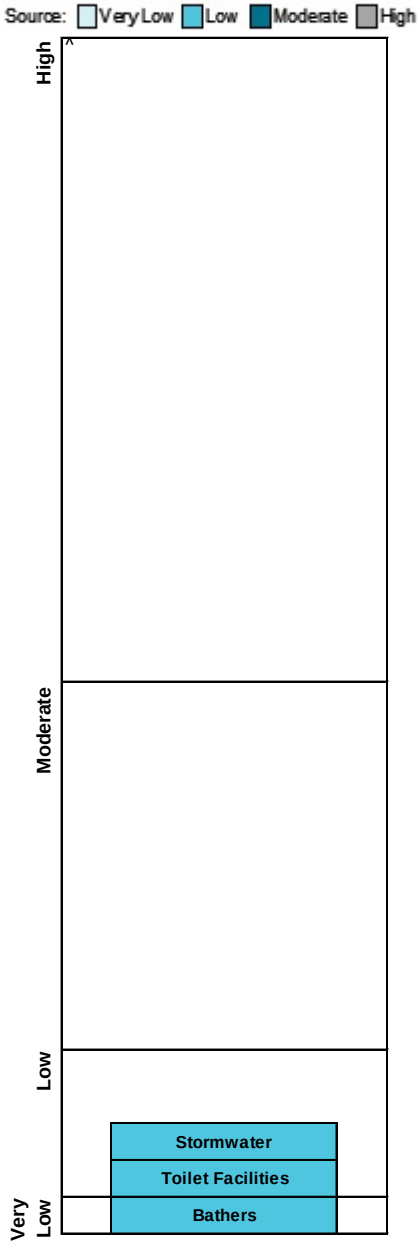
South Curl Curl Beach is at the southern end of Curl Curl Beach. Swimming can be hazardous because of rips, and lifeguards patrol the beach from September to April.

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

The response to rainfall graph indicates that enterococci levels increased with increasing rainfall, often exceeding the safe swimming limit in response to 20mm or more of rainfall.

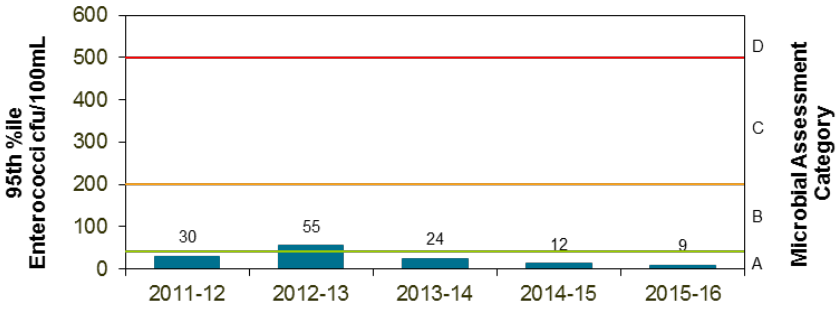
The site has been monitored since 1989. Water quality has been of a high standard.

Sanitary Inspection: **Low**



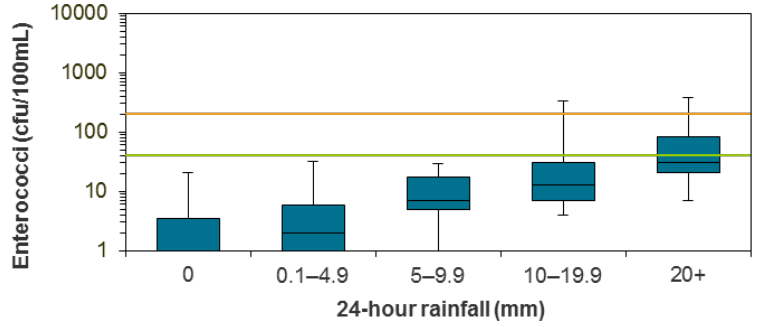
Microbial Assessment: **A**

Monitoring period for 2015–16 result is August 2014 to April 2016.

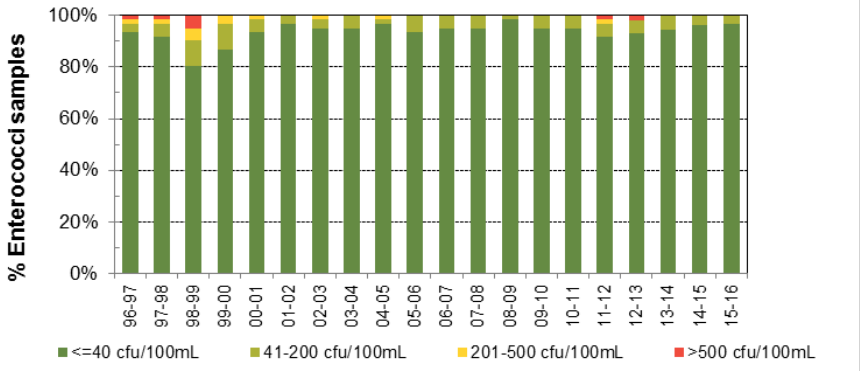


Response to rainfall

Rainfall from Harbord rain gauge



Trends in enterococci data through time



Freshwater Beach

Beach Suitability Grade: G

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

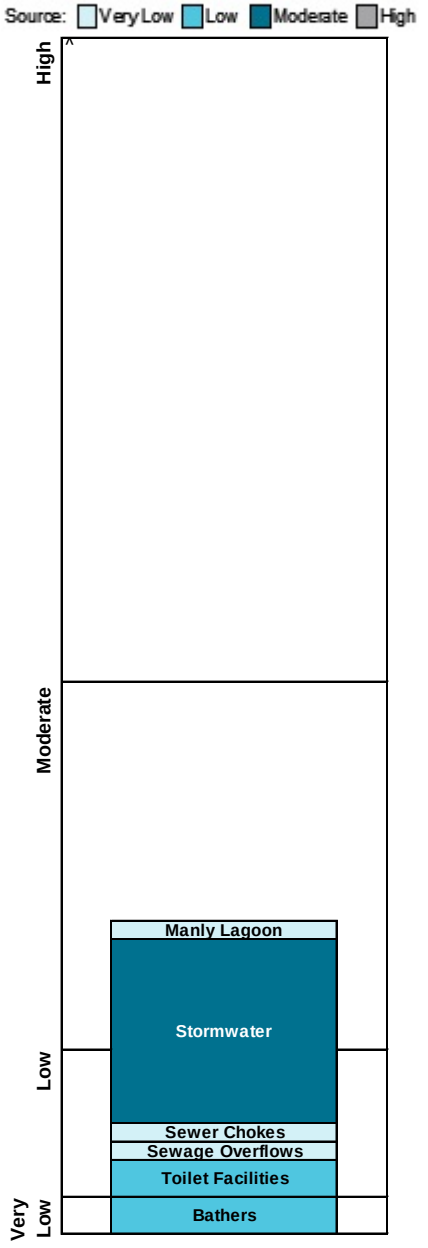
Freshwater Beach is approximately 350 metres long. Rock baths are located on the northern rock platform. Lifeguards patrol the beach from late August to May.

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

The response to rainfall graph indicates that enterococci levels increased with increasing rainfall, often exceeding the safe swimming limit in response to 10mm of rainfall or more.

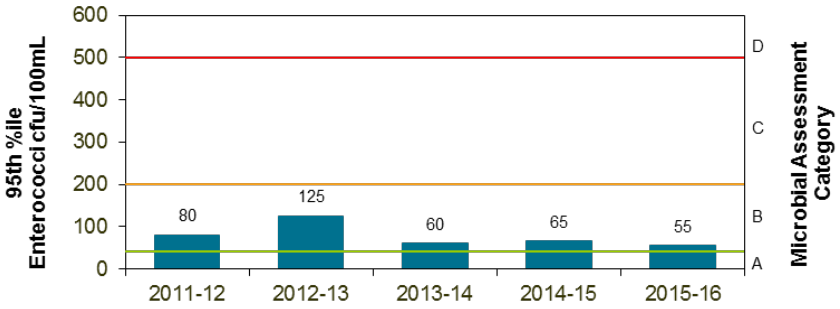
The site has been monitored since 1989. Water quality has been of a high standard.

Sanitary Inspection: **Moderate**



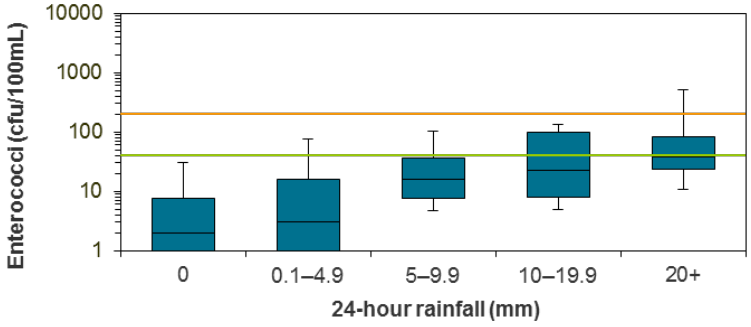
Microbial Assessment: **B**

Monitoring period for 2015–16 result is August 2014 to April 2015.

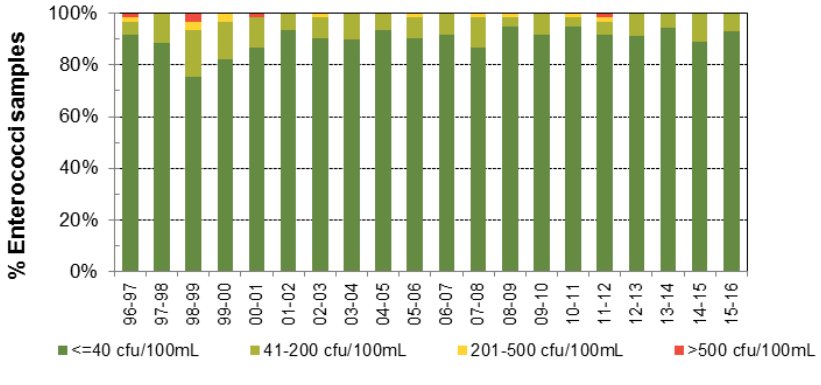


Response to rainfall

Rainfall from Harbord rain gauge



Trends in enterococci data through time



Queenscliff Beach

Beach Suitability Grade: G

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

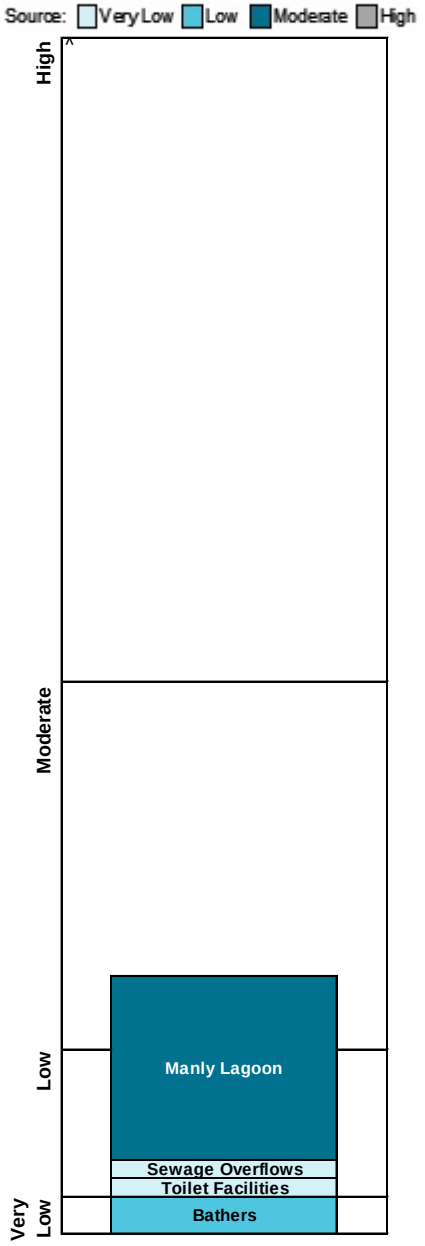
Queenscliff Beach is located at the northern end of Manly Beach. Swimming may be hazardous because of rips. Lifeguards patrol the beach from September to April.

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

The response to rainfall graph indicates that enterococci levels increased with increasing rainfall, regularly exceeding the safe swimming limit after 5mm of rainfall or more.

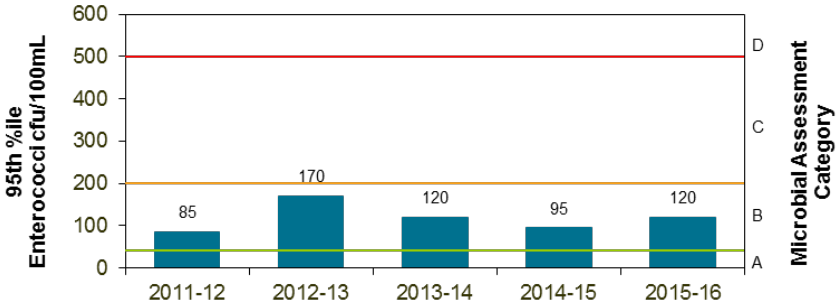
The site has been monitored since 1989, with variation in results since 1990 due to rainfall patterns and lagoon openings.

Sanitary Inspection: **Moderate**



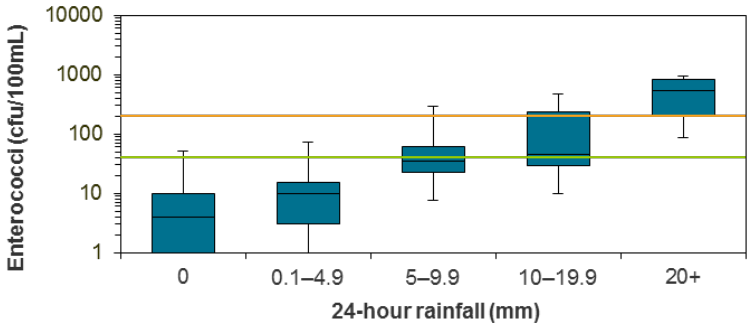
Microbial Assessment: **B**

Monitoring period for 2015–16 result is August 2014 to April 2016.

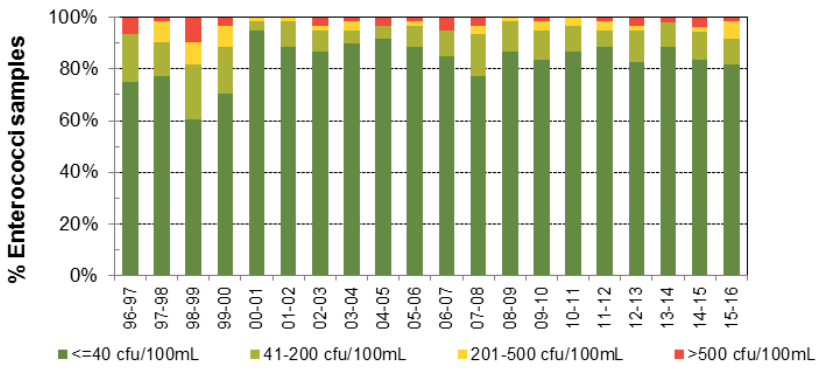


Response to rainfall

Rainfall from Manly rain gauge



Trends in enterococci data through time



North Steyne Beach

Beach Suitability Grade: G

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

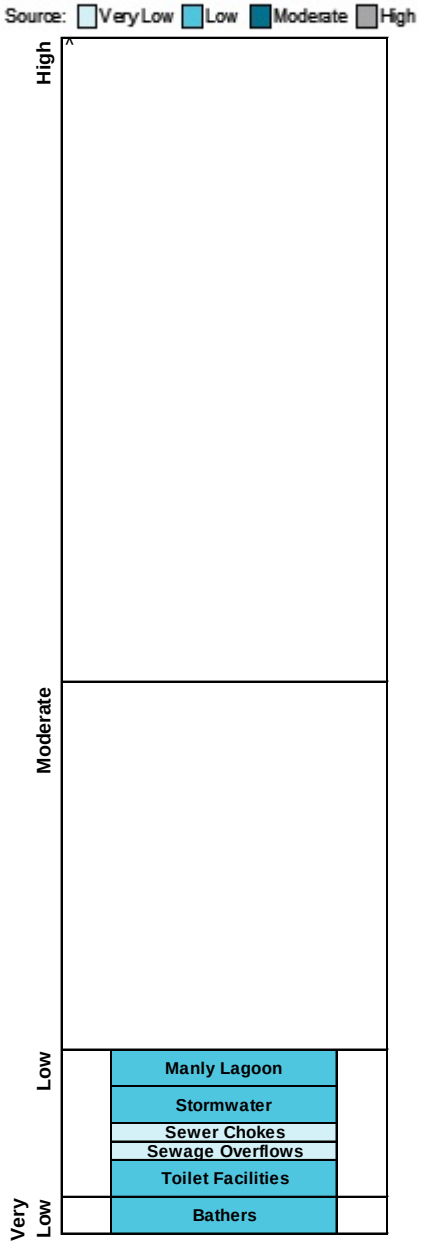
North Steyne Beach is the middle section of Manly Beach. Swimming can be hazardous, as rips occur along the beach. Lifeguards patrol the beach from September to April.

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

The response to rainfall graph indicates that enterococci levels increased with increasing rainfall, regularly exceeding the safe swimming limit after 10mm of rainfall or more.

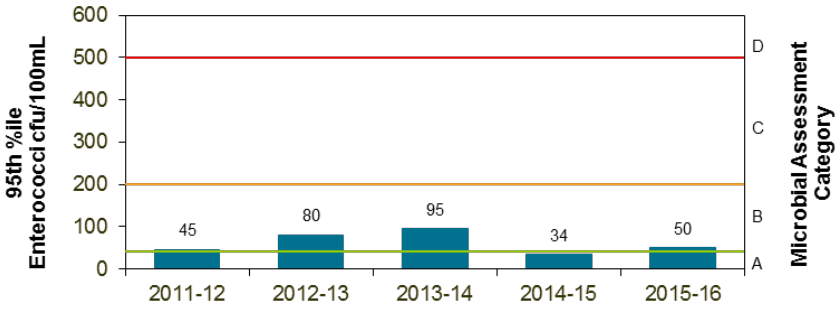
The site has been monitored since 1989.

Sanitary Inspection: **Moderate**



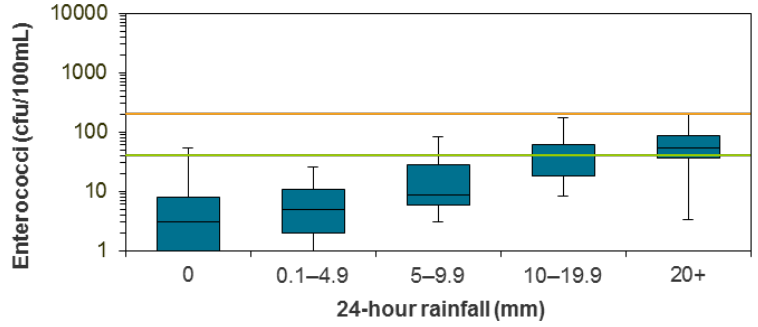
Microbial Assessment: **B**

Monitoring period for 2015–16 result is August 2014 to April 2016.

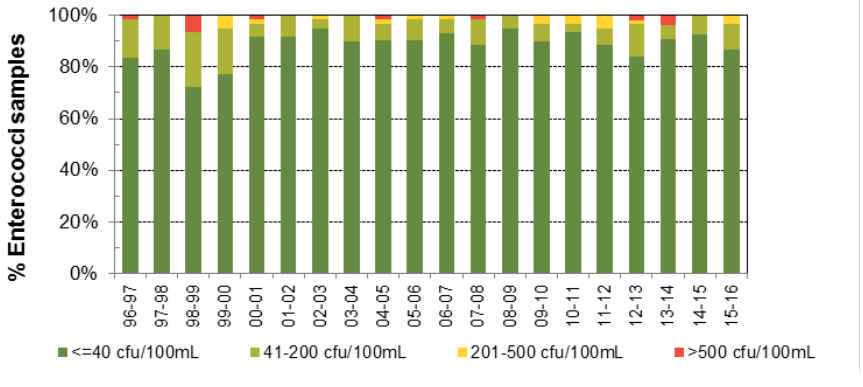


Response to rainfall

Rainfall from Manly rain gauge

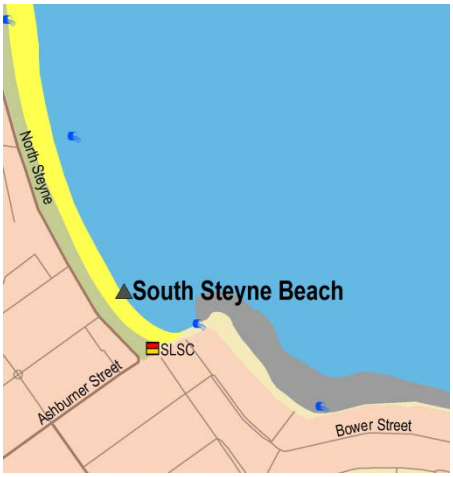


Trends in enterococci data through time



South Steyne Beach

Beach Suitability Grade: G



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

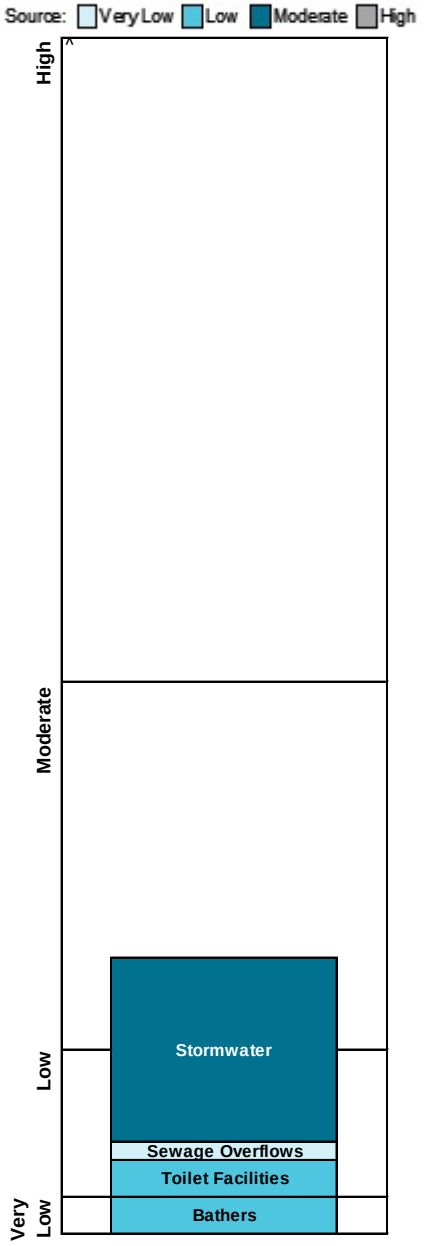
South Steyne Beach is at the southern end of Manly Beach. The beach is popular with tourists and locals. Lifeguards patrol the beach year round.

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

The response to rainfall graph indicates that enterococci levels generally increased with increasing rainfall, often exceeding the safe swimming limit after 10mm of rainfall or more.

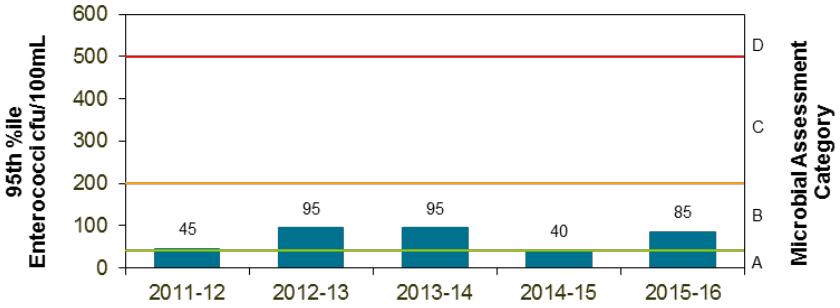
The site has been monitored since 1989.

Sanitary Inspection: **Moderate**



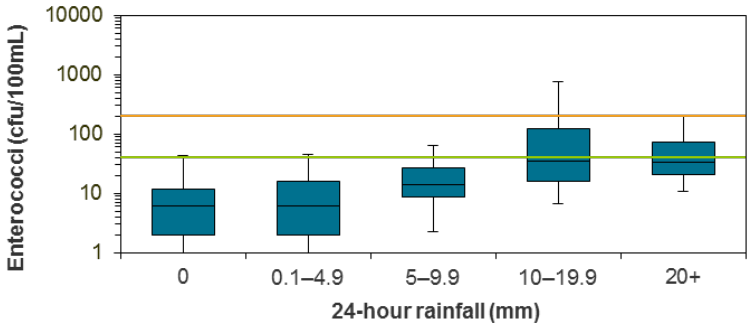
Microbial Assessment: **B**

Monitoring period for 2015–16 result is August 2014 to April 2016.

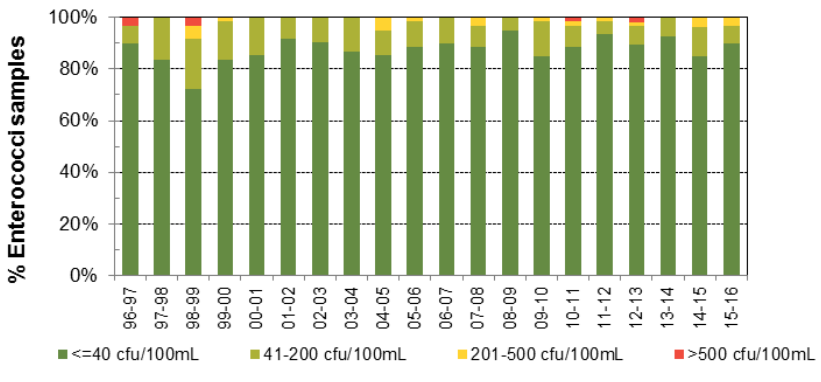


Response to rainfall

Rainfall from Manly rain gauge



Trends in enterococci data through time



Shelly Beach

Beach Suitability Grade: G

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

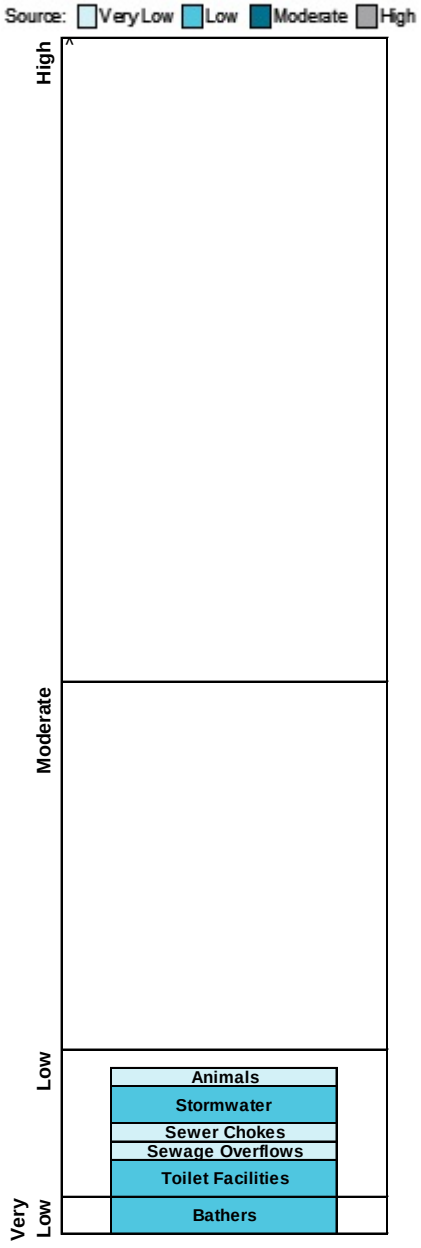
Shelly Beach is backed by a picnic area and reserve. The beach offers no surf and apart from the deep water close to shore, it is relatively safe for swimming. The beach is not patrolled by lifeguards.

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

The response to rainfall graph indicates that enterococci levels generally increased with increasing rainfall, often exceeding the safe swimming limit in response to 10mm of rain or more.

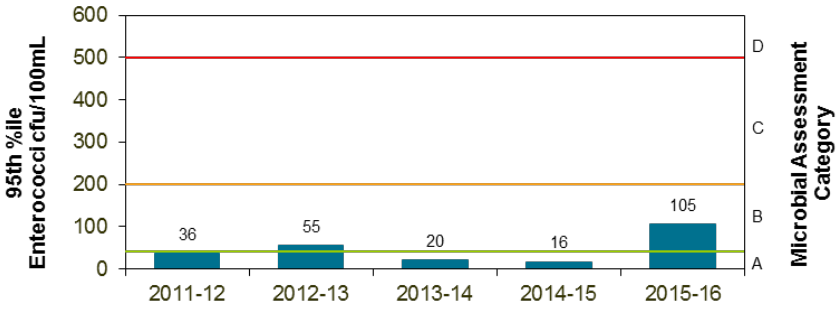
The site has been monitored since 1989. Microbial water quality improved in 2000–2001 when sewage overflows to the bay were diverted to North Head Wastewater Treatment Plant.

Sanitary Inspection: **Low**



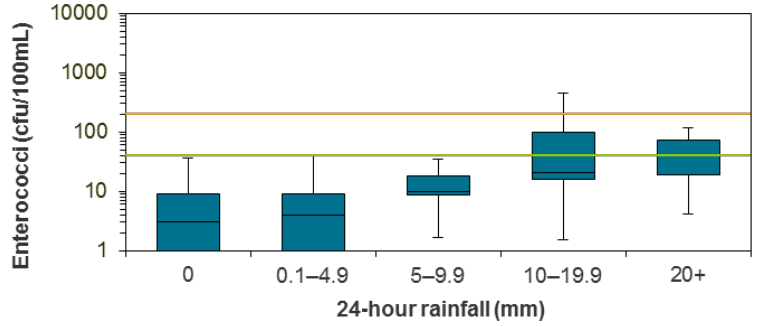
Microbial Assessment: **B**

Monitoring period for 2015–16 result is August 2014 to April 2015.

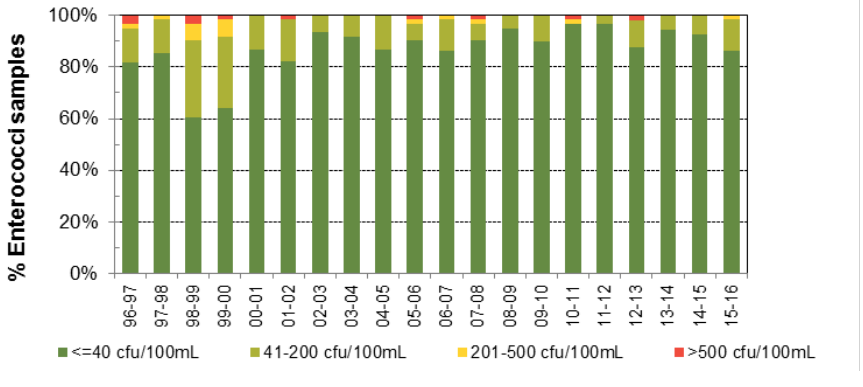


Response to rainfall

Rainfall from Manly rain gauge



Trends in enterococci data through time



Barrenjoey Beach

Beach Suitability Grade: P

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

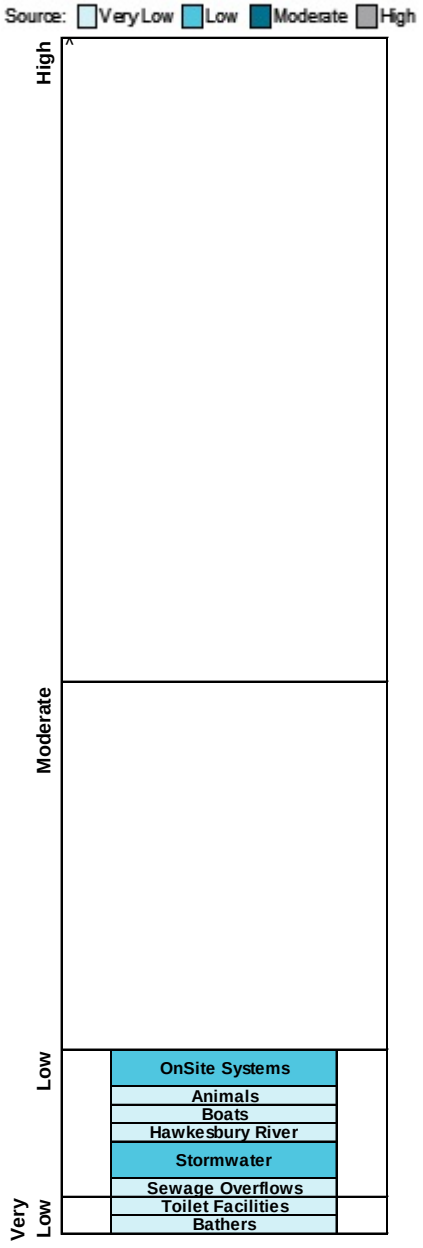
Barrenjoey Beach is approximately 1.5 kilometres long and located on the north-eastern foreshore of Pittwater. The beach is backed by a reserve.

The Beach Suitability Grade of Poor indicates that the water quality is safe for swimming most of the time but can be susceptible to pollution after heavy rain, with several minor sources of faecal contamination, including stormwater.

The response to rainfall graph indicates that enterococci levels increased with increasing rainfall, occasionally exceeding the safe swimming limit after little or no rainfall, and regularly after 10mm of rainfall or more.

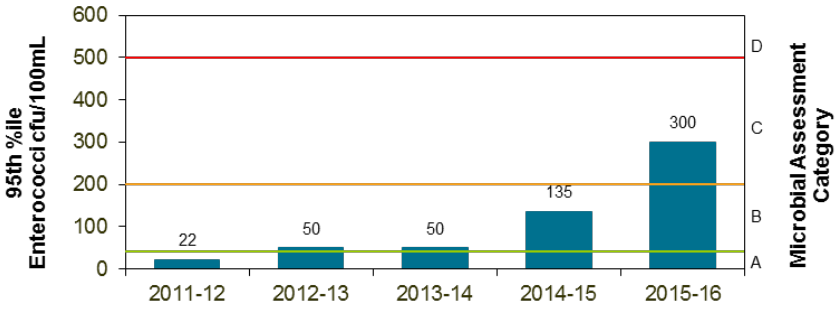
The site has been monitored since 1996. Microbial water quality improved significantly in 2000 when the toilet facilities at the beach were connected to the reticulated sewerage system. Since November 2014, the sampling point has moved to the shoreline as access by boat is restricted due to seagrass beds.

Sanitary Inspection: **Moderate**



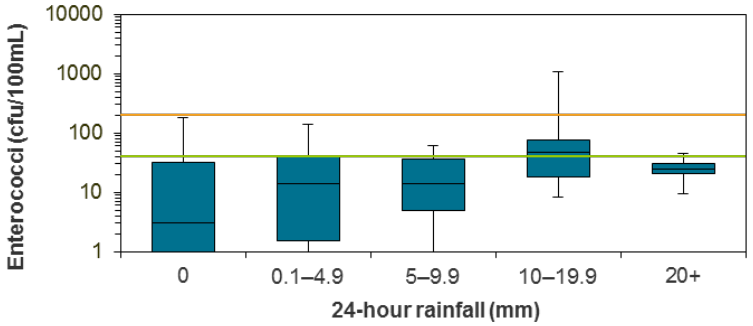
Microbial Assessment: **C**

Monitoring period for 2015–16 result is December 2013 to May 2016.

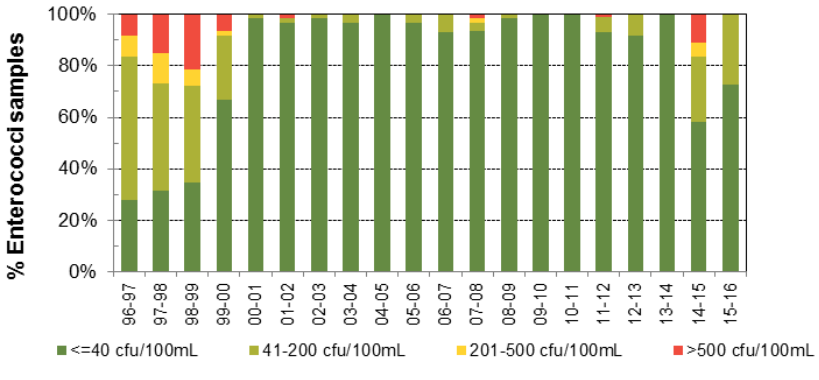


Response to rainfall

Rainfall from Avalon rain gauge



Trends in enterococci data through time



Paradise Beach Baths

Beach Suitability Grade: G

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

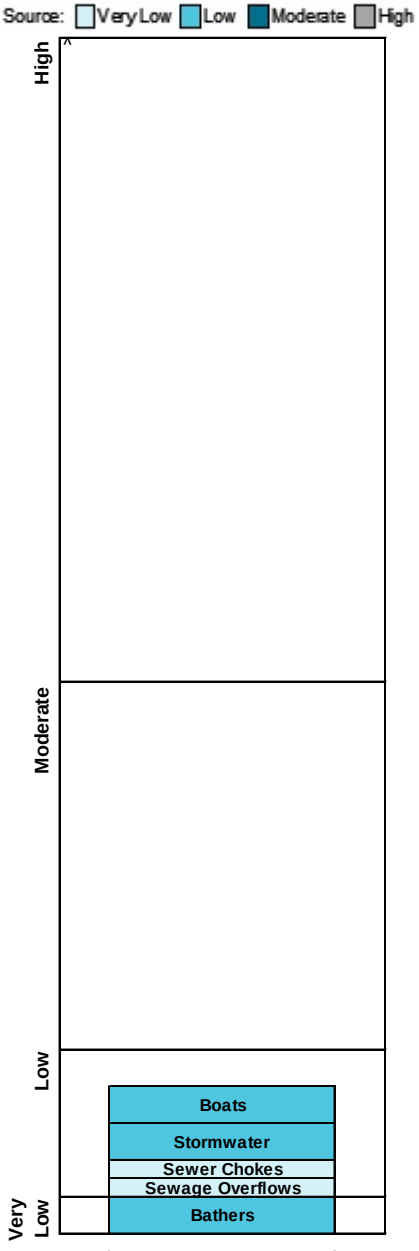
Paradise Beach Baths are a 30 by 20 metre netted swimming enclosure on the eastern foreshore of Pittwater, backed by a narrow sandy beach and a small park.

The Beach Suitability Grade of Good indicates that microbial water quality is suitable for swimming most of the time but the water may be susceptible to pollution from several minor sources of faecal contamination.

The response to rainfall graph indicates that enterococci levels increased with increasing rainfall, often exceeding the safe swimming limit in response to 5mm of rainfall or more.

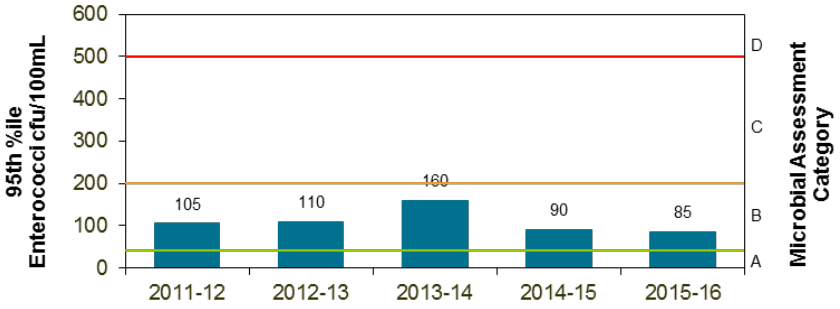
The site has been monitored since 1996. Microbial water quality improved slightly in 2000–2001 when much of the catchment was connected to reticulated sewerage.

Sanitary Inspection: **Low**



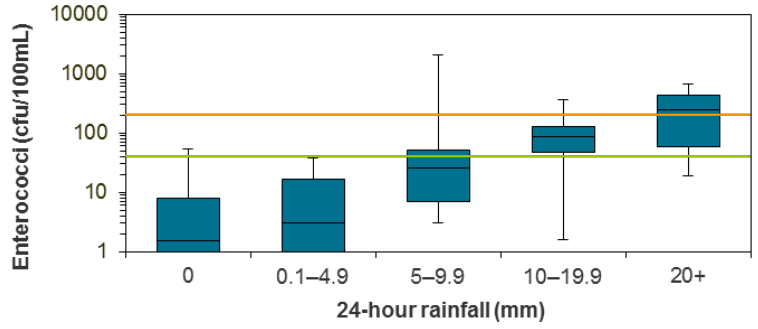
Microbial Assessment: **B**

Monitoring period for 2015–16 result is December 2013 to April 2016.

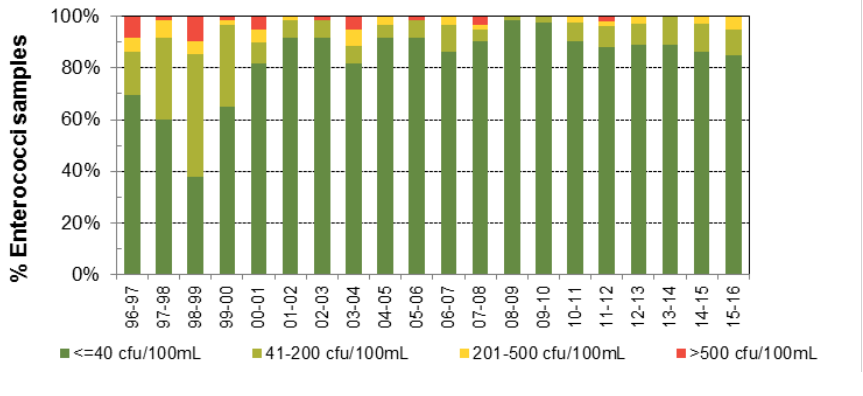


Response to rainfall

Rainfall from Avalon rain gauge

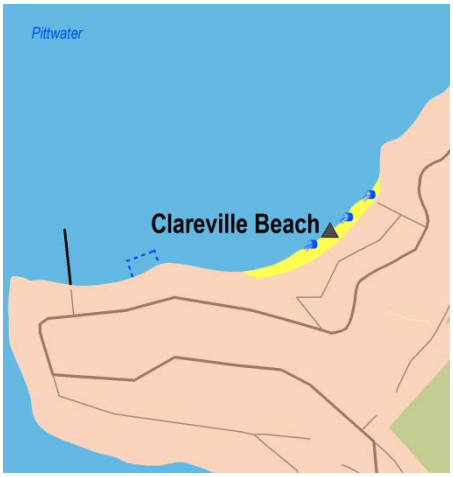


Trends in enterococci data through time



Clareville Beach

Beach Suitability Grade: G



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

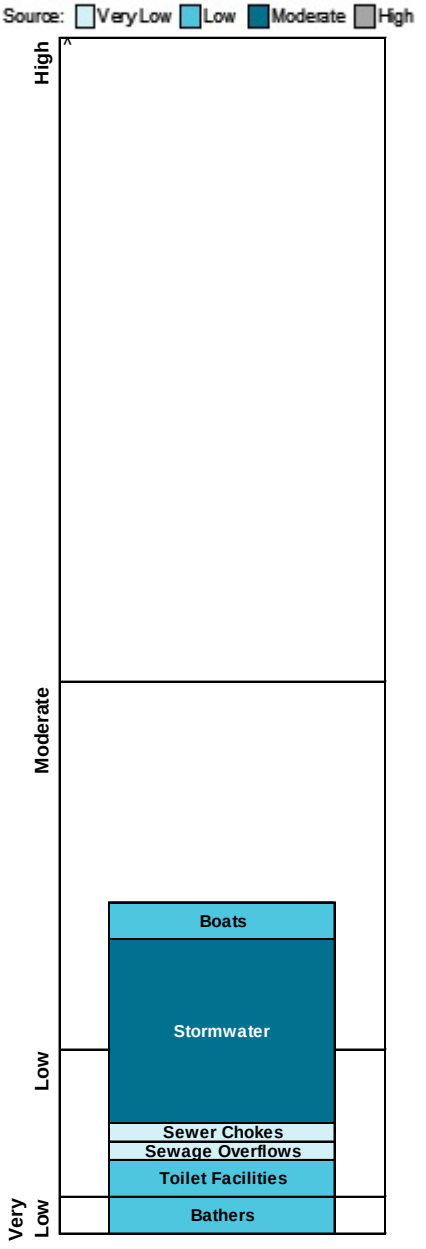
Clareville Beach is a narrow 250 metre long beach located on the eastern foreshore of Pittwater. A grassy park area backs the beach, with picnic facilities at the northern end.

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

The response to rainfall graph indicates that enterococci levels increased with increasing rainfall, often exceeding the safe swimming limit in response to 5mm of rainfall or more.

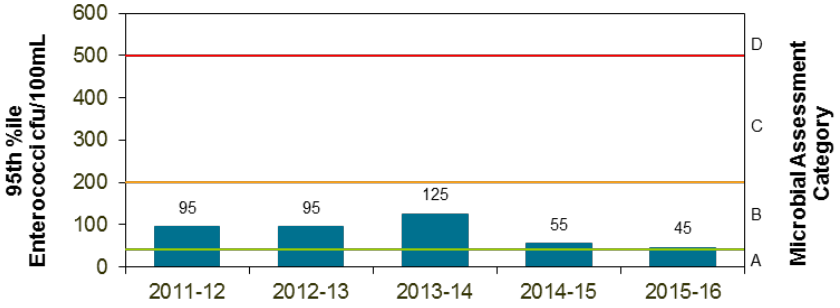
The site has been monitored since 1995. Microbial water quality improved in 2000–2001 when much of the catchment was connected to reticulated sewerage.

Sanitary Inspection: **Moderate**



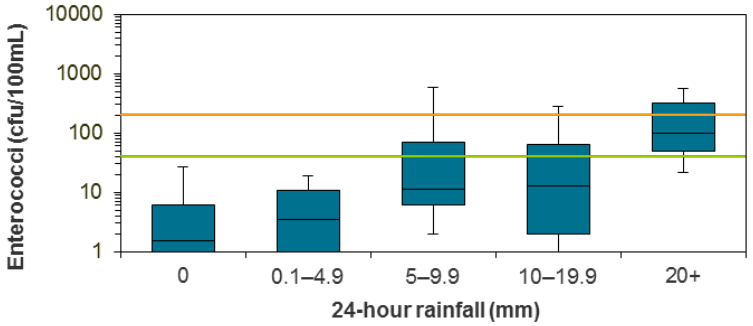
Microbial Assessment: **B**

Monitoring period for 2015–16 result is December 2013 to April 2016.

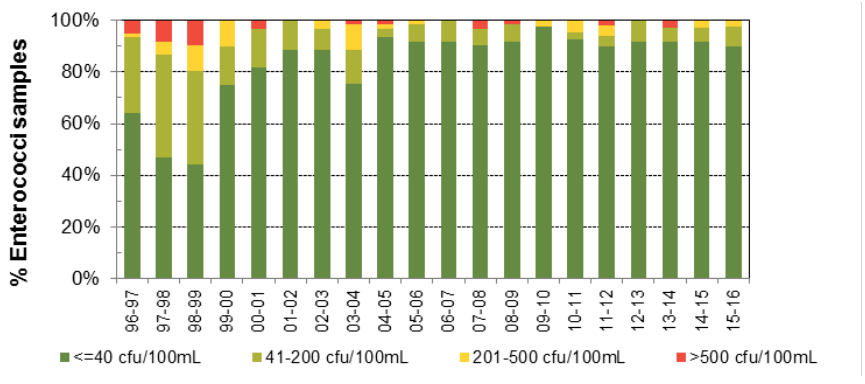


Response to rainfall

Rainfall from Avalon rain gauge

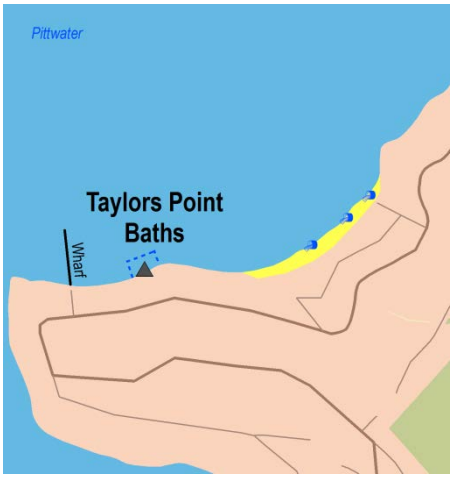


Trends in enterococci data through time



Taylors Point Baths

Beach Suitability Grade: G



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

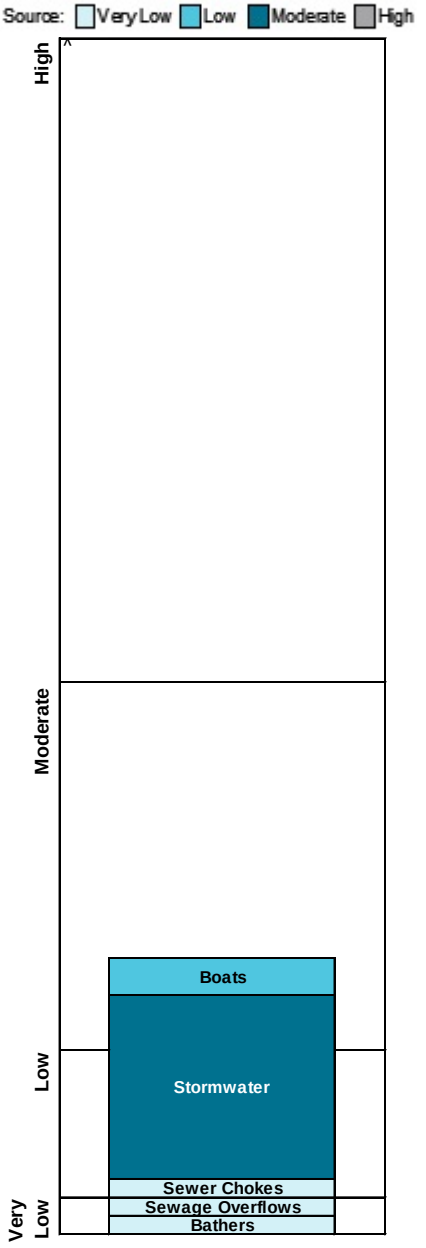
Taylors Point Baths are a 15 by 20 metre netted swimming enclosure on the eastern foreshore of Pittwater. The baths are backed by a narrow beach with a small grassed area.

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

The response to rainfall graph indicates that enterococci levels increased with increasing rainfall, often exceeding the safe swimming limit in response to 10mm of rainfall or more.

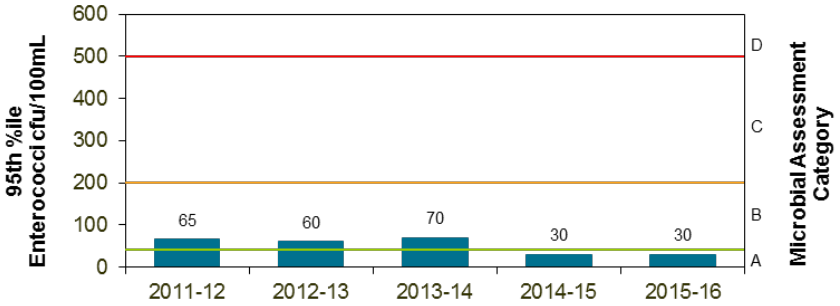
The site has been monitored since 2010 and water quality has generally been of a high standard.

Sanitary Inspection: **Moderate**



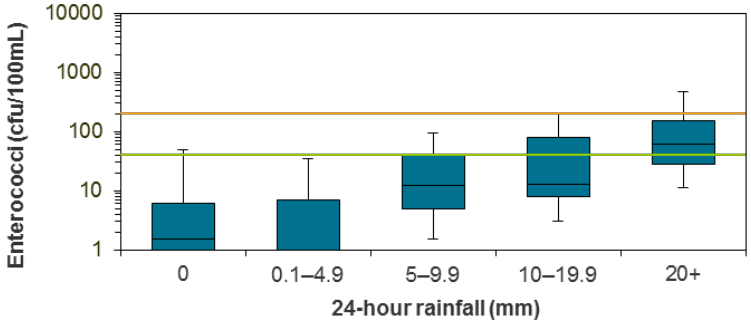
Microbial Assessment: **A**

Monitoring period for 2015–16 result is December 2013 to April 2016.

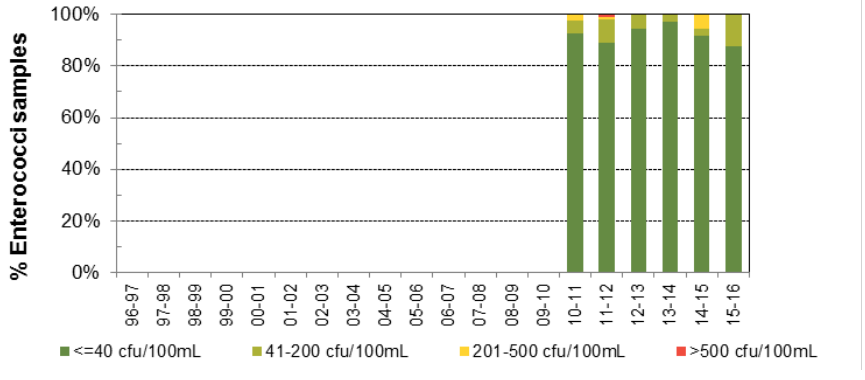


Response to rainfall

Rainfall from Avalon rain gauge



Trends in enterococci data through time



Bayview Baths

Beach Suitability Grade: P

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

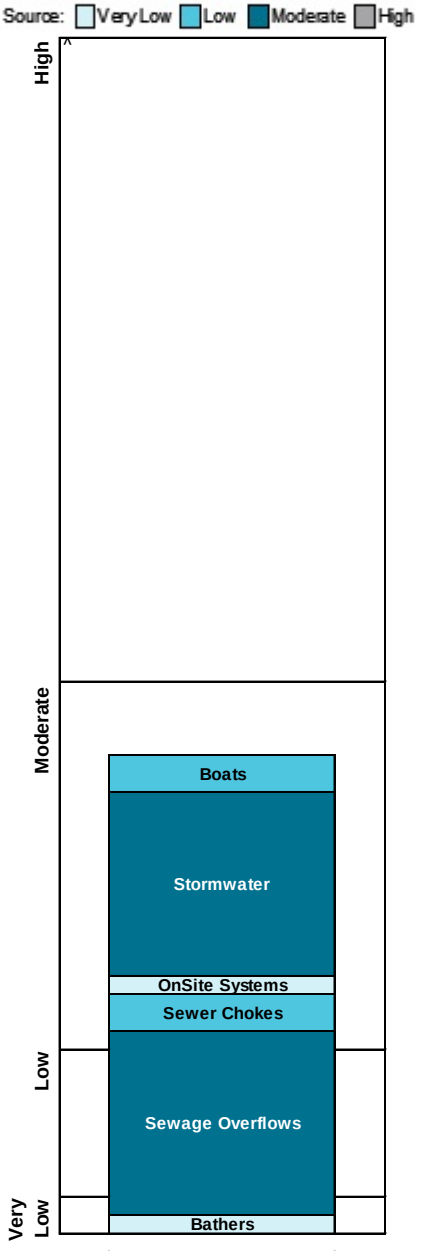
Bayview Baths are a 20 by 40 metre netted swimming enclosure on the southern foreshore of Pittwater. The baths are backed by a narrow beach with a small park. The baths are considerably silted up.

The Beach Suitability Grade of Poor indicates that microbial water quality is influenced by faecal pollution, usually triggered by rainfall, with potential faecal contamination from stormwater and sewage overflows.

The response to rainfall graph indicates that enterococci levels increased with increasing rainfall, regularly exceeding the safe swimming limit in response to 5mm of rainfall or more.

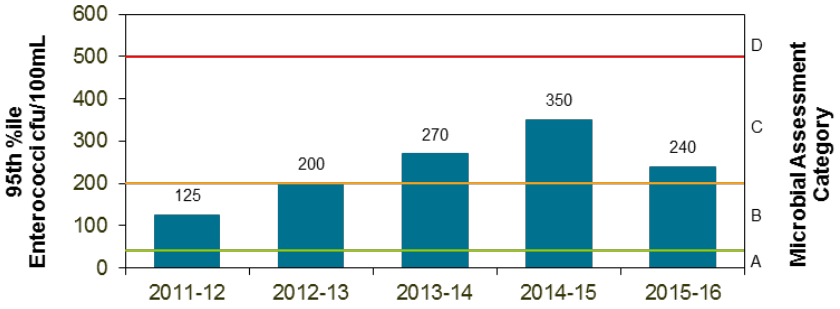
The site has been monitored since 1995. Microbial water quality improved after 2000–2001 when much of the catchment was connected to reticulated sewerage.

Sanitary Inspection: **Moderate**



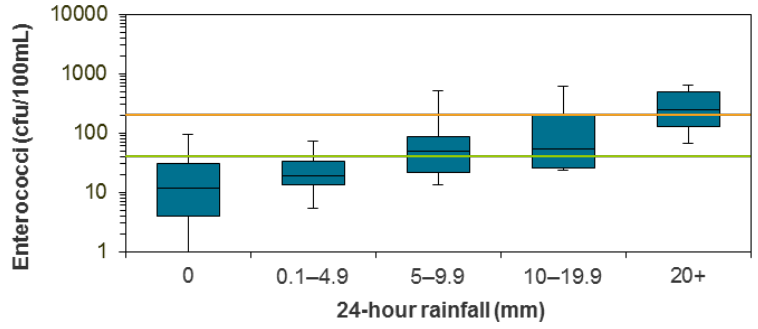
Microbial Assessment: **C**

Monitoring period for 2015–16 result is December 2013 to April 2016.

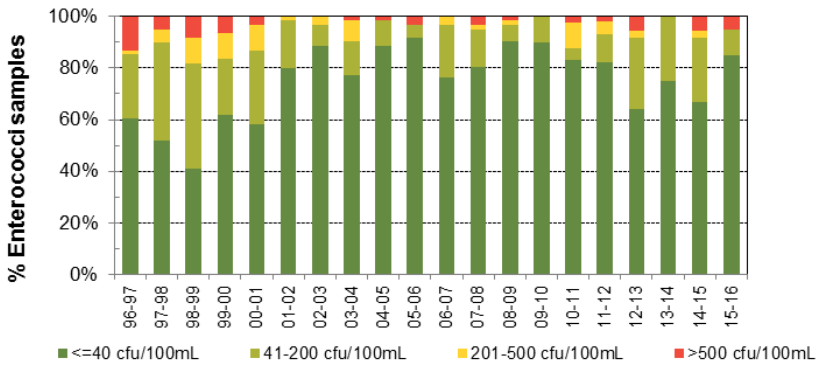


Response to rainfall

Rainfall from Avalon rain gauge



Trends in enterococci data through time



Elvina Bay

Beach Suitability Grade: VG

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

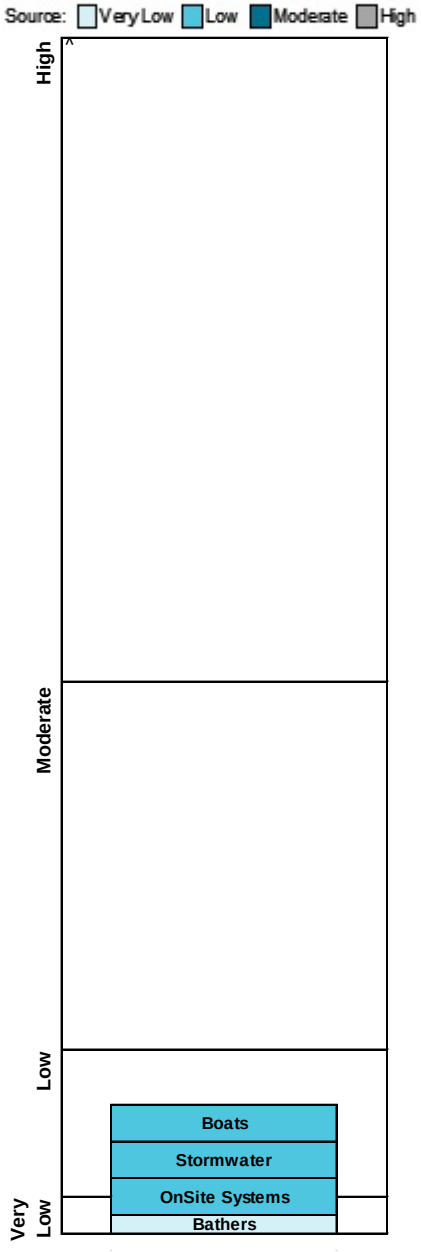
Elvina Bay is on the south-western foreshore of Pittwater. The swimming area is not netted. Water quality samples are collected from Elvina South Wharf on the southern side of Elvina Bay.

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

The response to rainfall graph indicates that enterococci levels increased with increasing rainfall, often exceeding the safe swimming limit in response to 10mm of rainfall or more.

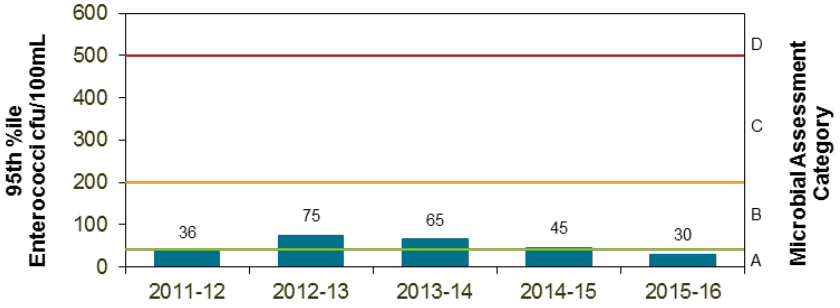
Microbial water quality improved slightly in 2000–2001 when much of the eastern side of Pittwater was connected to reticulated sewerage.

Sanitary Inspection: **Low**



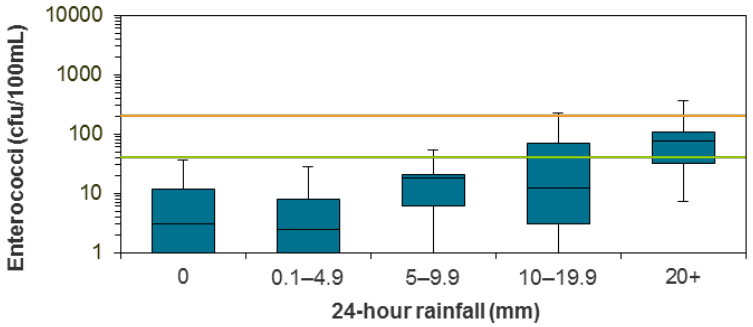
Microbial Assessment: **A**

Monitoring period for 2015–16 result is December 2013 to April 2016.

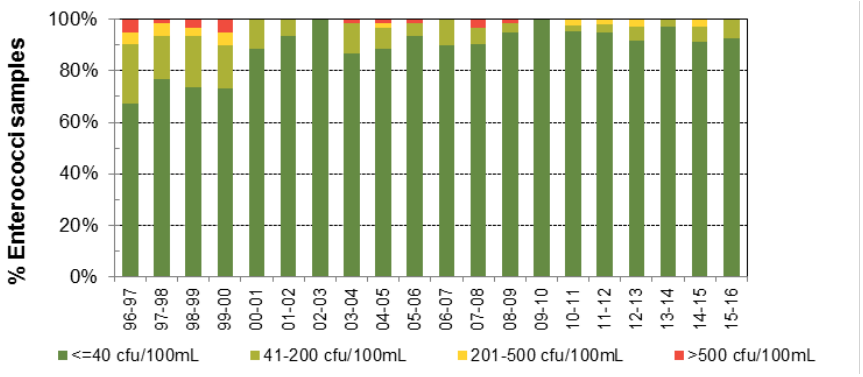


Response to rainfall

Rainfall from Avalon rain gauge



Trends in enterococci data through time



North Scotland Island

Beach Suitability Grade: G

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

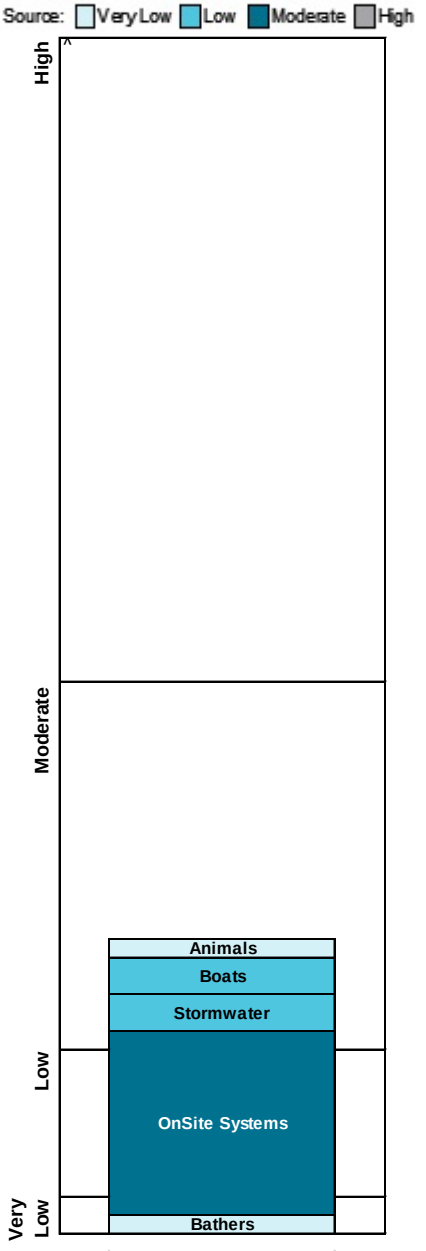
The North Scotland Island swimming site is a 15 by 50 metre netted enclosure located on the north side of Scotland Island in Pittwater. A park with picnic facilities backs the swimming area.

The Beach Suitability Grade of Good indicates that microbial water quality is suitable for swimming most of the time but the water may be susceptible to pollution from several potential sources of faecal contamination including on-site sewage management systems.

The response to rainfall graph indicates that enterococci levels increased with increasing rainfall, often exceeding the safe swimming limit in response to 20mm of rainfall or more.

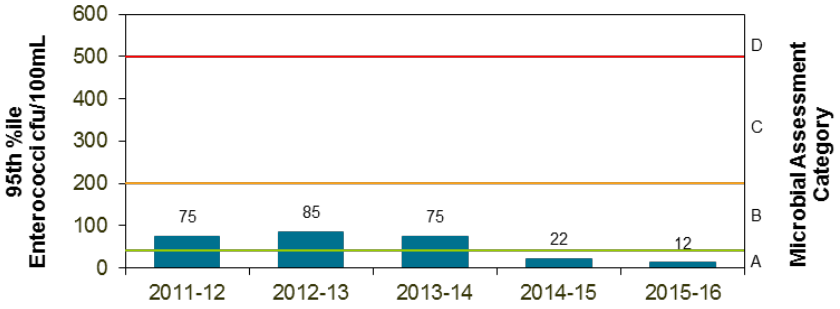
The site has been monitored since 1995. Microbial water quality improved slightly in 2000–2001 when much of the eastern side of Pittwater was connected to reticulated sewerage.

Sanitary Inspection: **Moderate**



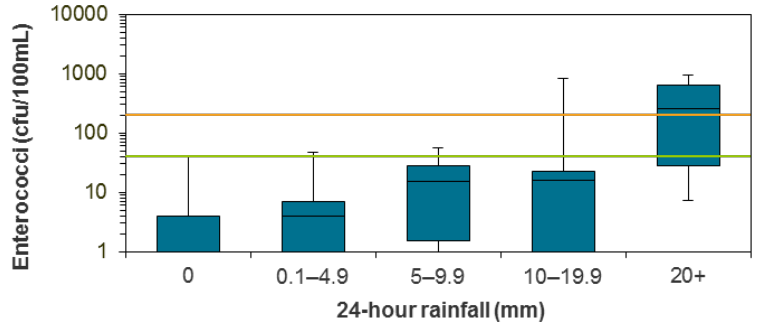
Microbial Assessment: **A**

Monitoring period for 2015–16 result is December 2013 to April 2016.

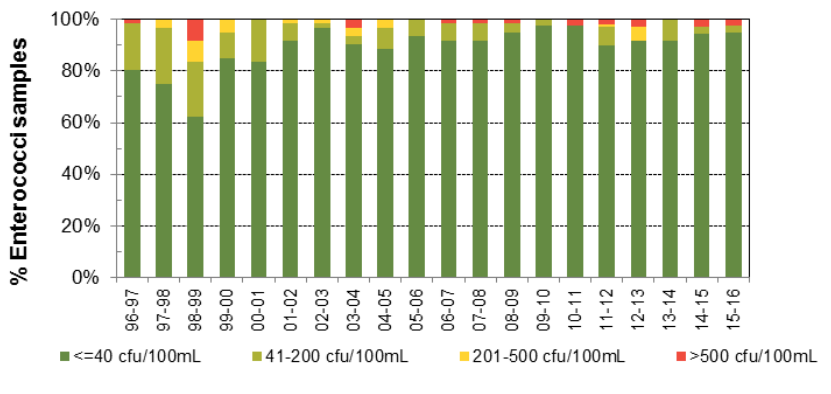


Response to rainfall

Rainfall from Avalon rain gauge



Trends in enterococci data through time



South Scotland Island

Beach Suitability Grade: G

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

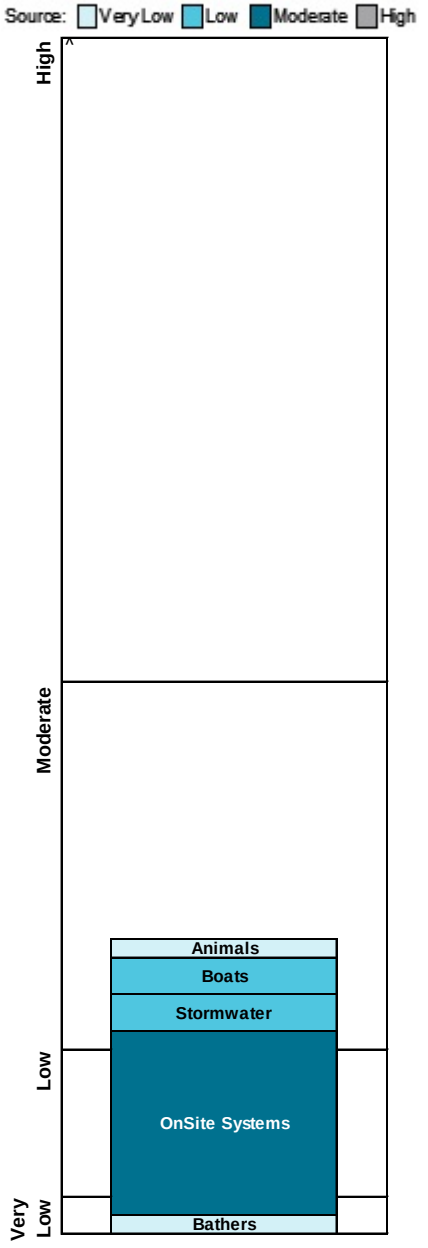
The South Scotland Island swimming site is located at Carols Wharf on the southern side of Scotland Island. The location is not netted and is backed by a reserve.

The Beach Suitability Grade of Good indicates that microbial water quality is suitable for swimming most of the time but the water may be susceptible to pollution from several potential sources of faecal contamination including on-site sewage management systems.

The response to rainfall graph indicates that enterococci levels increased with increasing rainfall, often exceeding the safe swimming limit in response to 20mm of rainfall or more.

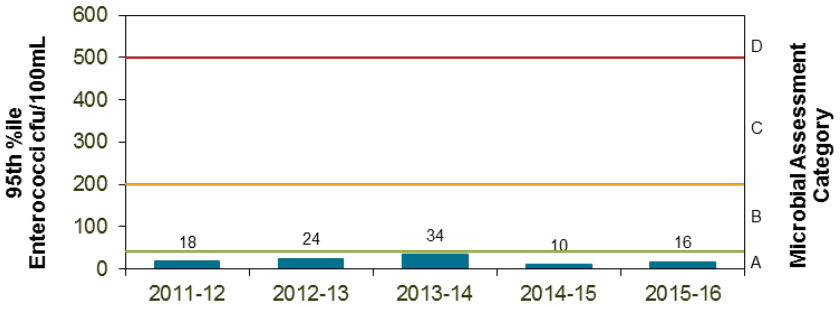
The site has been monitored since 1996. Microbial water quality improved slightly in 2000–2001 when much of the eastern side of Pittwater was connected to reticulated sewerage.

Sanitary Inspection: **Moderate**



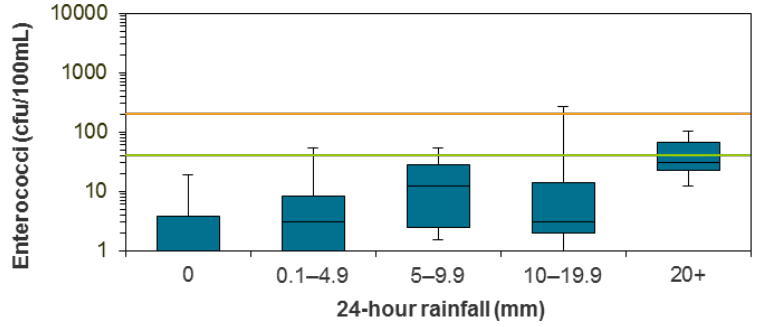
Microbial Assessment: **A**

Monitoring period for 2015–16 result is December 2013 to April 2016.

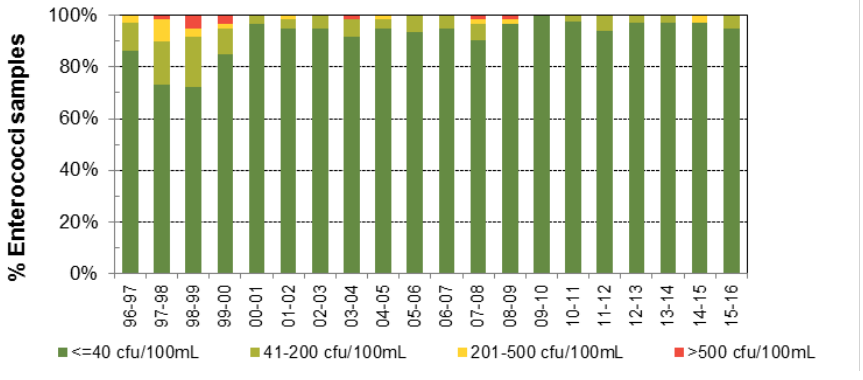


Response to rainfall

Rainfall from Avalon rain gauge



Trends in enterococci data through time



The Basin

Beach Suitability Grade: VG

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

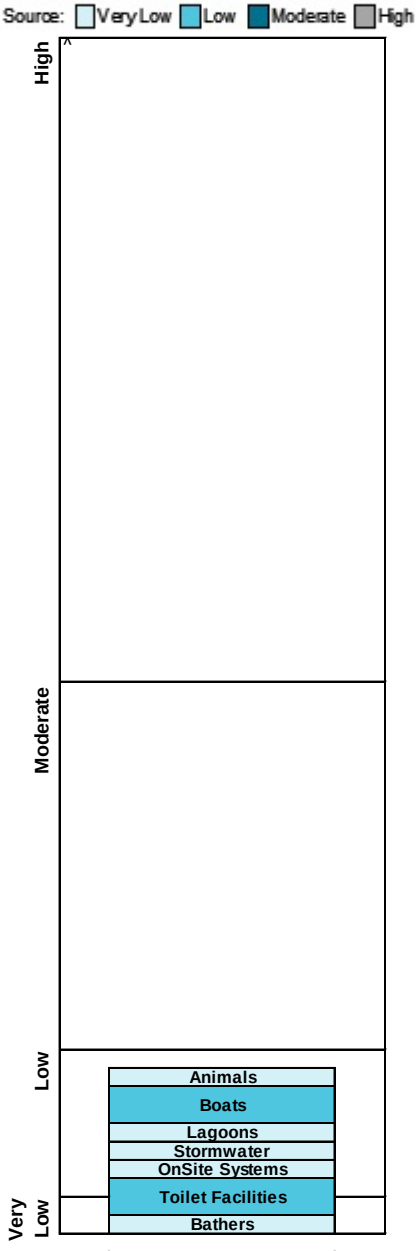
The Basin is a 500 metre sandy beach on the western side of Pittwater, backed by Ku-ring-gai Chase National Park. The sampling site is located at The Basin Wharf. The area is very popular and is also known as Coasters Retreat.

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

The response to rainfall graph indicates that enterococci levels increased slightly with increasing rainfall, but generally remained below the safe swimming limit across all rainfall categories.

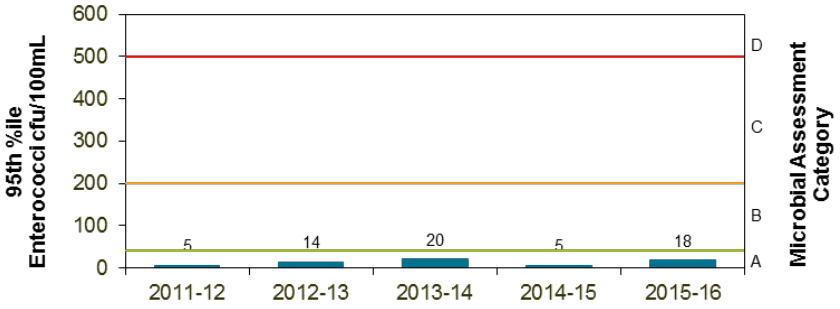
The site has been monitored since 1999 and water quality has generally been of a very high standard.

Sanitary Inspection: **Low**



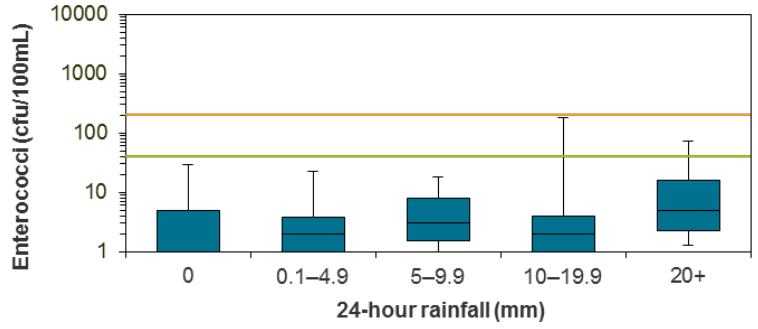
Microbial Assessment: **A**

Monitoring period for 2015–16 result is December 2013 to April 2016.

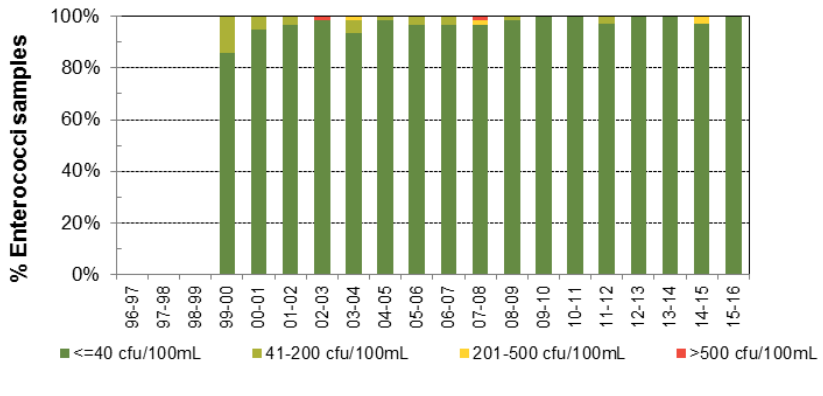


Response to rainfall

Rainfall from Avalon rain gauge

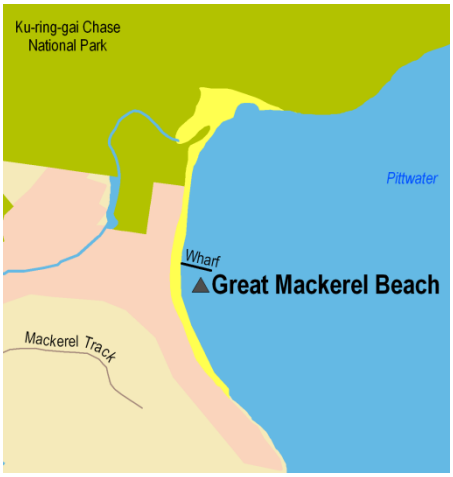


Trends in enterococci data through time



Great Mackerel Beach

Beach Suitability Grade: VG



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

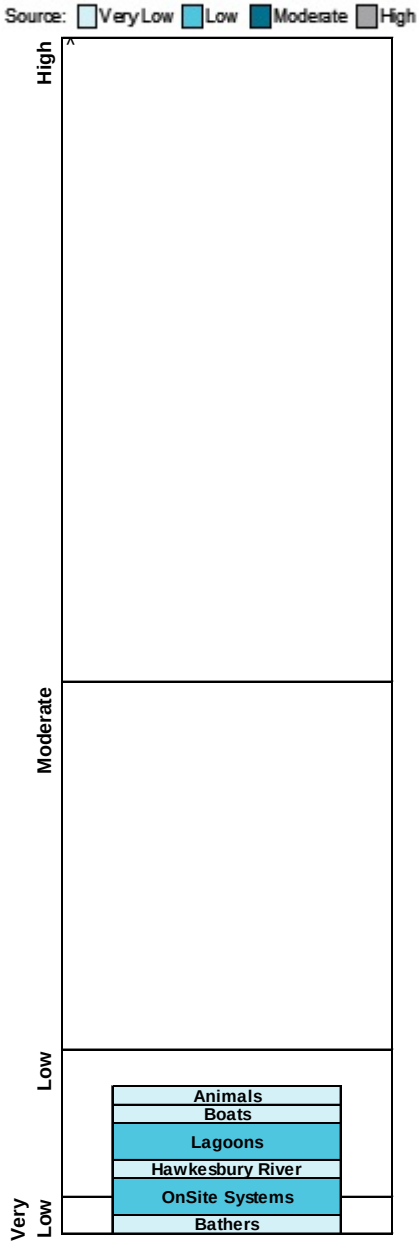
Great Mackerel Beach is a 500 metre long sandy beach on the north-western side of Pittwater. The northern end is backed by Ku-ring-gai Chase National Park and the southern end by a residential area. Samples are collected in the centre of the beach near Mackerel Beach Wharf.

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

The response to rainfall graph indicates that enterococci levels increased slightly with increasing rainfall, often exceeding the safe swimming limit in response to 20mm of rainfall or more.

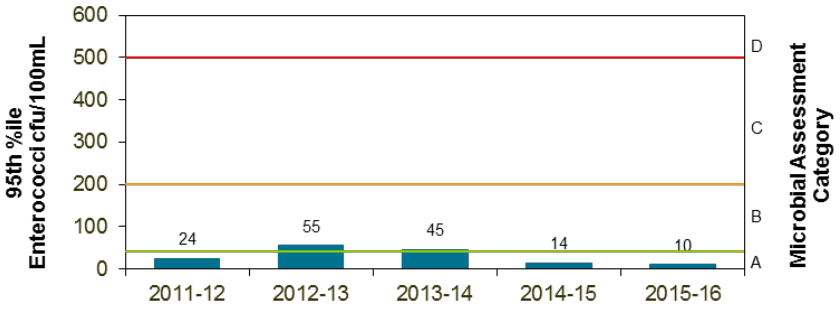
The site has been monitored since 1999. Water quality has generally been of a very high standard, with variation in results due to rainfall.

Sanitary Inspection: **Low**



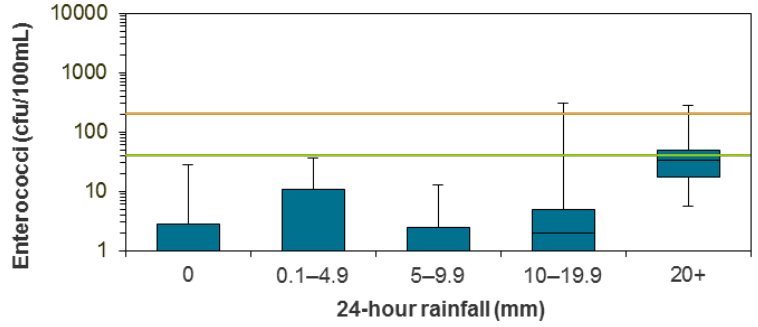
Microbial Assessment: **A**

Monitoring period for 2015–16 result is December 2013 to April 2016.

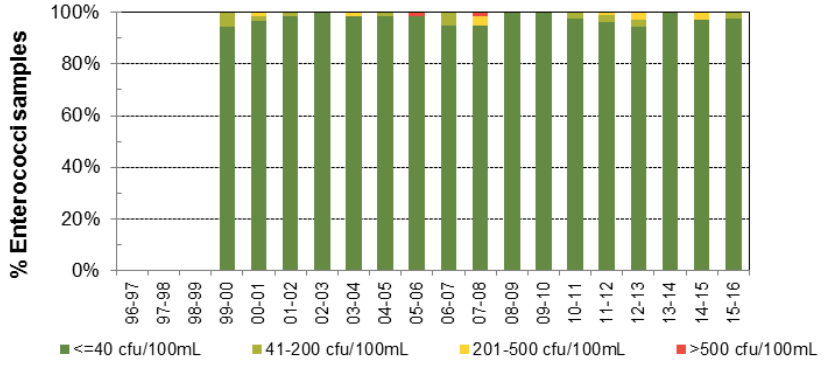


Response to rainfall

Rainfall from Avalon rain gauge



Trends in enterococci data through time



Central Sydney (Bondi to Little Bay & Sydney Harbour)

State of the Beaches 2015–2016

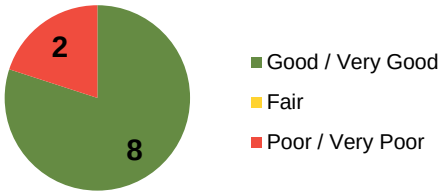
Overall results

Percentage of sites graded as Good or Very Good:

82%	83%	86%	**83%**
2012–13	2013–14	2014–15	2015–16

Thirty of the 36 swimming sites were graded as Very Good or Good in 2015–2016. This was a fall in performance from the previous year, with frequent wet weather and significant storm events impacting water quality.

Ocean beaches



Eight of 10 ocean beaches were graded as Very Good or Good.

Clovelly Beach and Maroubra Beach 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.

Bondi, Tamarama, Bronte, Gordons Bay, South Maroubra and Little Bay beaches were graded as Good. These sites were suitable for swimming during dry weather conditions, but elevated enterococci levels were often recorded following rainfall. Swimming should be avoided at these sites during and for up to one day following rainfall or when there are signs of stormwater pollution such as discoloured water or floating debris.

Coogee Beach and Malabar Beach were graded as Poor, downgraded from Good in 2014–2015. Water quality was mostly good during dry weather conditions, however the impacts of rainfall are more apparent at these beaches.
While the Coogee Beach generally had good water quality during dry weather, elevated enterococci levels were regularly measured following low levels of rainfall. Water quality was impacted by stormwater associated with frequent rainfall events during the assessment period, including the wettest January for Sydney since 1988. The impact of these events was enough to just breach the threshold from Good to Poor however did not significantly increase the risk to public health from the previous year. With the inclusion of many wet weather results, Coogee Beach is now positioned at the top of the Poor grade instead of the bottom of the Good grade. Despite the Poor grade, bacteria levels in 77% of all samples collected during 2015–2016 were within the safe swimming limit. In dry weather

Best beaches

Clovelly Beach, Maroubra Beach and **Nielsen Park**

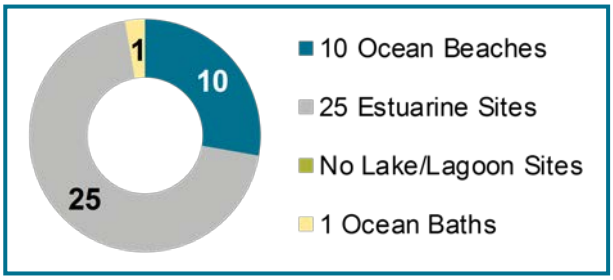
These sites had excellent water quality and were suitable for swimming almost all of the time.

36 sites

every 6 days*

1569 samples

year round*



* 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.

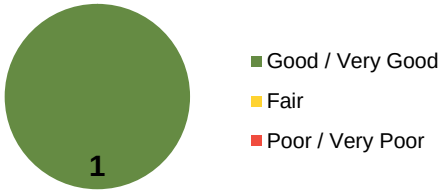
See **How to Read this Report** for explanations of graphs and Beach Suitability Grades.

conditions, with no rainfall recorded in the previous 24 hours, 94% of samples were within the safe swimming limit.

Malabar Beach was impacted by stormwater associated with significant rainfall events during the assessment period, including the wettest January for Sydney since 1988. 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. Despite the Poor grade, bacteria levels in 71% of all samples collected during 2015–2016 were within the safe swimming limit. In dry weather conditions, with no rainfall recorded in the previous 24 hours, 76% of samples were within the safe swimming limit.

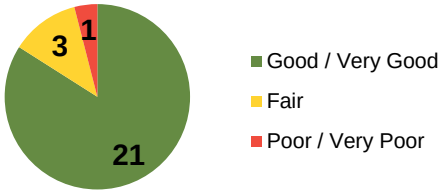
To reduce of the risk of contracting swimming-related illnesses at Coogee and Malabar beaches, avoid swimming during and for up to one day after rainfall and carefully follow the pollution advisories in the daily Beachwatch Pollution Forecast (www.environment.nsw.gov.au/beach).

Ocean baths



South Maroubra Rockpool was added to the program in 2014 and continues to be graded as Good. This site was suitable for swimming during dry weather conditions, but elevated enterococci levels were often recorded following rainfall. Swimming at this site should be avoided during and for up to one day following rainfall, when the stormwater drain is discharging to the site or when there are signs of stormwater pollution such as discoloured water or floating debris.

Estuarine beaches



Nielsen Park in Sydney Harbour was graded as Very Good. This site had excellent water quality and was suitable for swimming almost all of the time. Elevated enterococci levels were occasionally recorded following heavy rainfall and swimming should be avoided at these times.

A further 20 of the 25 swimming locations in Sydney Harbour were graded as Good: Watsons Bay, Parsley Bay, Rose Bay Beach, Murray Rose Pool, Dawn Fraser Pool, Chiswick Baths, Cabarita Beach, Tambourine Bay, Woolwich Baths, Woodford Bay, Greenwich Baths, Hayes Street Beach, Clifton Gardens, Balmoral Baths, Edwards Beach, Chinamans Beach, Forty Baskets Pool, Fairlight Beach, Manly Cove and Little Manly Cove. Tambourine Bay in the lower Lane Cove River improved in performance this year being upgraded to Good from Poor in 2014–2015. These sites had mostly good water quality, although elevated enterococci levels were recorded following rainfall.

Three swimming locations were graded as Fair: Northbridge Baths, Gurney Crescent Baths and Clontarf Pool. These sites had generally good water quality, but had more significant potential sources of microbial contamination.

Davidson Reserve in the upper reaches of Middle Harbour was graded as Poor, a similar result to previous years. Although microbial water quality at this site is generally suitable for swimming during dry weather conditions, elevated enterococci levels were frequently measured following light rainfall. Davidson Reserve also has relatively low levels of tidal flushing which increases the time needed to disperse and dilute pollution inputs.

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 stormwater pollution such as discoloured water or floating debris.

Management

Ocean beaches

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 Water relined a 154m section of sewer main along Long Bay, behind Malabar Beach, under their Avoid Fail Program.

Waverley and Randwick City councils and Sydney Water collaborated to do intense dry weather monitoring of stormwater drains to identify sewer leaks. Leaks from public sewers are repaired by Sydney Water and leaks from private sewers are addressed by the relevant council.

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

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). Council is currently in the design phase of a new stormwater harvesting system to be completed at Maroubra foreshore before June 2017 to improve the water quality at Maroubra Beach and South Maroubra Rockpool.

Randwick City Council maintains 34 GPTs on stormwater lines leading to the local bays, which are all cleaned regularly. In the last year, approximately 240 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.

The Bronte Stormwater Harvesting Scheme collects and treats stormwater which is then re-used for toilets, park irrigation, ocean pool cleaning, and general cleaning of public places. 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 is expected to save 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.

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

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.

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 STP) 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.

North Sydney Harbour

The Northside Storage Tunnel was constructed by Sydney Water in 2000 and captures wet weather overflows from the four

major overflow sites at Lane Cove, Quakers Hat Bay, Tunks Park and Scotts Creek. The tunnel has reduced the frequency of sewage overflows to less than 20 in an average 10-year period. Since the commissioning of the tunnel, about 90.1 billion litres of diluted sewage has been prevented from entering Sydney Harbour[1].

In March 2015, Sydney Water completed works to reduce the occurrence of wet weather overflows in the vicinity of Northbridge Baths.

Sydney Water has inspected, cleaned and repaired sewer mains on the northern 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.

Mosman Council's Botanic Road Stormwater Re-use Scheme is an underground storage system which 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 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.

Mosman Council implemented 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. An audit of parks and reserves in January 2016 showed a 63% decrease in the amount of dog poo left in-situ compared to the commencement of the education campaign two years prior.

Willoughby City Council has installed signage at Northbridge Baths advising not to swim during rain and up to 48 hours after the rain has ceased due to the potential for pollution from stormwater. Ongoing education continues in the Sailors Bay catchment. Council has a Stormwater Asset Management Plan to improve and manage stormwater infrastructure including the maintenance of GPTs.

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.

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 HarbourCare volunteers, who are concerned about pollution in Sydney Harbour and its effect on marine and bird life, to clean up and remove rubbish from their many small beaches.

South Sydney Harbour

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. Our Water for our Community stormwater recycling scheme at Cintra Park, completed in October 2015, harvests and re-uses stormwater for irrigation. This will reduce the City of Canada Bay's reliance on potable water by 180 million litres each year and improve the quality of runoff into Canada Bay itself.

Woollahra Municipal Council's Environmental and Infrastructure Levy funds a range of projects aimed at protecting the local environment. Projects include upgrading infrastructure; installing and maintaining GPTs and pit baskets; flow diversion structures to reduce sediment loads; litter nets; bio-retention systems to remove contaminants from stormwater; porous paving infiltration systems; and stormwater harvesting systems, as well as conducting water quality monitoring, research and coastal management planning.

Council is in the process of developing a Coastal Zone Management Plan which will direct management of the Woollahra coastal zone, including the management of stormwater quality. Council did site-specific stormwater quality monitoring at Rose Bay, Parsley Bay and Gibsons Beach which resulted in the identification and repair of a dry weather pollution source. Council is continuing to work with Sydney Water on improving the water quality at Rose Bay. In addition, street sweeping, weekly beach cleaning, riparian vegetation and terrestrial bushland regeneration activities continue to contribute to improved

[1] *Northside storage tunnel – Tunnel status*. Sydney Water, Parramatta, NSW. [Available at sydneywater.com.au/SW/water-the-environment/how-we-manage-sydney-s-water/wastewater-network/northside-storage-tunnel/tunnel-status/index.htm. Accessed on 23/06/16]

stormwater quality at Woollahra's beaches.

Sydney Water and Woollahra Municipal Council operate GPTs throughout the Woollahra local government area.

Woollahra Municipal Council is undertaking an ongoing stormwater network condition assessment program, with approximately 35% of the stormwater network already inspected and rated.

Sydney Water has inspected, cleaned and repaired sewer mains on about half of the 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 asked to remedy the problem.

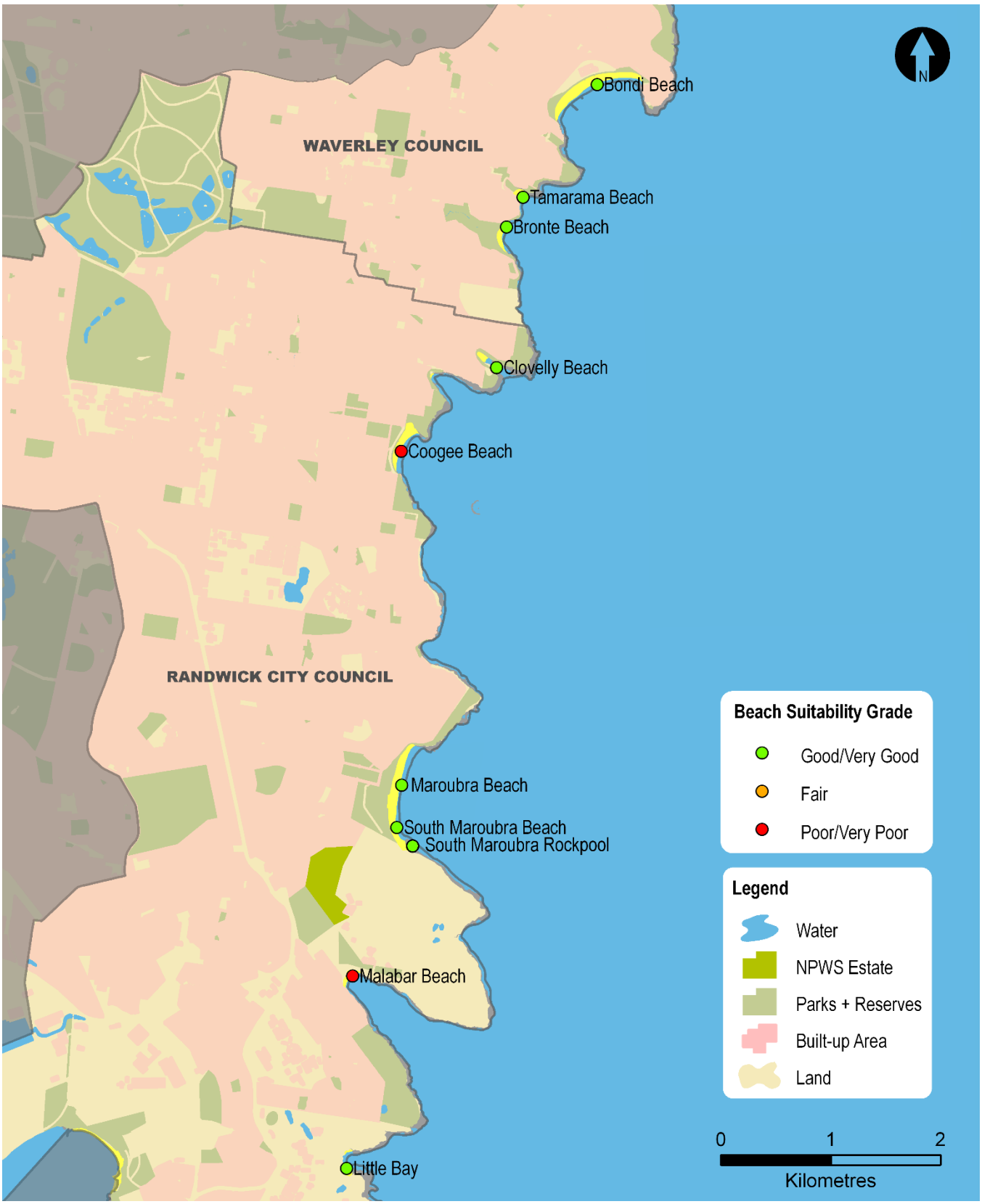
Leichardt Council is in discussions with Sydney Water to design a bioretention system and re-use system for Easton Park. It is proposed that the stormwater will be collected, filtered and cleaned through the raingarden and GPT, and transported to the existing tank for irrigation of the sports field at Easton Park.

Leichardt Council has engaged a consultant to review the viability of four new GPTs in locations across the local government area.

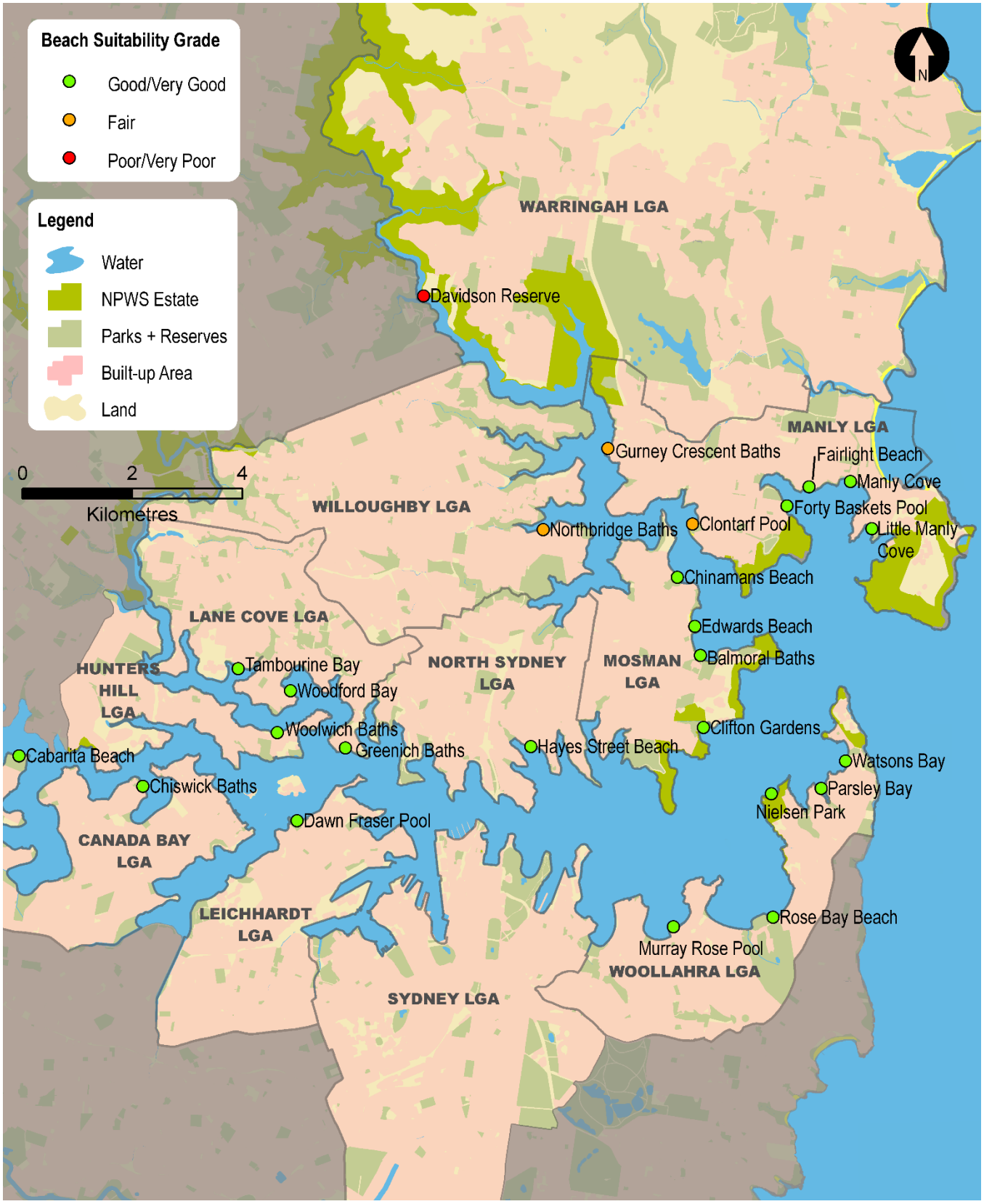
Leichhardt Council has finalised the design of the Blackmore Oval Constructed Wetland and Stormwater Harvesting project. Once implemented, cleaner water from the City West Link and adjoining catchment will be discharged into the Hawthorne Canal that runs into the Parramatta River. The stormwater harvesting will collect base flow, treat it and irrigate the Blackmore Oval, significantly reducing the potable water demand. Council is pursuing the construction of the Blackmore Oval Constructed Wetland, however this is dependent on Roads and Maritime Services, with whom they are currently in discussions.

Leichhardt Council has constructed a GPT in Birchgrove Oval to improve the quality of stormwater flow to Sydney Harbour. Council engaged a specialist consultant to audit existing GPTs and has received a report specifying the rectification work required. Council is reviewing the proposed works and will aim to undertake any necessary work in the future.

Leichhardt Council has recently completed the Taylor Street raingardens in Annandale. The works included reinstating the filter bed and improving the drainage system enabling the raingarden to work more efficiently and discharge cleaner water into Johnstons Creek, which drains to Rozelle Bay. Council has constructed new raingardens at Cove Street, Birchgrove; Arguimbau Street, Annandale; Albert Street, Leichhardt; Annandale/ Piper Street, Annandale. Council has committed to construct new raingardens at Yeend Street, Birchgrove and Annandale Street, Annandale.



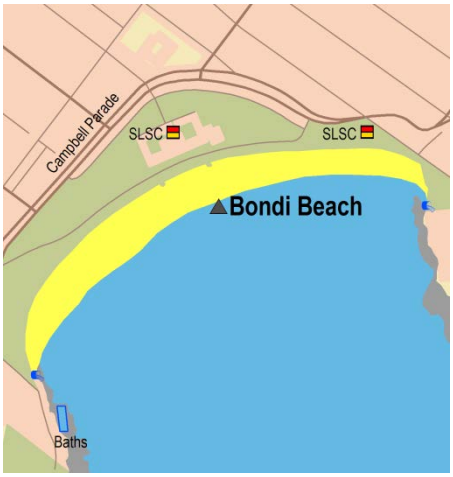
Sampling sites and Beach Suitability Grades at Sydney's ocean beaches



Sampling sites and Beach Suitability Grades in Sydney Harbour

Bondi Beach

Beach Suitability Grade: G



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

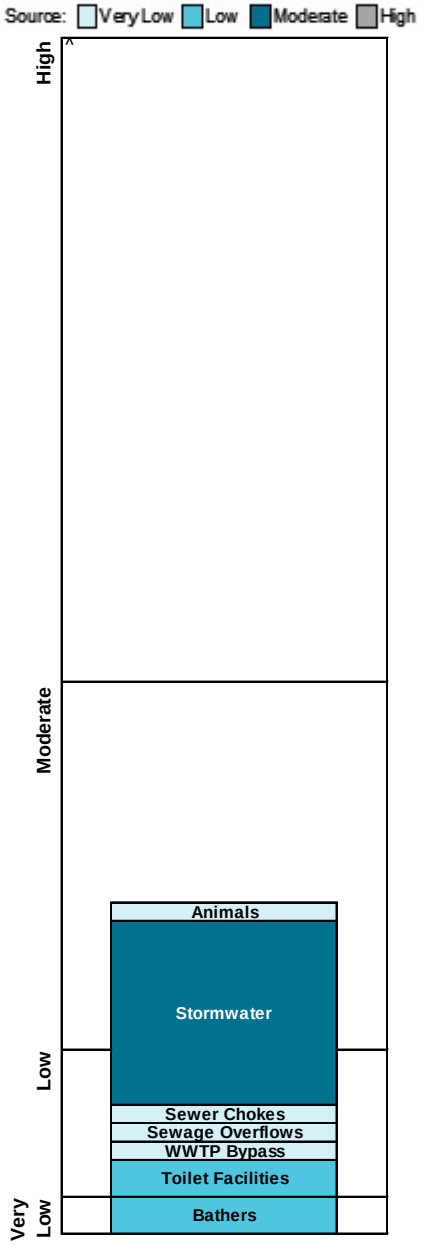
Bondi Beach is 800 metres long and backed by a promenade, carpark and parklands. Beach conditions are safest at the northern end and lifeguards patrol the beach year round.

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

The response to rainfall graph indicates that enterococci levels increased with increasing rainfall, often exceeding the safe swimming limit in response to 5mm of rainfall or more.

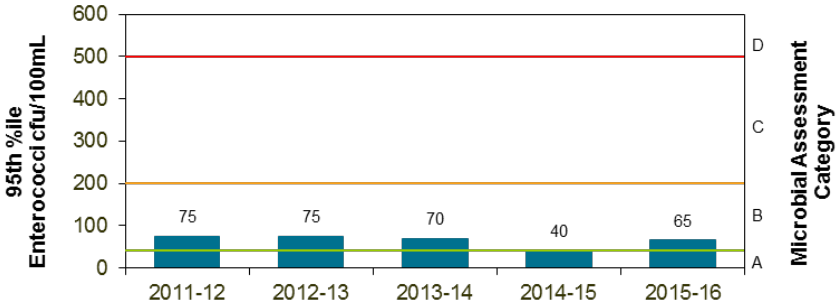
The site has been monitored since 1989.

Sanitary Inspection: **Moderate**



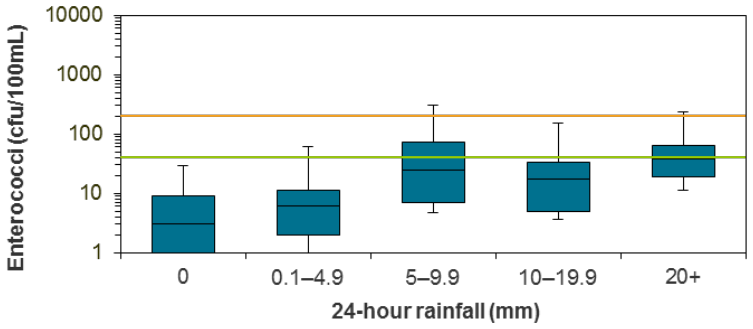
Microbial Assessment: **B**

Monitoring period for 2015–16 result is August 2014 to April 2016.

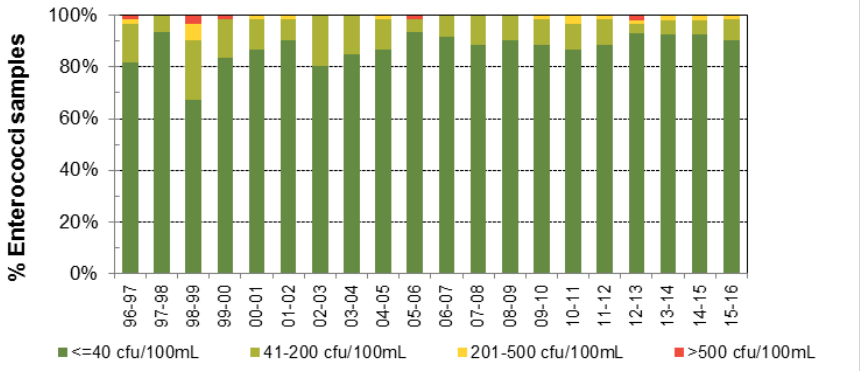


Response to rainfall

Rainfall from Waverly rain gauge

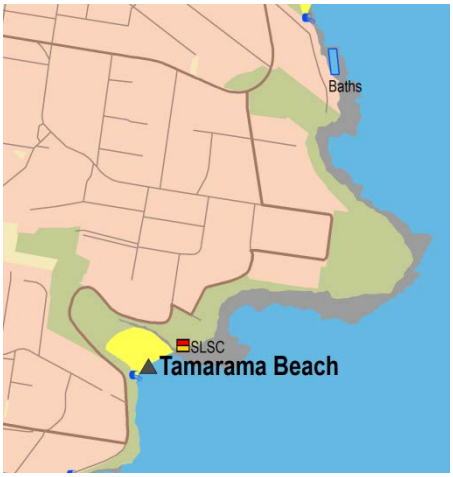


Trends in enterococci data through time



Tamarama Beach

Beach Suitability Grade: G



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

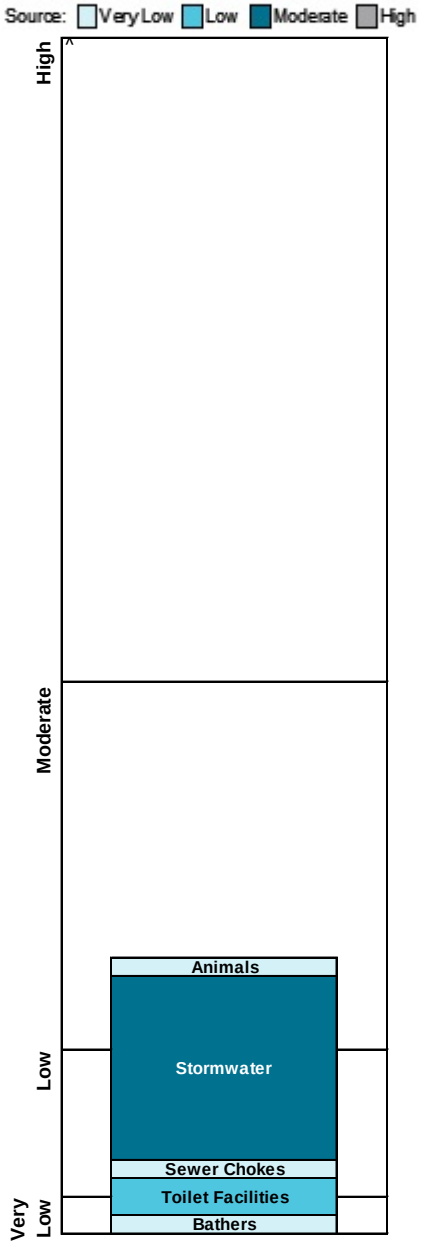
Tamarama Beach is approximately 80 metres long and is closed to board riders during patrol hours. Swimming can be very hazardous because of the rips. Lifeguards patrol the beach from late September to April.

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

The response to rainfall graph indicates that enterococci levels increased with increasing rainfall, often exceeding the safe swimming limit in response to 5mm of rainfall or more.

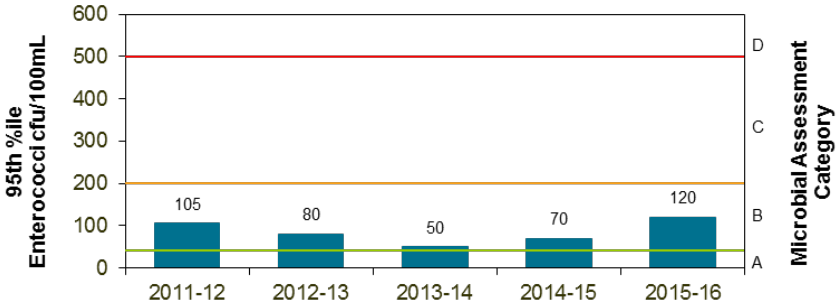
The site has been monitored since 1989.

Sanitary Inspection: **Moderate**



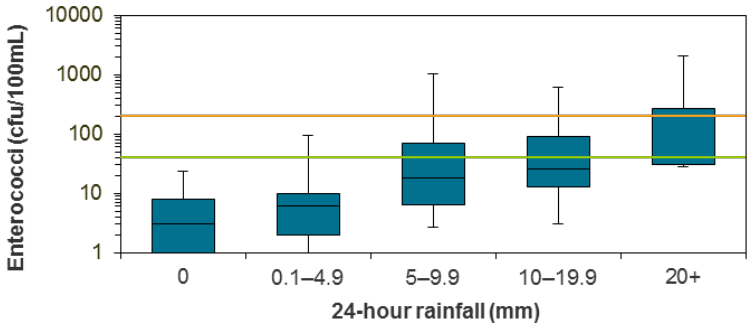
Microbial Assessment: **B**

Monitoring period for 2015–16 result is August 2014 to April 2016.

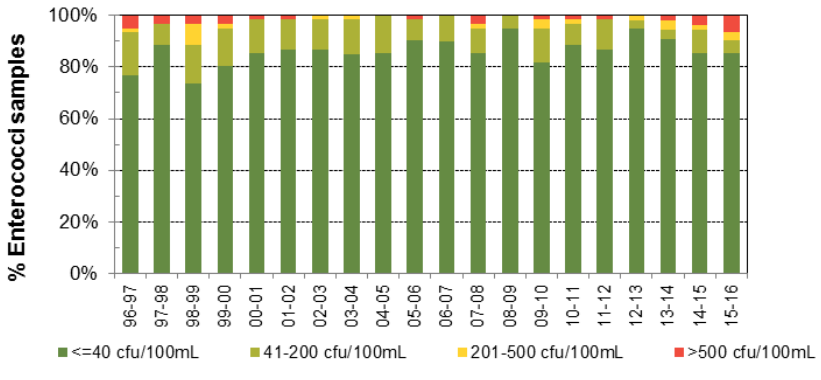


Response to rainfall

Rainfall from Waverly rain gauge



Trends in enterococci data through time



Bronte Beach

Beach Suitability Grade: G

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

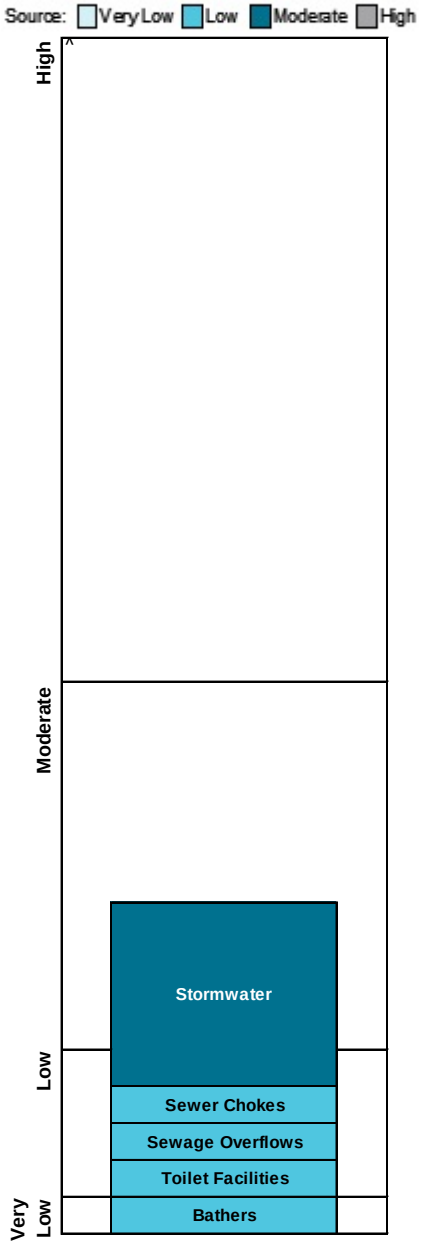
Bronte Beach is 250 metres long and backed by a large park and picnic area. Lifeguards patrol the beach between late September and mid-May.

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

The response to rainfall graph indicates that enterococci levels generally increased with increasing rainfall, often exceeding the safe swimming limit after 5mm of rainfall or more.

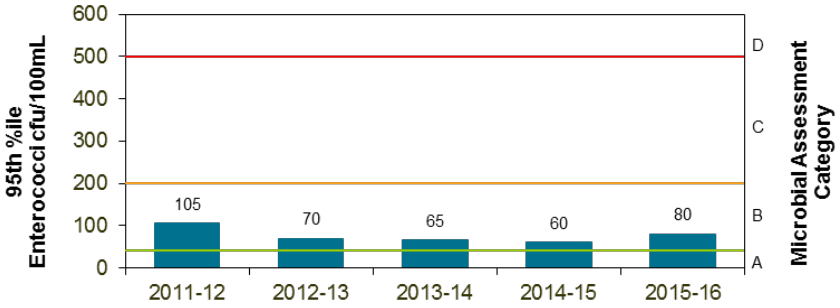
The site has been monitored since 1989.

Sanitary Inspection: **Moderate**



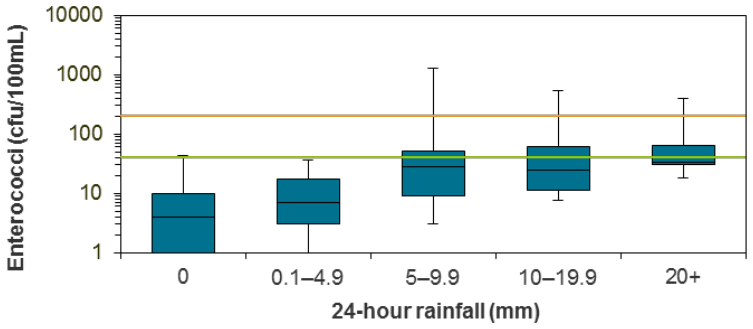
Microbial Assessment: **B**

Monitoring period for 2015–16 result is August 2014 to April 2016.

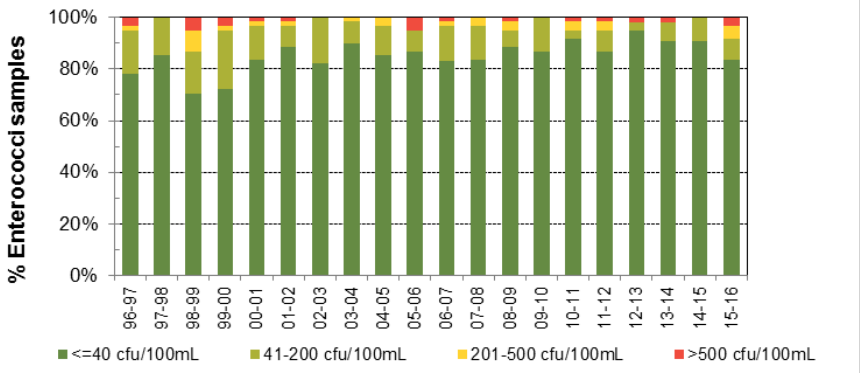


Response to rainfall

Rainfall from Waverly rain gauge



Trends in enterococci data through time



Clovelly Beach

Beach Suitability Grade: VG

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

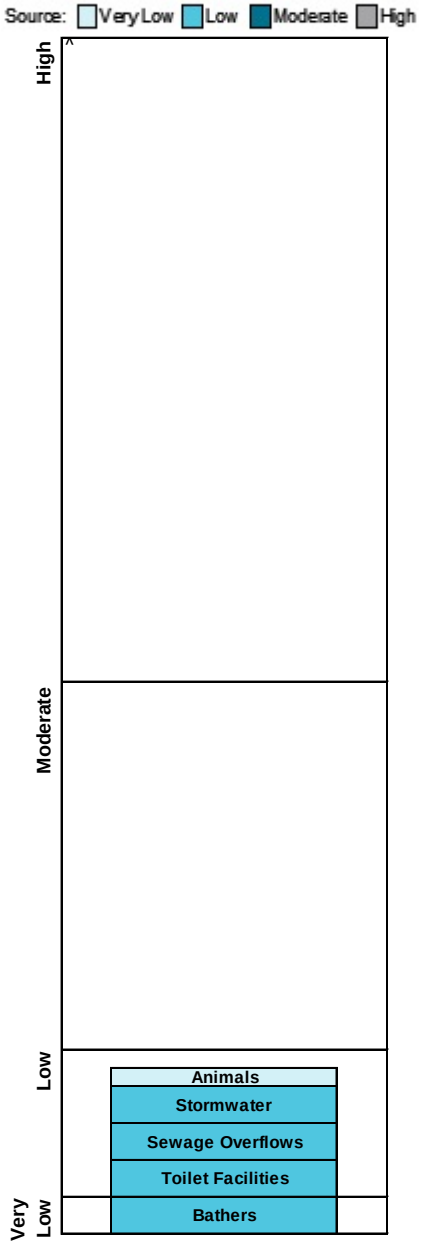
Clovelly Beach is at the end of a long and narrow bay and is protected from ocean swells. Wheelchair access to the water is provided. It is one of the safest beaches in Sydney and is patrolled from late September to April.

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

The response to rainfall graph indicates that enterococci levels increased slightly with increasing rainfall, often exceeding the safe swimming limit after 20mm of rainfall or more.

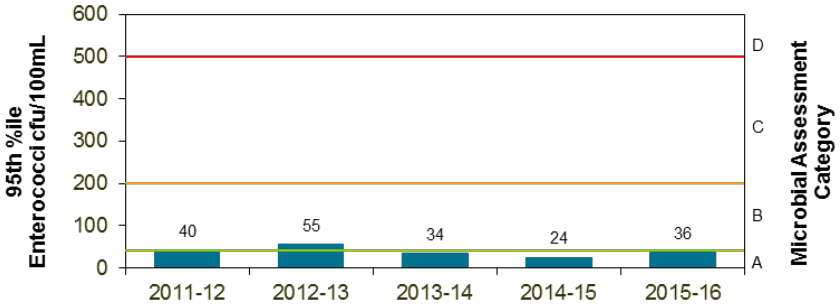
The site has been monitored since 1989.

Sanitary Inspection: **Low**



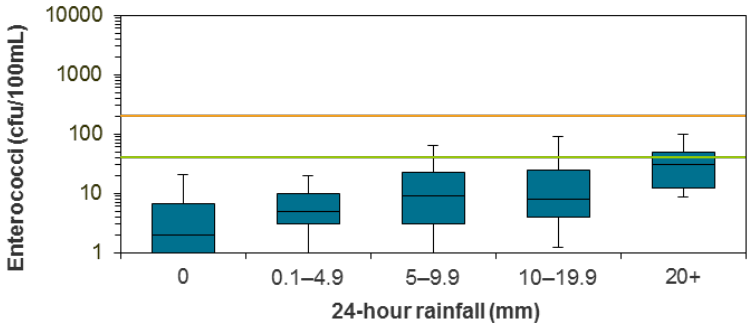
Microbial Assessment: **A**

Monitoring period for 2015–16 result is August 2014 to April 2016.

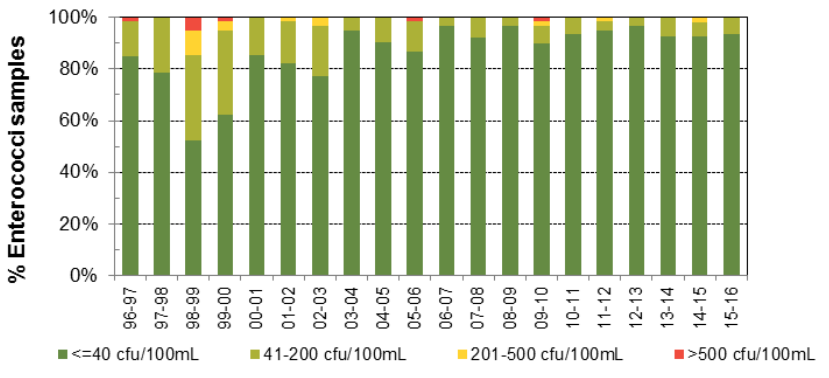


Response to rainfall

Rainfall from Waverly rain gauge



Trends in enterococci data through time



Gordons Bay

Beach Suitability Grade: G

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

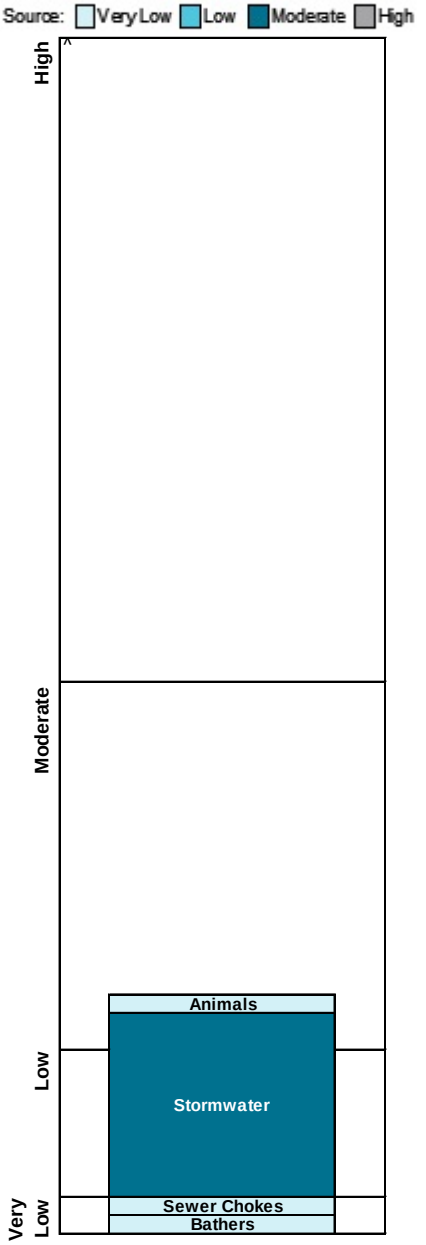
Gordons Bay is long and narrow with a small beach located at the end of the bay and sheer sandstone headlands. The bay is popular for snorkelling and diving but is not patrolled by lifeguards.

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

The response to rainfall graph indicates that enterococci levels increased slightly with increasing rainfall, often exceeding the safe swimming limit after 5mm of rainfall or more.

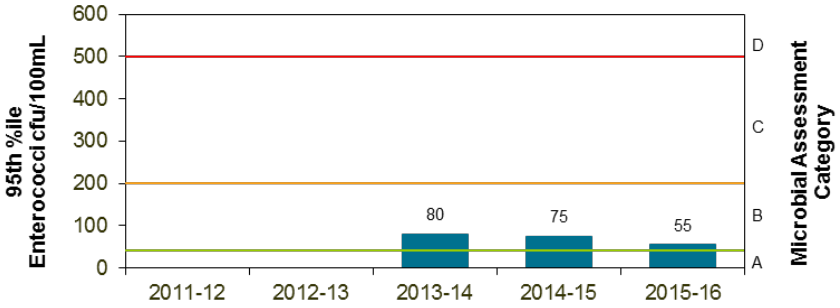
The site has been monitored since March 2013.

Sanitary Inspection: **Moderate**



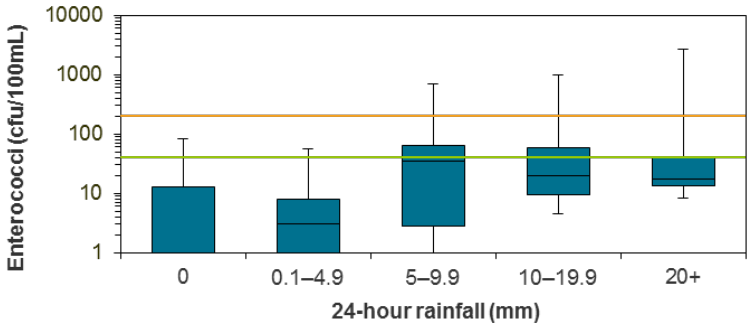
Microbial Assessment: **B**

Monitoring period for 2015–16 result is August 2014 to April 2016.

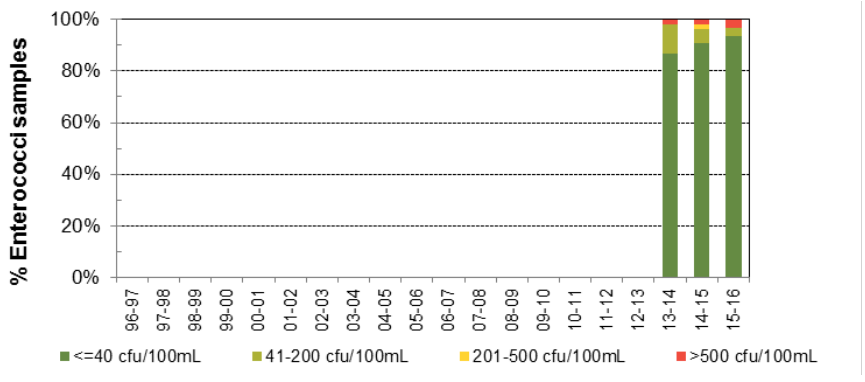


Response to rainfall

Rainfall from Malabar WWTP rain gauge



Trends in enterococci data through time



Coogee Beach

Beach Suitability Grade: **P**

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

Coogee Beach is 400 metres long and is backed by a promenade and parklands. The beach has a reputation for safe swimming and lifeguards patrol the beach all year round.

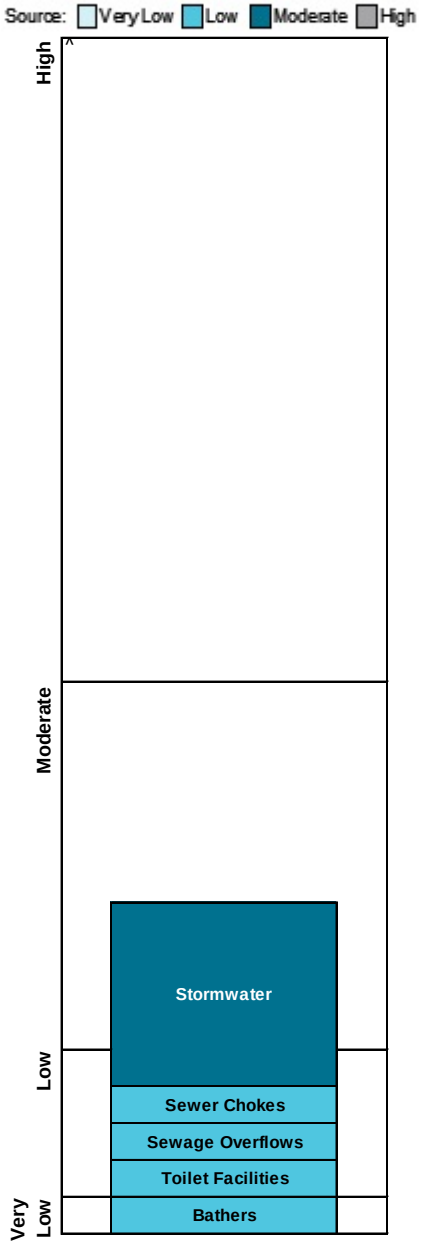
The Beach Suitability Grade of Poor indicates that microbial water quality is susceptible to faecal pollution, usually triggered by rainfall, with a number of potential sources of contamination including stormwater.

The response to rainfall graph indicates that enterococci levels increased with increasing rainfall, frequently exceeding the safe swimming limit after 5mm of rainfall or more.

The site has been monitored since 1989.

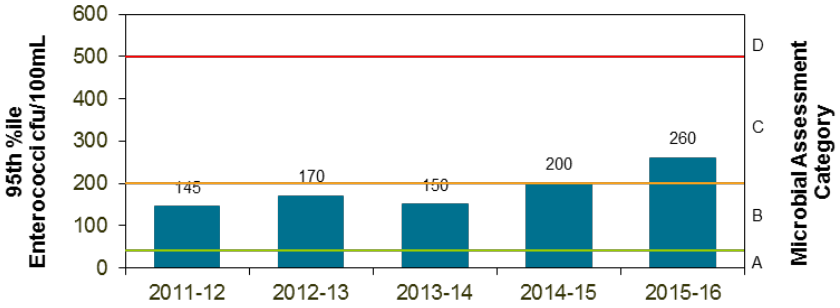
94% of dry weather samples were within the safe swimming limit

Sanitary Inspection: **Moderate**



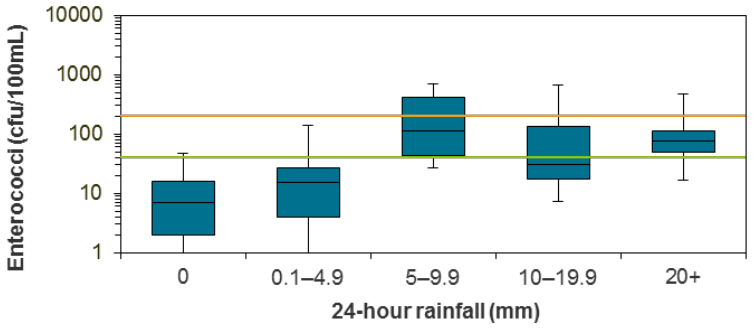
Microbial Assessment: **C**

Monitoring period for 2015–16 result is August 2014 to April 2016.

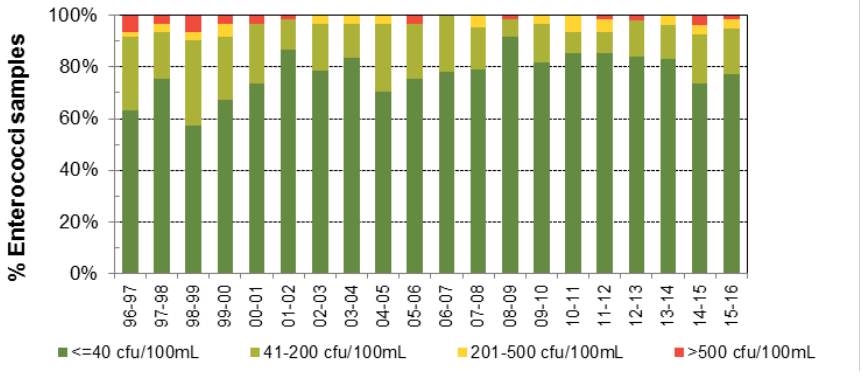


Response to rainfall

Rainfall from Malabar WWTP rain gauge



Trends in enterococci data through time



Maroubra Beach

Beach Suitability Grade: VG

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

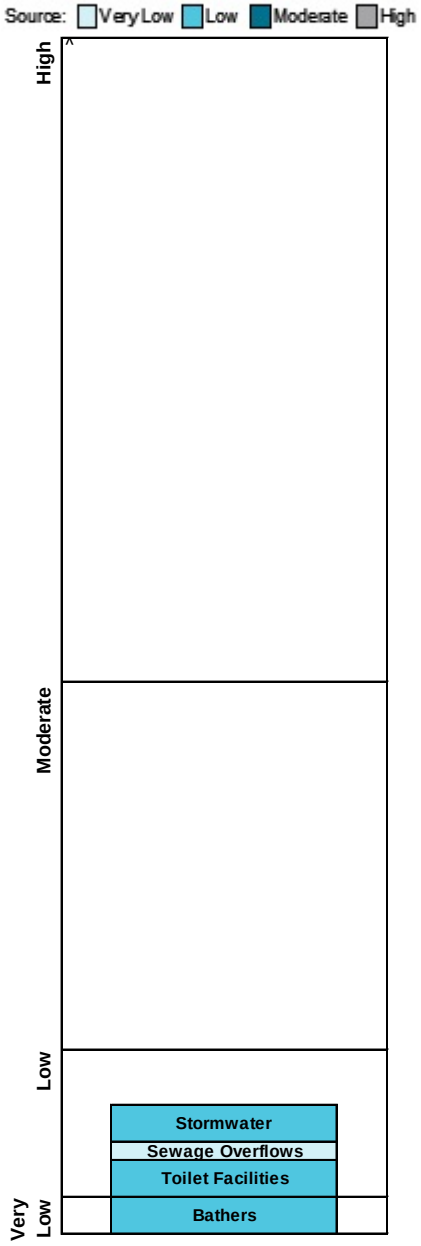
Maroubra Beach is one kilometre long. Strong rips create hazardous conditions at the beach, particularly in the centre and north. Lifeguards patrol the beach all year round.

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

The response to rainfall graph indicates that enterococci levels increased slightly with increasing rainfall, occasionally exceeding the safe swimming limit in response to 5mm or more of rainfall.

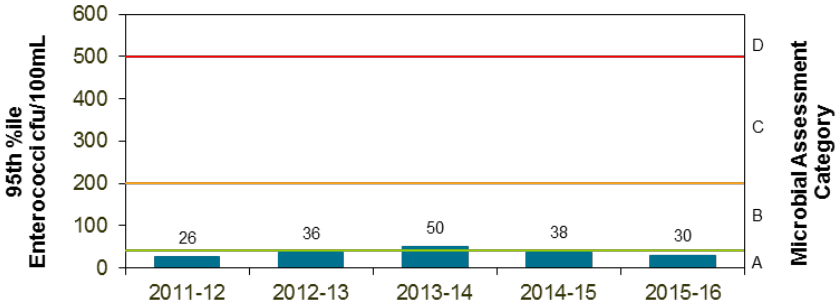
The site has been monitored since 1989.

Sanitary Inspection: **Low**



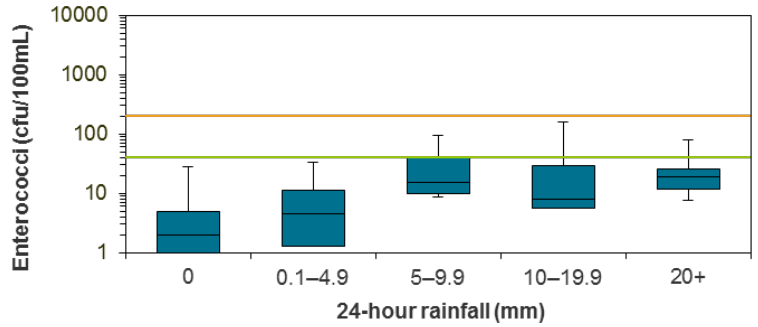
Microbial Assessment: **A**

Monitoring period for 2015–16 result is August 2014 to April 2016.

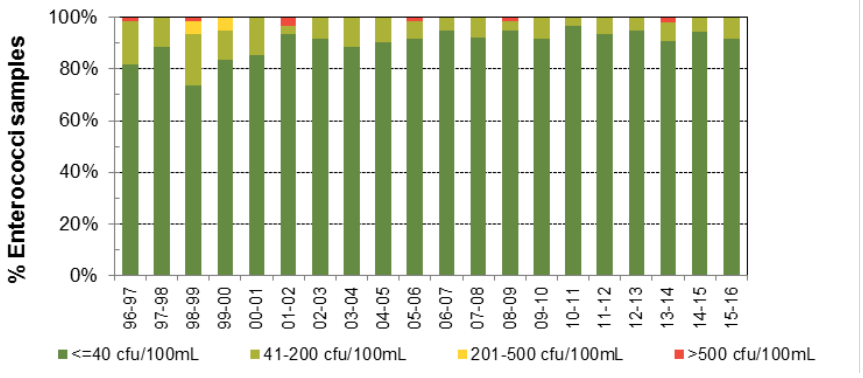


Response to rainfall

Rainfall from Malabar WWTP rain gauge

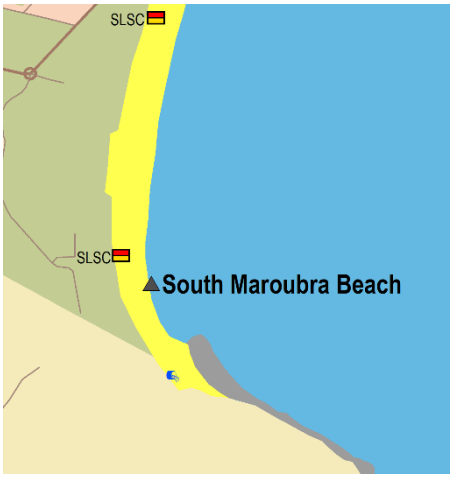


Trends in enterococci data through time



South Maroubra Beach

Beach Suitability Grade: G



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

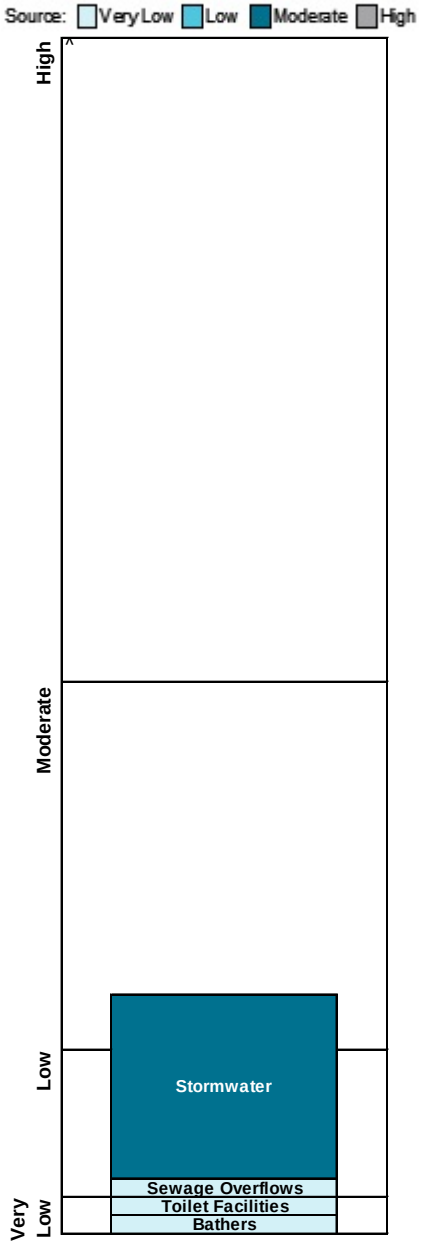
Maroubra Beach is one kilometre long. Strong rips create hazardous conditions at the beach, particularly in the centre and north. Lifeguards patrol the beach all year round.

The Beach Suitability Grade of Good indicates that microbial water quality is suitable for swimming most of the time, but the water may be susceptible to pollution following rainfall.

The response to rainfall graph indicates that enterococci levels increased slightly with increasing rainfall, occasionally exceeding the safe swimming limit in response to 5mm or more of rainfall.

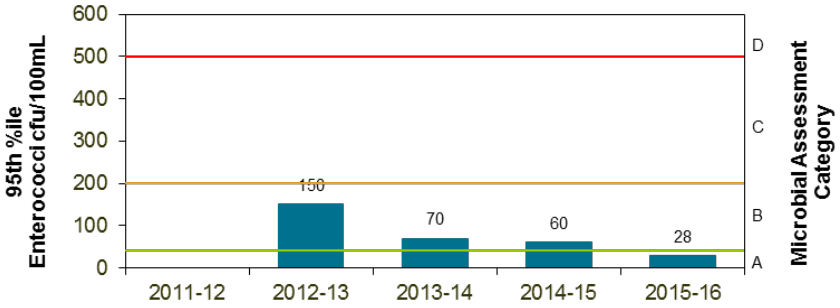
The site has been monitored since December 2012.

Sanitary Inspection: **Moderate**



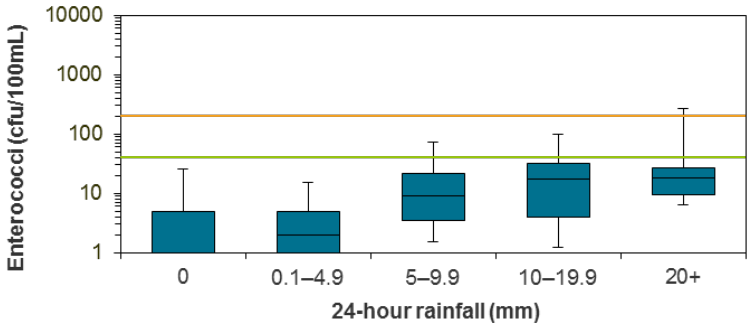
Microbial Assessment: **A**

Monitoring period for 2015–16 result is August 2014 to April 2016.

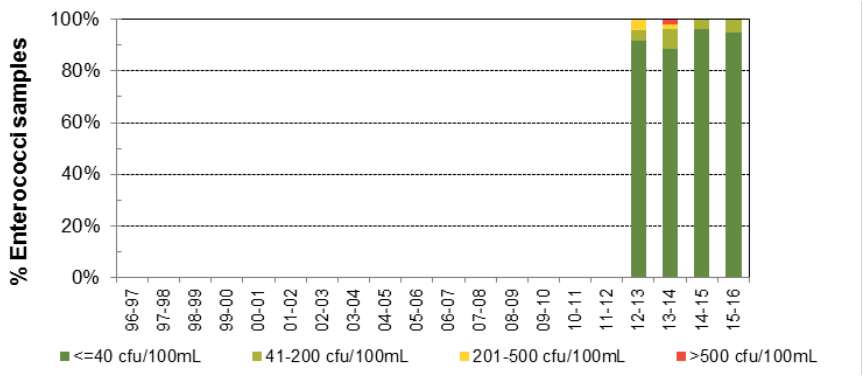


Response to rainfall

Rainfall from Malabar WWTP rain gauge

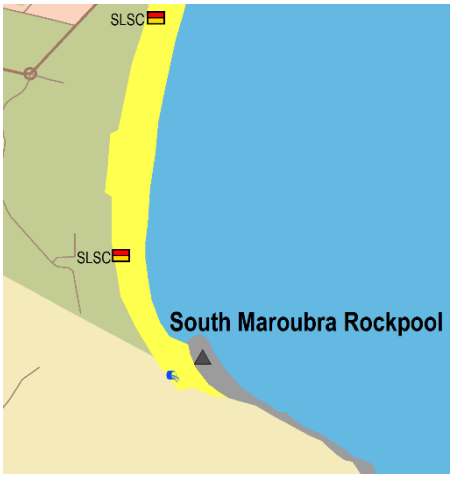


Trends in enterococci data through time



South Maroubra Rockpool

Beach Suitability Grade: G



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

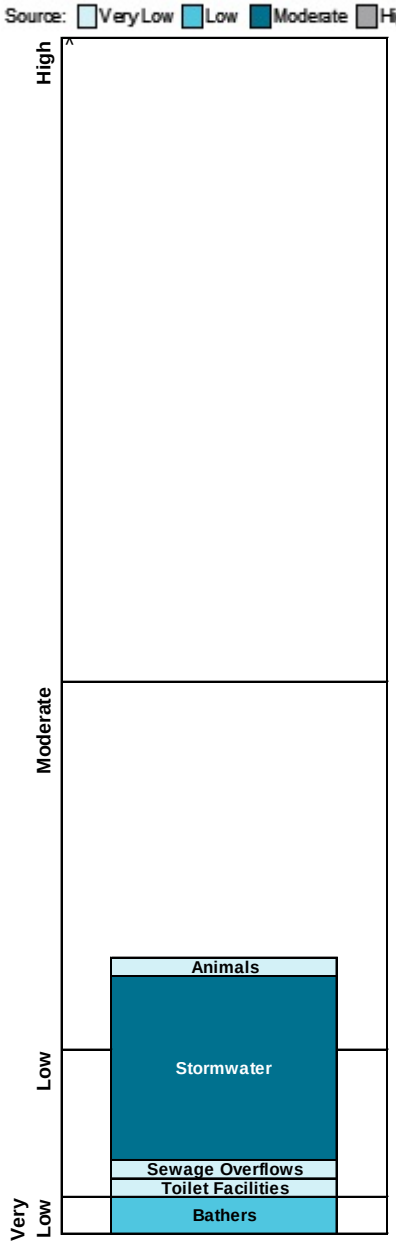
South Maroubra Rockpool is located at the southern end of Maroubra Beach. During very low tides, the rockpool may be empty. The rockpool is not patrolled.

The Beach Suitability Grade of Good indicates that microbial water quality is suitable for swimming most of the time, but the water may be susceptible to pollution following rainfall.

The response to rainfall graph indicates that enterococci levels increased with increasing rainfall, regularly exceeding the safe swimming limit in response to 5mm or more of rainfall.

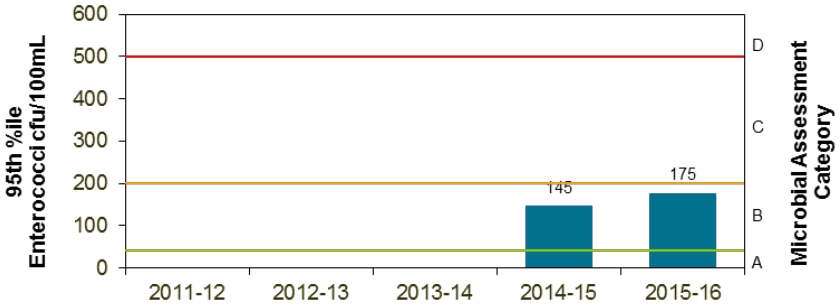
The site has been monitored since December 2012.

Sanitary Inspection: **Moderate**



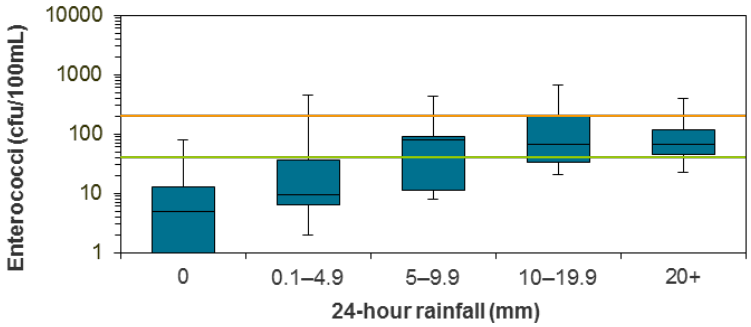
Microbial Assessment: **B**

Monitoring period for 2015–16 result is August 2014 to April 2016.

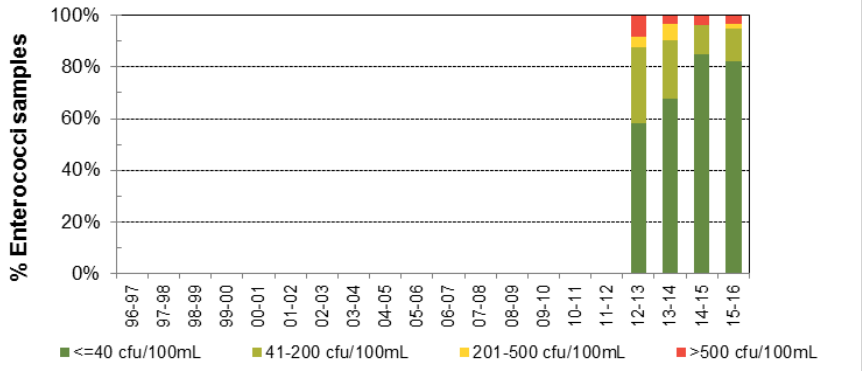


Response to rainfall

Rainfall from Malabar WWTP rain gauge

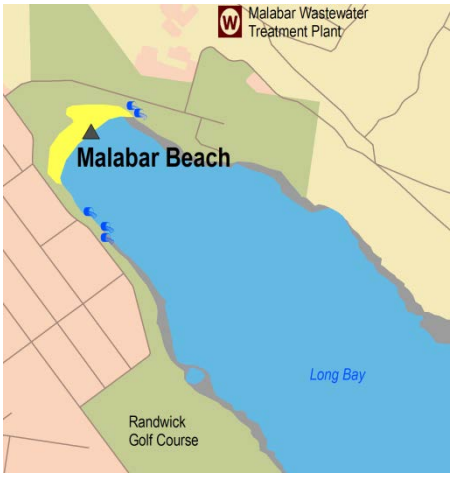


Trends in enterococci data through time



Malabar Beach

Beach Suitability Grade: **P**



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

Malabar Beach is 150 metres long and situated at the end of a long, narrow bay. It is backed by a small park and picnic area. The beach is not patrolled.

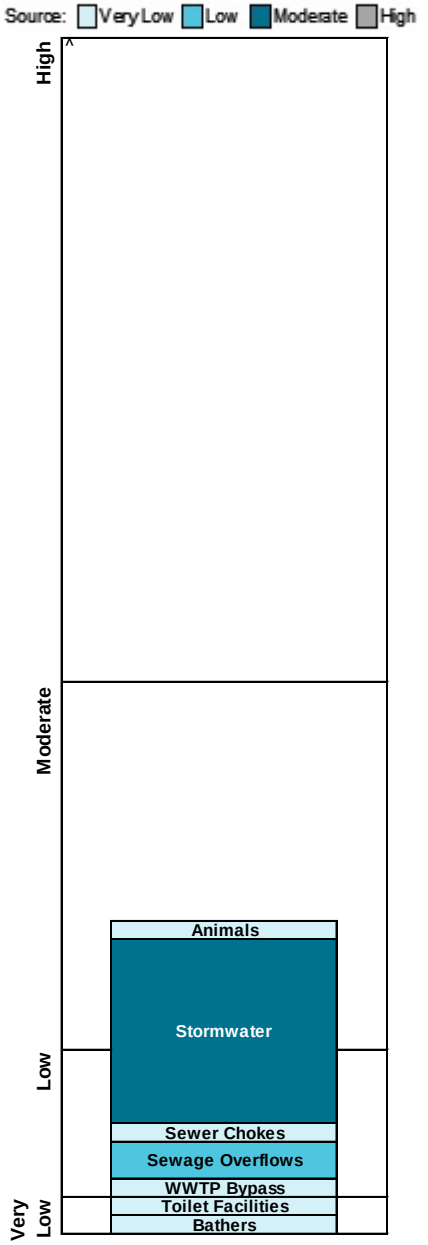
The Beach Suitability Grade of Poor indicates that microbial water quality is susceptible to faecal pollution with a number of potential sources of contamination including stormwater.

The response to rainfall graph indicates that enterococci levels increased with increasing rainfall, sometimes exceeding the safe swimming limit after little or no rain, and regularly after 5mm of rainfall or more.

76% of dry weather samples were within the safe swimming limit

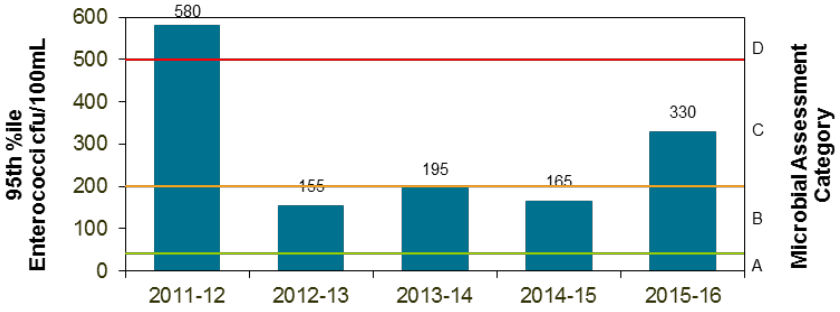
The site has been monitored since 1989, with significant improvements in water quality since 2012–2013 due to the diversion of the large stormwater drain at the northern end of the beach.

Sanitary Inspection: **Moderate**



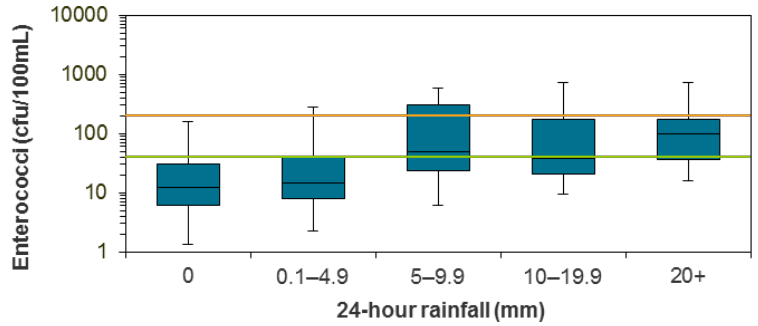
Microbial Assessment: **C**

Monitoring period for 2015–16 result is August 2014 to April 2016.

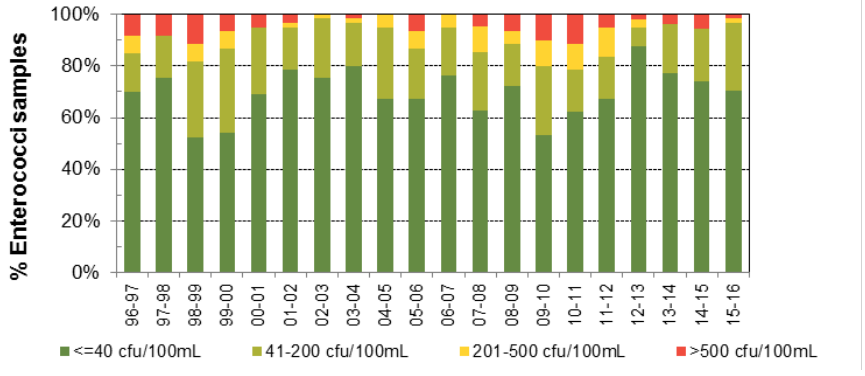


Response to rainfall

Rainfall from Malabar WWTP rain gauge



Trends in enterococci data through time



Little Bay Beach

Beach Suitability Grade: G

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

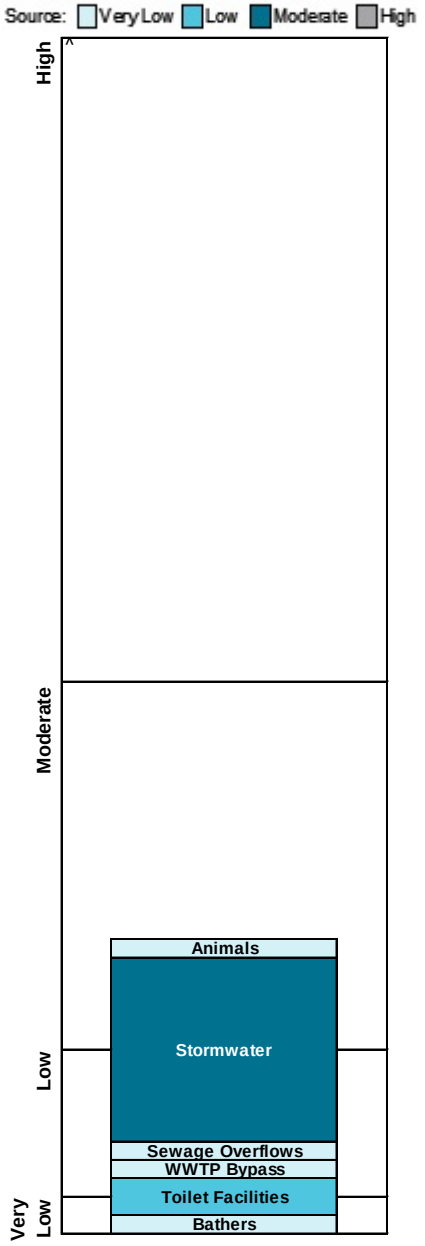
Little Bay Beach is a small, crescent-shaped beach bounded by rocky headlands to the north and south. Beach conditions are generally calm and the beach is not patrolled. The bay is backed by a golf course and a new residential development.

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

The response to rainfall graph indicates that enterococci levels increased with increasing rainfall, often exceeding the safe swimming limit after 5mm of rainfall or more.

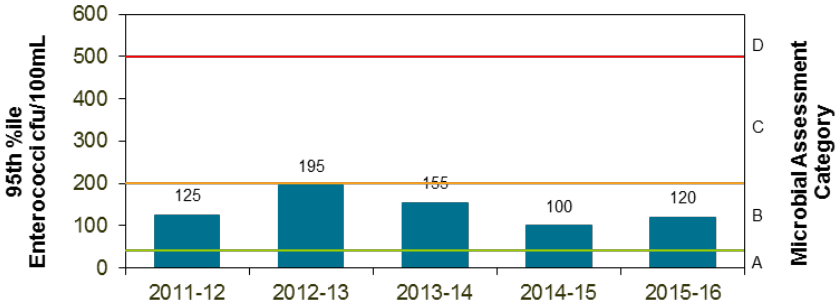
The site was monitored between 1989 and 1995. Sampling recommenced in 2006 in response to the increased popularity of the beach as a result of surrounding urban development.

Sanitary Inspection: **Moderate**



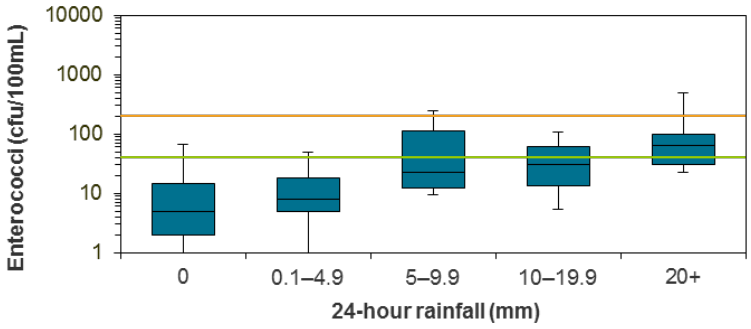
Microbial Assessment: **B**

Monitoring period for 2015–16 result is August 2014 to April 2016.

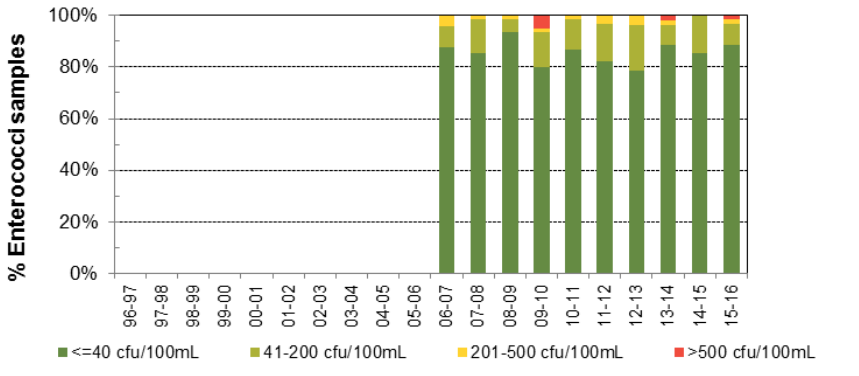


Response to rainfall

Rainfall from Malabar WWTP rain gauge



Trends in enterococci data through time



Watsons Bay

Beach Suitability Grade: G

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

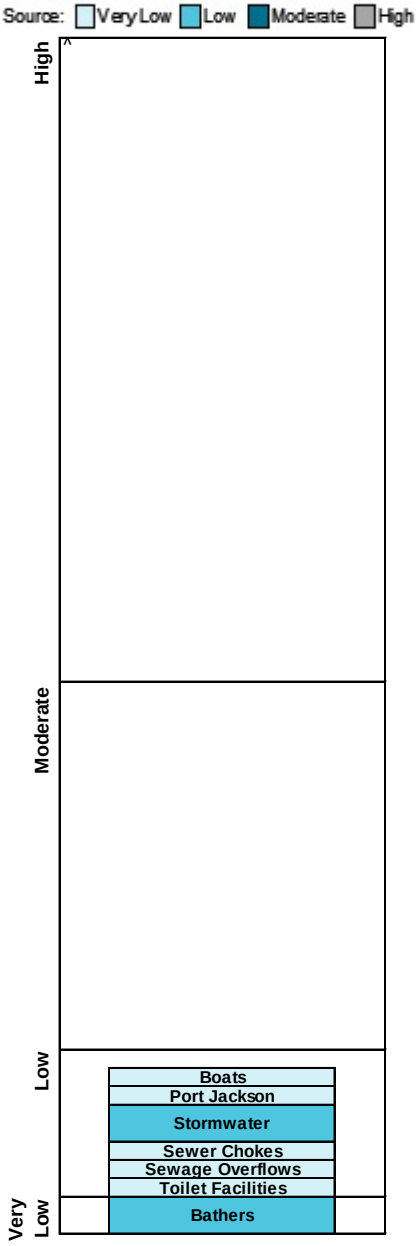
The swimming site is a 20 by 40 metre enclosed tidal swimming area next to the Vaucluse Yacht Club. The baths are backed by a narrow sandy beach and parklands with picnic facilities.

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

The response to rainfall graph indicates that enterococci levels increased with increasing rainfall, regularly exceeding the safe swimming limit in response to 20mm of rainfall or more.

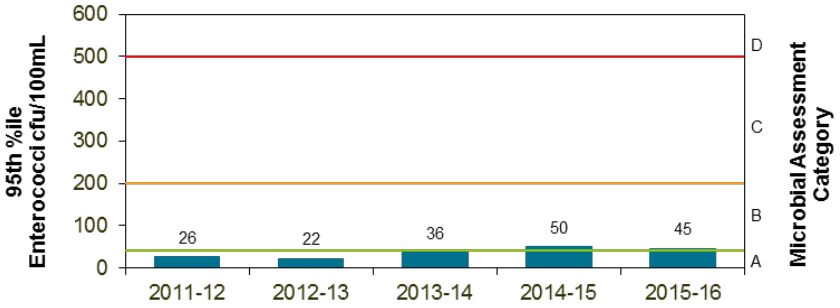
The site has been monitored since 1994. Microbial water quality has generally improved since 2000–2001 owing to licensing of discharges from the sewerage system and improved management of stormwater.

Sanitary Inspection: **Low**



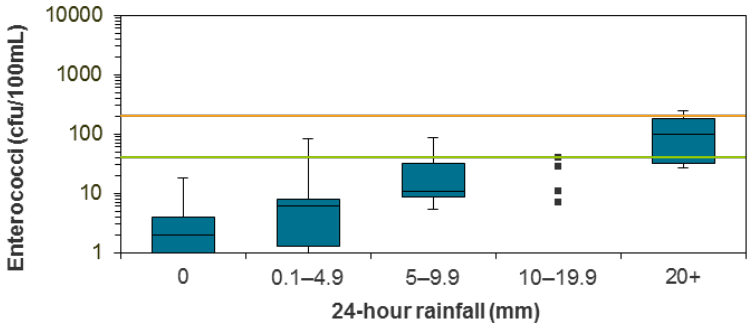
Microbial Assessment: **B**

Monitoring period for 2015–16 result is December 2013 to April 2016.

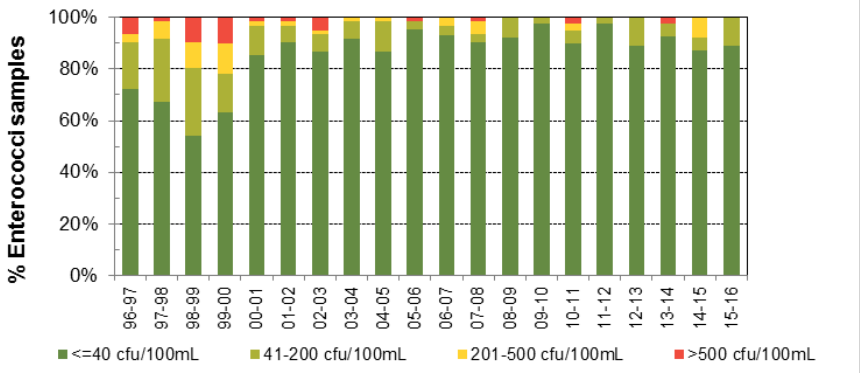


Response to rainfall

Rainfall from Mosman rain gauge

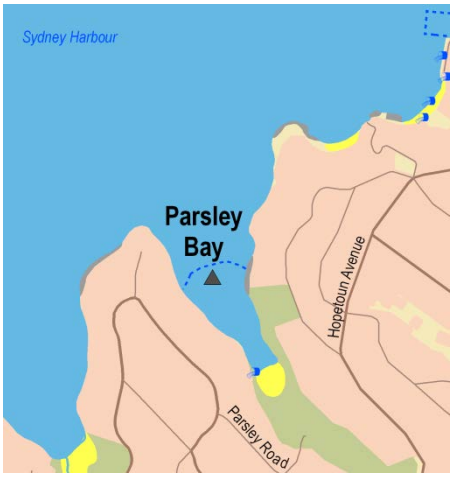


Trends in enterococci data through time



Parsley Bay

Beach Suitability Grade: G



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

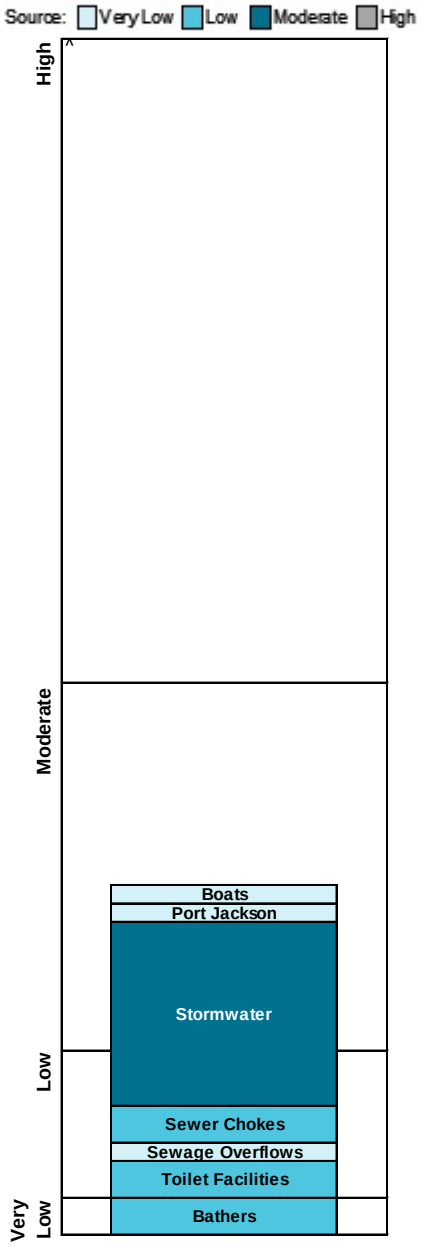
The southern end of Parsley Bay is netted from September to May to provide a large and safe swimming area. The sandy beach is backed by Parsley Bay Reserve, which contains picnic facilities and a playground.

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

The response to rainfall graph indicates that enterococci levels increased with increasing rainfall, frequently exceeding the safe swimming limit in response to 20mm of rainfall or more.

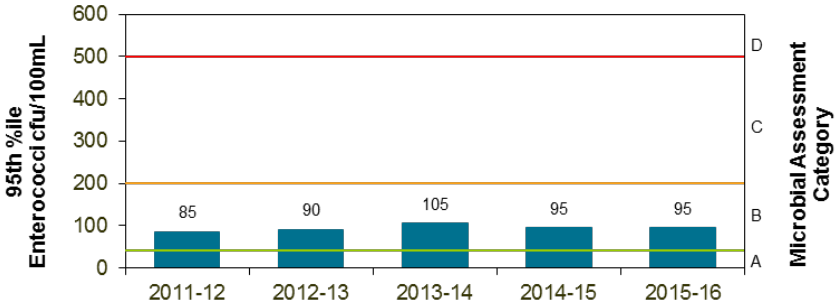
The site has been monitored since 1994. Microbial water quality has generally improved since 2000–2001 owing to licensing of discharges from the sewerage system and improved management of stormwater.

Sanitary Inspection: **Moderate**



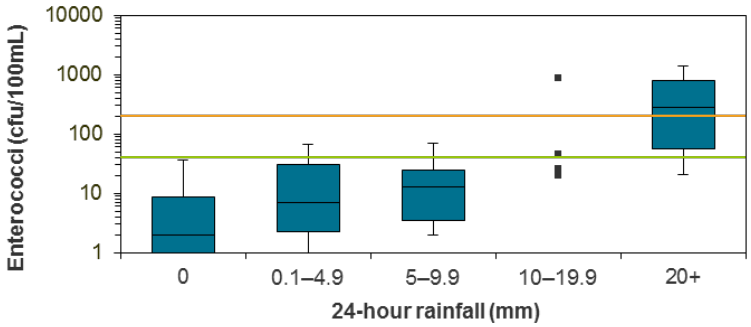
Microbial Assessment: **B**

Monitoring period for 2015–16 result is December 2013 to April 2016.

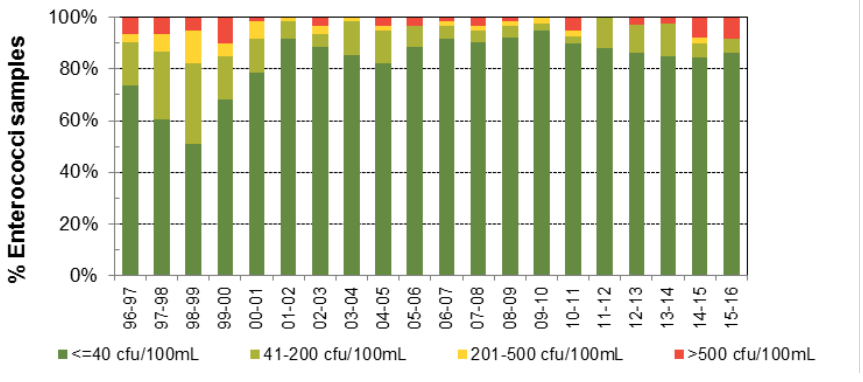


Response to rainfall

Rainfall from Mosman rain gauge



Trends in enterococci data through time



Nielsen Park

Beach Suitability Grade: VG

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

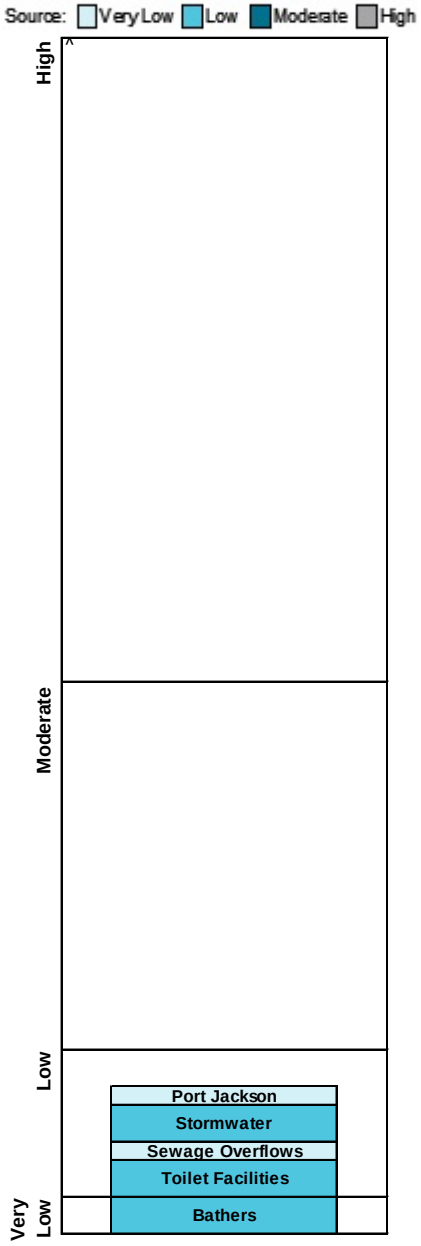
The Nielsen Park swimming area is approximately 150 metres long and enclosed by a shark net between October and April. The sandy beach and surrounding parklands are part of Sydney Harbour National Park. There are toilet and shower facilities, a café and a restaurant.

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

The response to rainfall graph indicates that enterococci levels increased slightly with increasing rainfall, often exceeding the safe swimming limit in response to 20mm of rainfall or more.

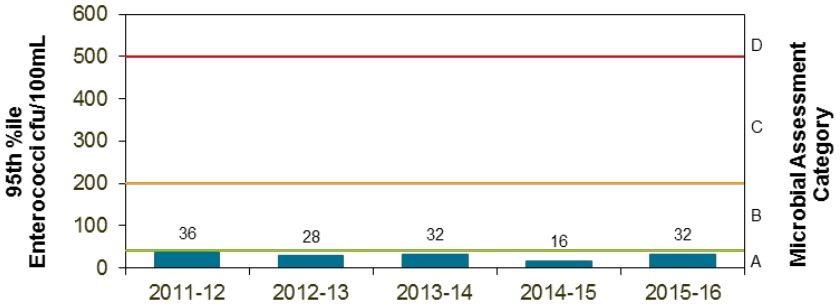
The site has been monitored since 1994. Microbial water quality has generally improved since 2000–2001 owing to licensing of discharges from the sewerage system and improved management of stormwater.

Sanitary Inspection: **Low**



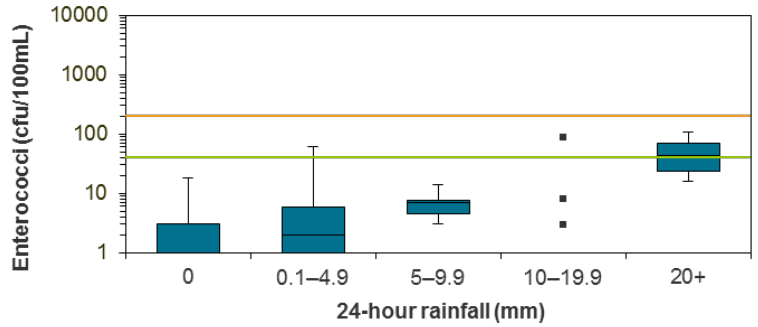
Microbial Assessment: **A**

Monitoring period for 2015–16 result is December 2013 to April 2016.

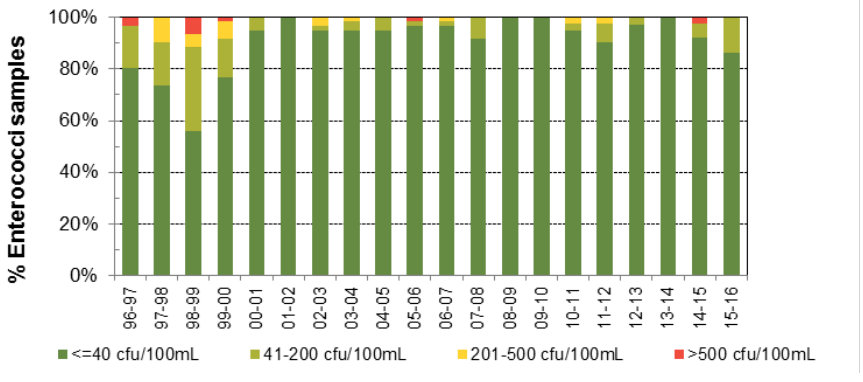


Response to rainfall

Rainfall from Mosman rain gauge



Trends in enterococci data through time



Rose Bay Beach

Beach Suitability Grade: G

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

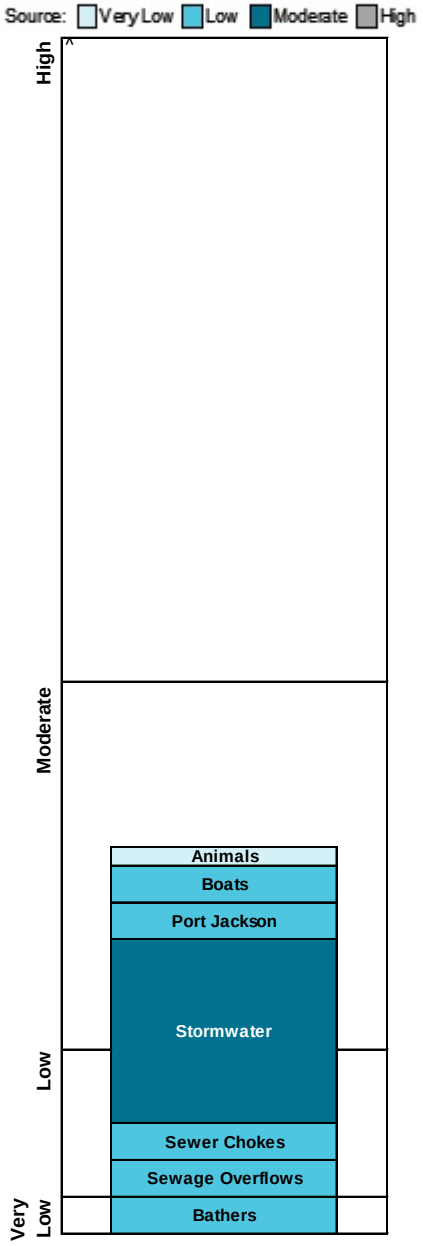
Rose Bay Beach is approximately 500 metres long and the swimming area is not netted. The bay is popular for recreational boating, and a sailing school and sailboat hire company operate in the area. A park with picnic and playground facilities is located adjacent to the beach.

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

The response to rainfall graph indicates that enterococci levels increased with increasing rainfall, often exceeding the safe swimming limit in response to 10mm of rainfall or more.

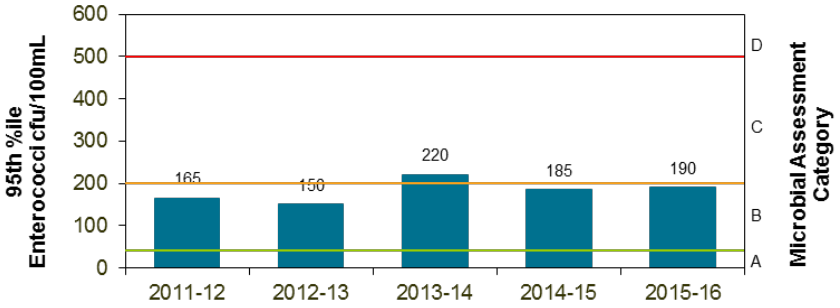
The site has been monitored since 1994. Microbial water quality has generally improved since 2000–2001 owing to licensing of discharges from the sewerage system and improved management of stormwater.

Sanitary Inspection: **Moderate**



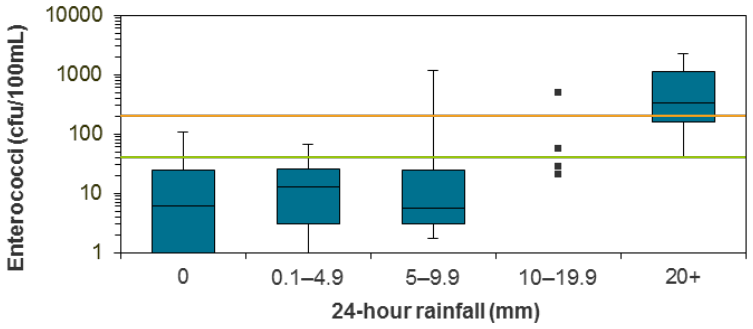
Microbial Assessment: **B**

Monitoring period for 2015–16 result is December 2013 to April 2016.

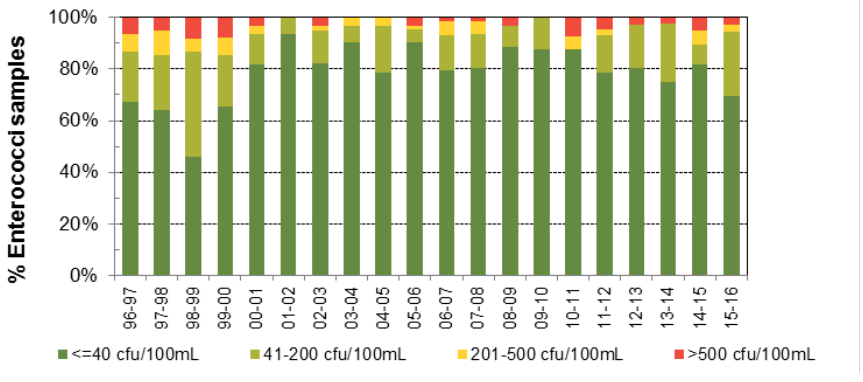


Response to rainfall

Rainfall from Mosman rain gauge



Trends in enterococci data through time



Murray Rose Pool

Beach Suitability Grade: G

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

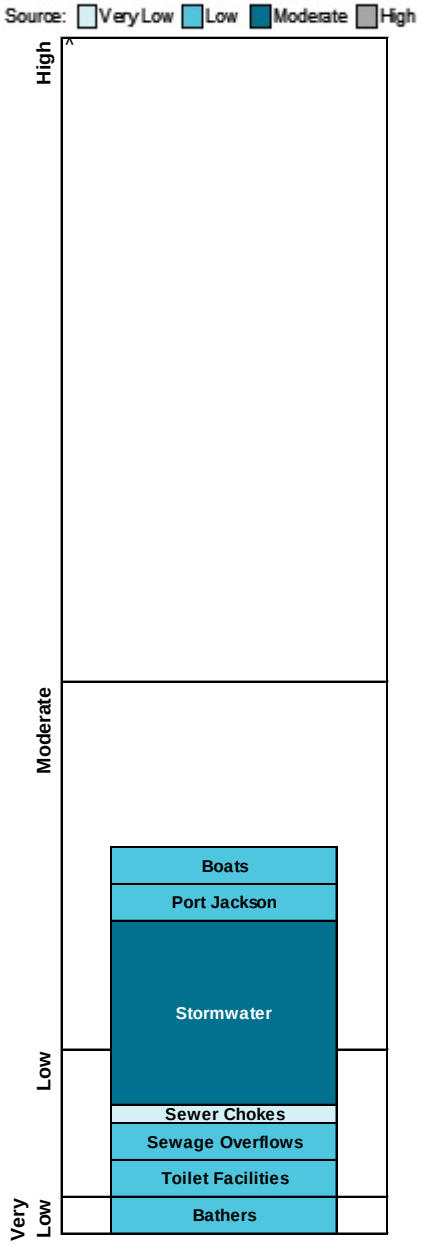
Murray Rose Pool (formerly Redleaf Pool) is a netted swimming enclosure located in Double Bay, at the end of Seven Shillings Beach. The pool is bordered on three sides by a narrow sun deck and is backed by a park and Woollahra Council office.

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

The response to rainfall graph indicates that enterococci levels increased with increasing rainfall, often exceeding the safe swimming limit in response to 20mm of rainfall or more.

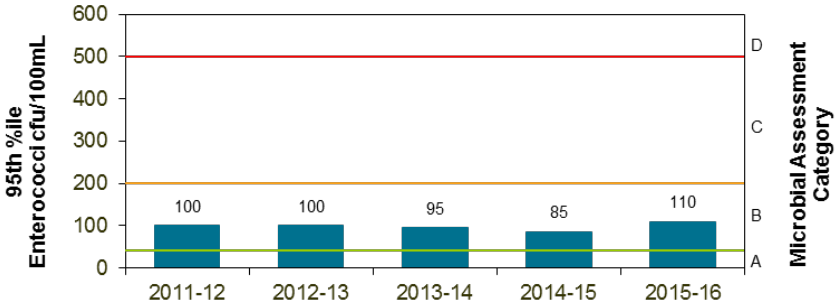
The site has been monitored since 1994. Microbial water quality has generally improved since 2000–2001 owing to licensing of discharges from the sewerage system and improved management of stormwater.

Sanitary Inspection: **Moderate**



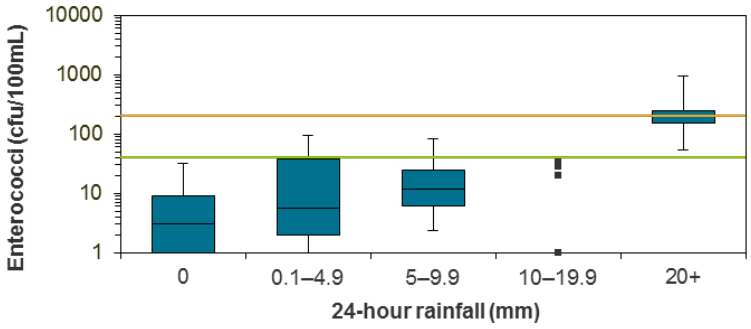
Microbial Assessment: **B**

Monitoring period for 2015–16 result is December 2013 to April 2016.

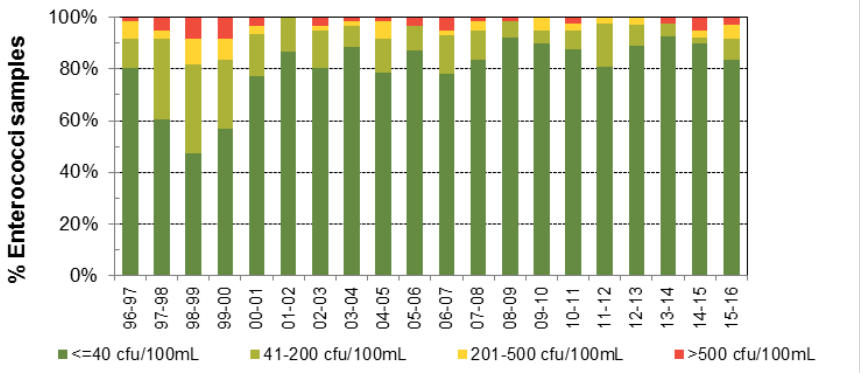


Response to rainfall

Rainfall from Mosman rain gauge



Trends in enterococci data through time



Dawn Fraser Pool

Beach Suitability Grade: G

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

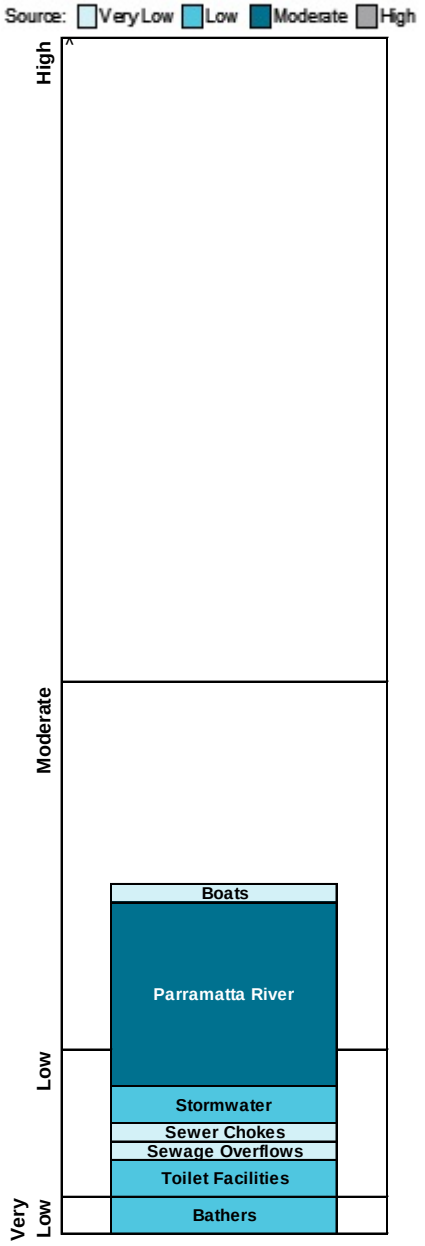
Dawn Fraser Pool in Balmain is the oldest pool and swimming club in Australia and is listed on the NSW State Heritage Register. Boardwalks and a pavilion surround the enclosed tidal swimming area. The pool is open between October and April each year.

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

The response to rainfall graph indicates that enterococci levels increased with increasing rainfall, occasionally exceeding the safe swimming limit in response to light rainfall and regularly after 10mm or more.

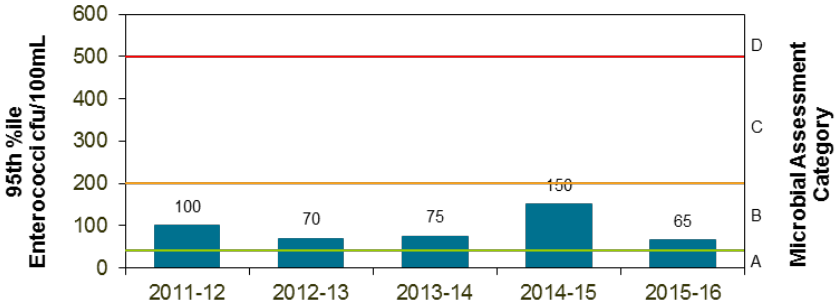
The site has been monitored since 1994. Microbial water quality has generally improved since 2000–2001 owing to licensing of discharges from the sewerage system and improved management of stormwater.

Sanitary Inspection: **Moderate**



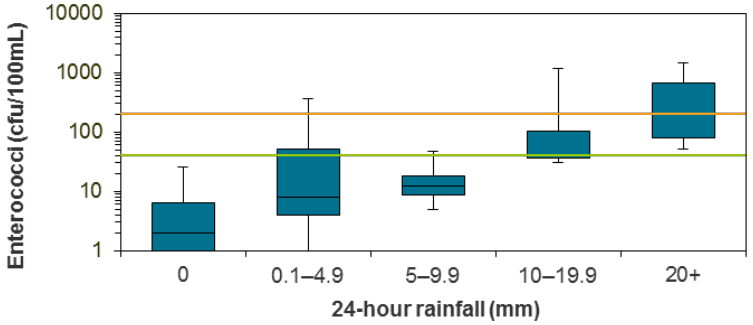
Microbial Assessment: **B**

Monitoring period for 2015–16 result is December 2013 to April 2016.

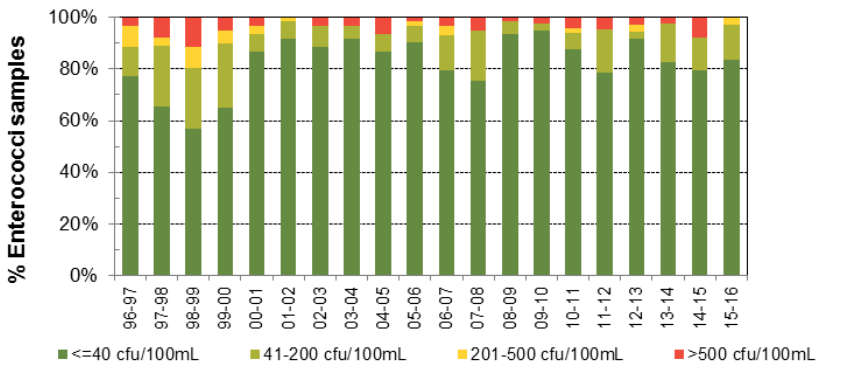


Response to rainfall

Rainfall from Lilyfield rain gauge

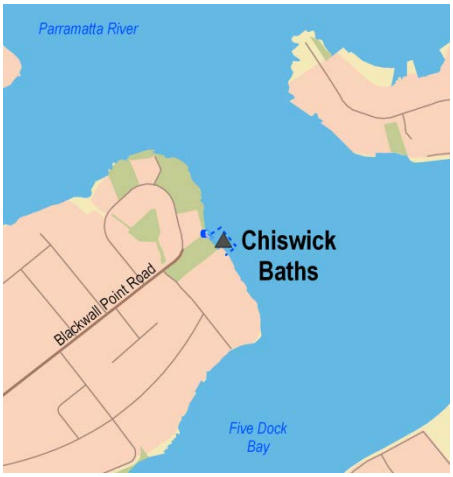


Trends in enterococci data through time



Chiswick Baths

Beach Suitability Grade: G



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

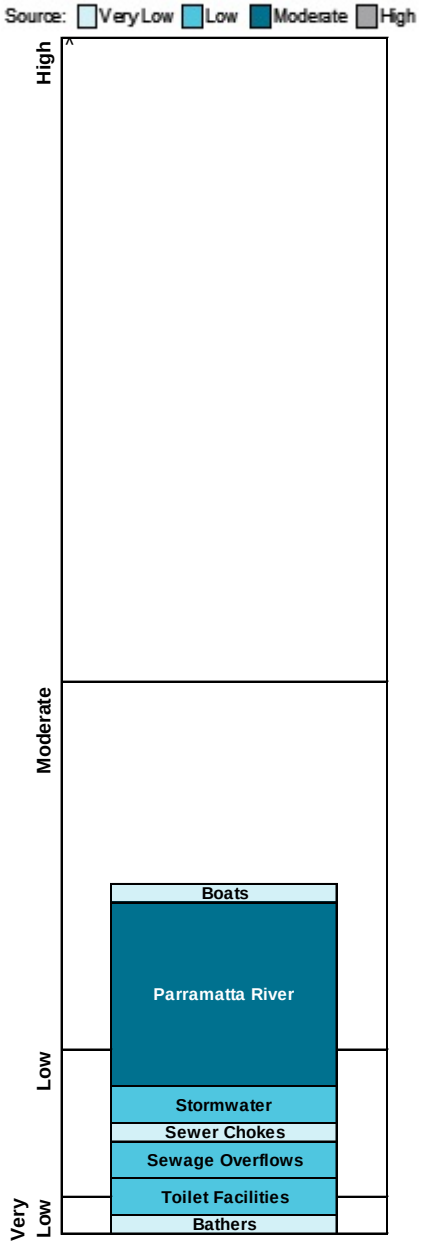
Chiswick Baths are a netted swimming enclosure in Five Dock Bay. The swimming site is backed by a narrow sandy beach and a park with picnic and barbecue facilities.

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

The response to rainfall graph indicates that enterococci levels increased with increasing rainfall, frequently exceeding the safe swimming limit in response to 10mm of rainfall or more.

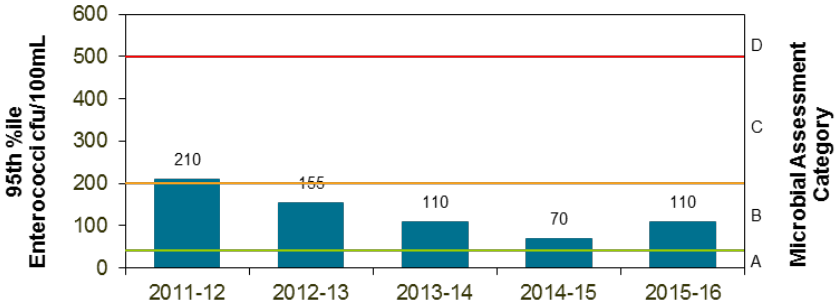
The site has been monitored since 1998. Microbial water quality has generally improved since 2000–2001 owing to licensing of discharges from the sewerage system and improved management of stormwater.

Sanitary Inspection: **Moderate**



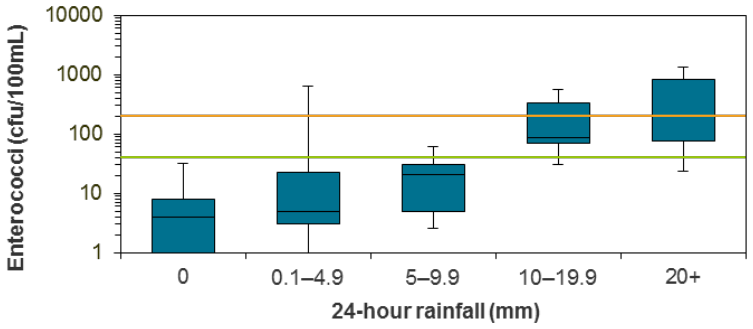
Microbial Assessment: **B**

Monitoring period for 2015–16 result is December 2013 to April 2016.

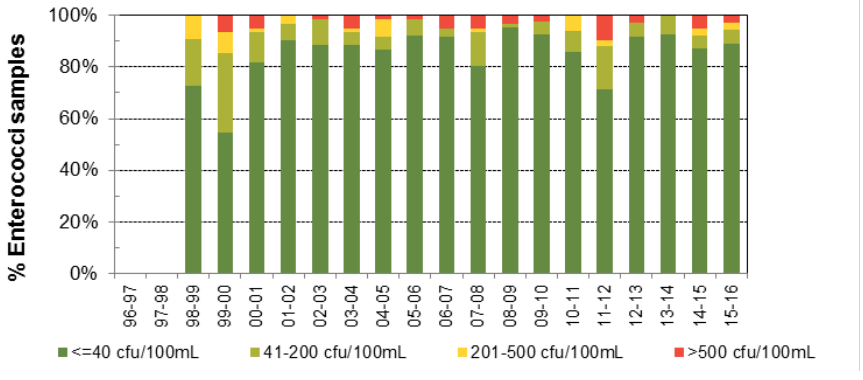


Response to rainfall

Rainfall from Gladesville rain gauge



Trends in enterococci data through time



Cabarita Beach

Beach Suitability Grade: G

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

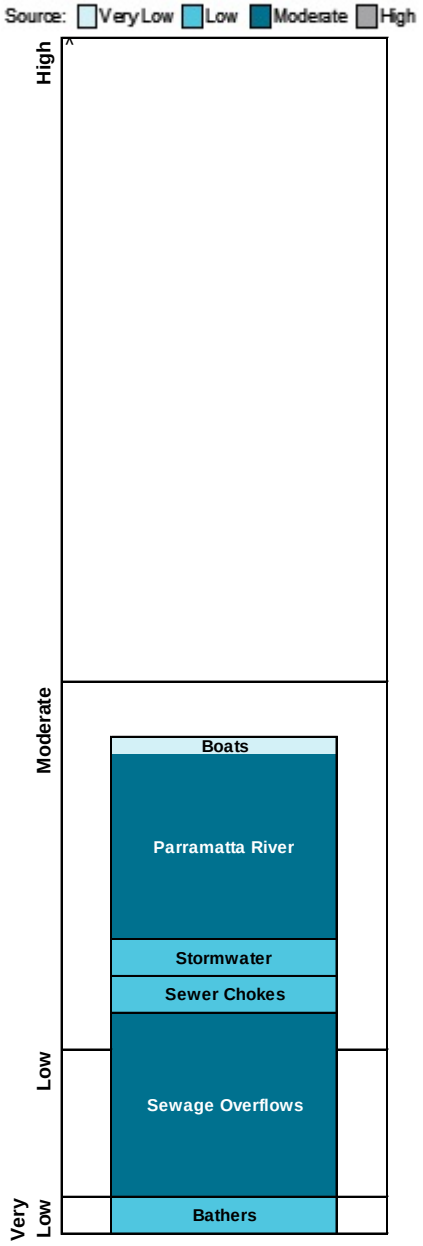
Cabarita Beach is located at the end of Cabarita Point. The beach is 120 metres long and is backed by parklands with picnic and barbecue facilities and a playground.

The Beach Suitability Grade of Good indicates that the water quality is safe for swimming most of the time but can be susceptible to pollution after heavy rain, with potential faecal contamination from sewage overflows and discharge from the Parramatta River.

The response to rainfall graph indicates that enterococci levels increased with increasing rainfall, regularly exceeding the safe swimming limit in response to 10mm of rainfall or more.

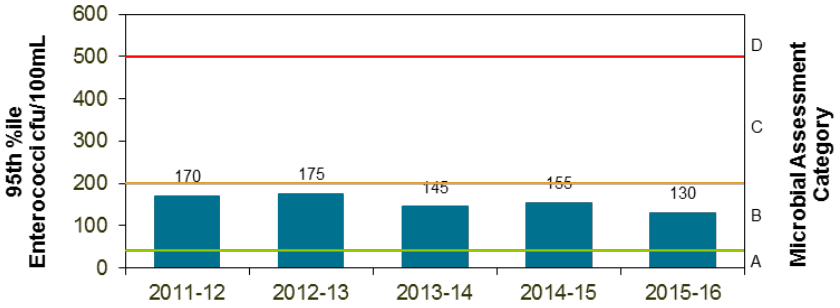
The site has been monitored since 1996. Microbial water quality has generally improved since 2000–2001 owing to licensing of discharges from the sewerage system and improved management of stormwater.

Sanitary Inspection: **Moderate**



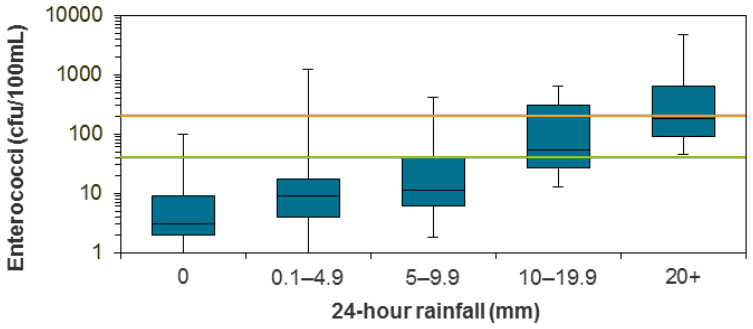
Microbial Assessment: **B**

Monitoring period for 2015–16 result is December 2013 to April 2016.

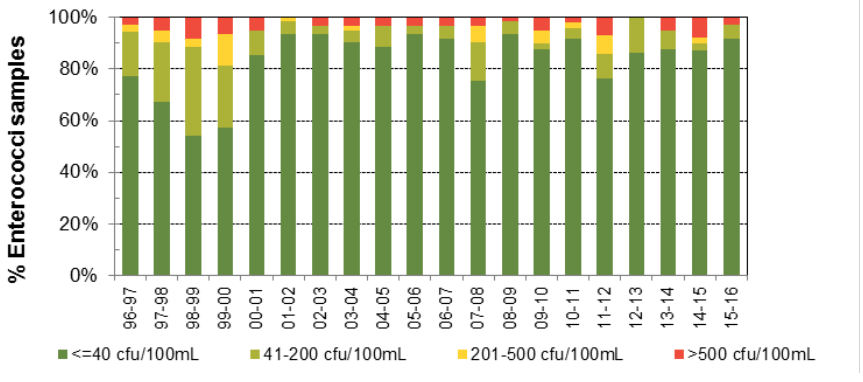


Response to rainfall

Rainfall from Gladesville rain gauge



Trends in enterococci data through time



Woolwich Baths

Beach Suitability Grade: G

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

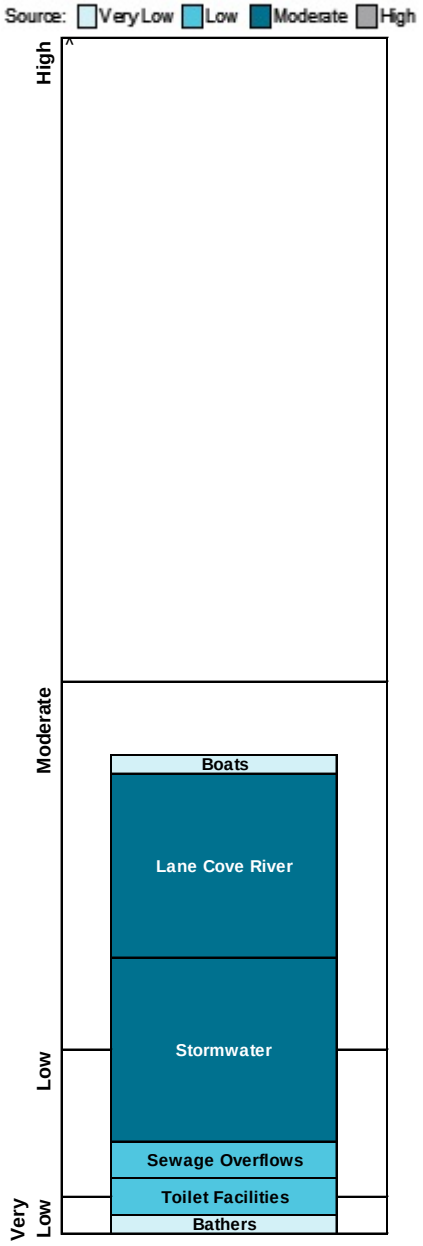
Woolwich Baths are a 20 by 30 metre netted swimming area in the lower Lane Cove River. The baths are backed by a narrow sandy beach and are adjacent to a reserve.

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

The response to rainfall graph indicates that enterococci levels increased with increasing rainfall, regularly exceeding the safe swimming limit in response to 10mm of rainfall or more.

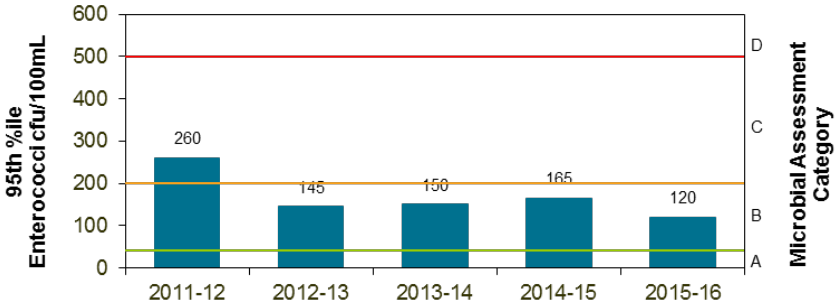
The site has been monitored since 1994. Microbial water quality has generally improved since 2000–2001 owing to licensing of discharges from the sewerage system and improved management of stormwater.

Sanitary Inspection: **Moderate**



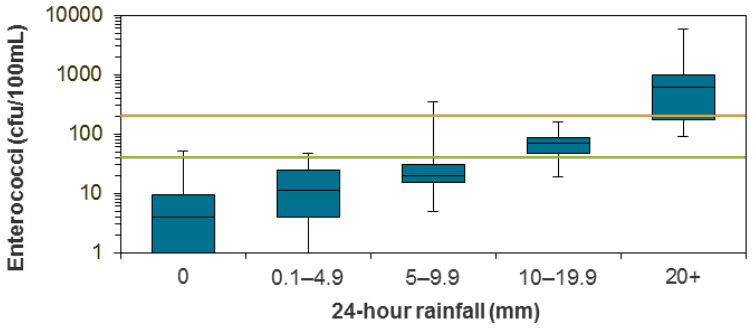
Microbial Assessment: **B**

Monitoring period for 2015–16 result is December 2013 to April 2016.

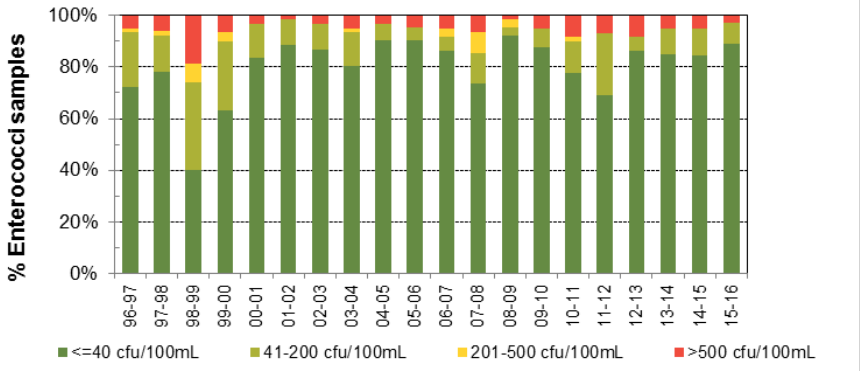


Response to rainfall

Rainfall from Gladesville rain gauge



Trends in enterococci data through time



Tambourine Bay

Beach Suitability Grade: G

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

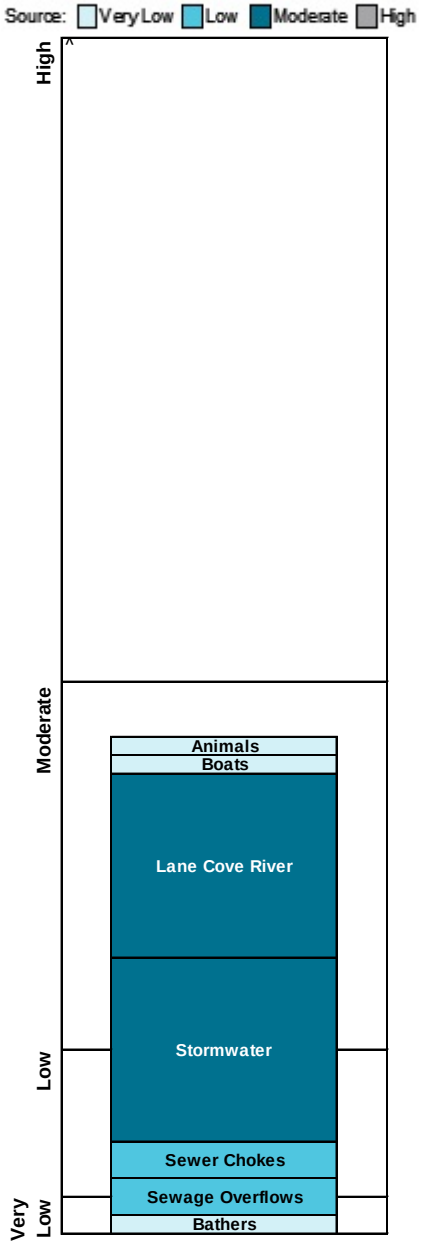
Tambourine Bay is located in the lower Lane Cove River. It is backed by parklands with picnic and barbecue facilities and a playground. Lane Cove Council has removed the swimming enclosure and access to the water is limited.

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

The response to rainfall graph indicates that enterococci levels increased with increasing rainfall, occasionally exceeding the safe swimming limit in response to little or no rain, and regularly after 5mm of rainfall or more.

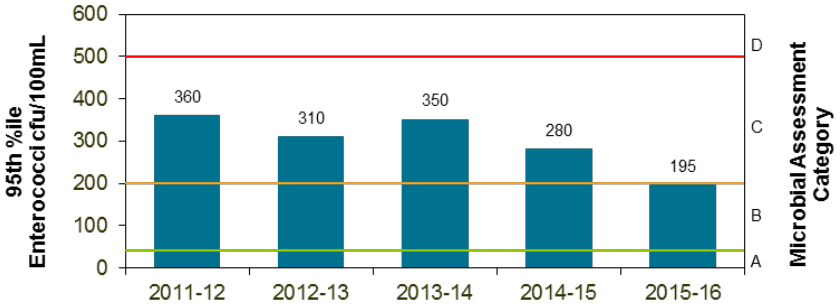
The site has been monitored since 1994. Microbial water quality has generally improved since 2000–2001 owing to licensing of discharges from the sewerage system and improved management of stormwater.

Sanitary Inspection: **Moderate**



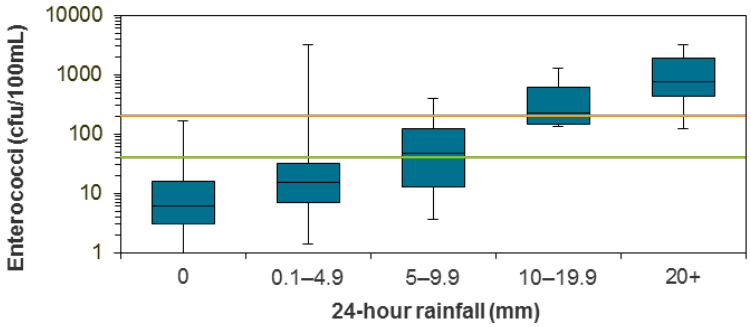
Microbial Assessment: **B**

Monitoring period for 2015–16 result is December 2013 to April 2016.

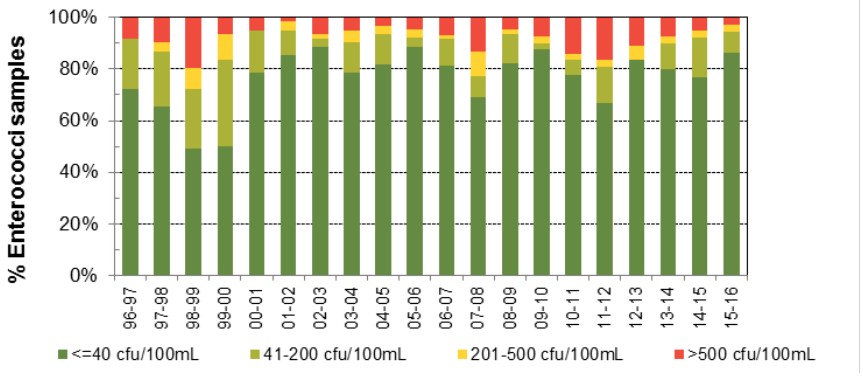


Response to rainfall

Rainfall from Gladesville rain gauge



Trends in enterococci data through time



Woodford Bay

Beach Suitability Grade: G

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

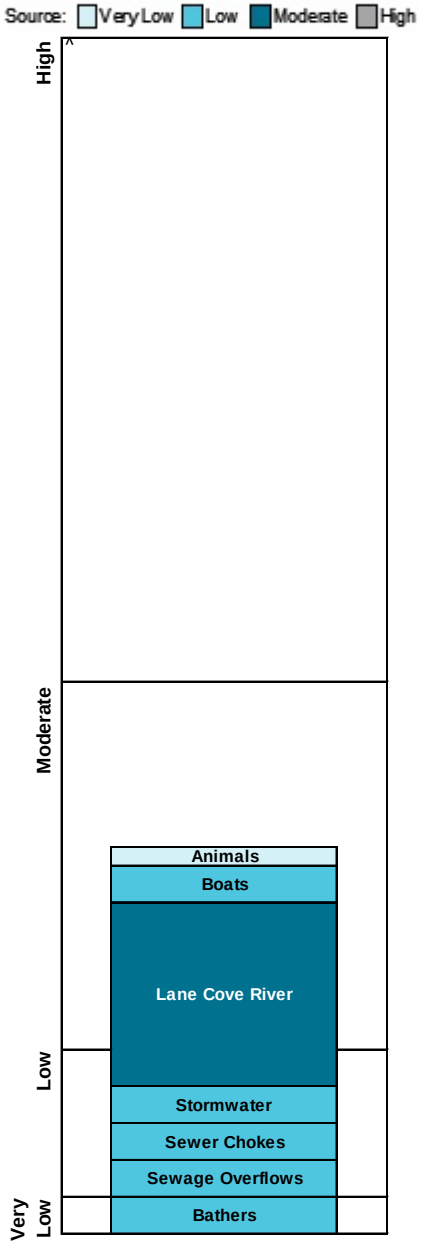
This site is a 20 by 25 metre enclosed swimming area on the western side of Woodford Bay in the lower Lane Cove River. The swimming area is backed by a narrow sandy beach and park.

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

The response to rainfall graph indicates that enterococci levels increased with increasing rainfall, often exceeding the safe swimming limit in response to 5mm of rainfall or more, and usually after 20mm or more.

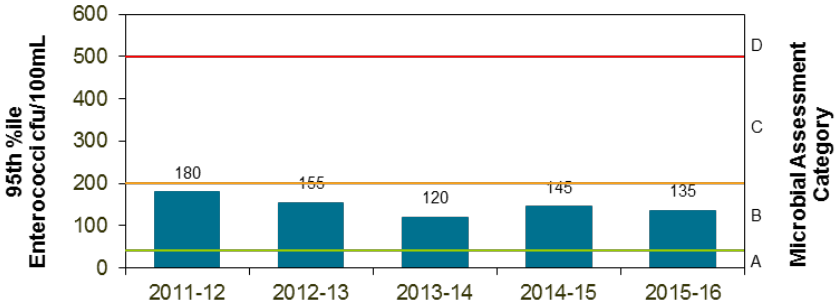
The site has been monitored since 1994. Microbial water quality has improved slightly since 2000–2001 owing to licensing of discharges from the sewerage system and improved management of stormwater.

Sanitary Inspection: **Moderate**



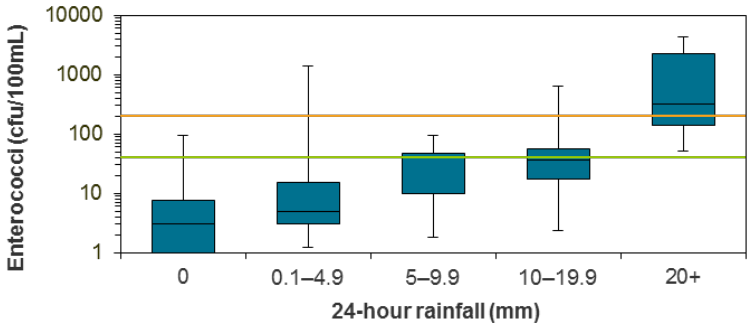
Microbial Assessment: **B**

Monitoring period for 2015–16 result is December 2013 to April 2016.

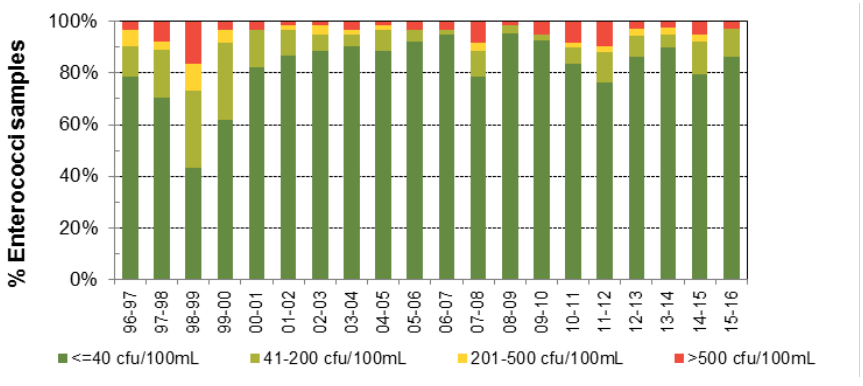


Response to rainfall

Rainfall from Gladesville rain gauge



Trends in enterococci data through time



Greenwich Baths

Beach Suitability Grade: G

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

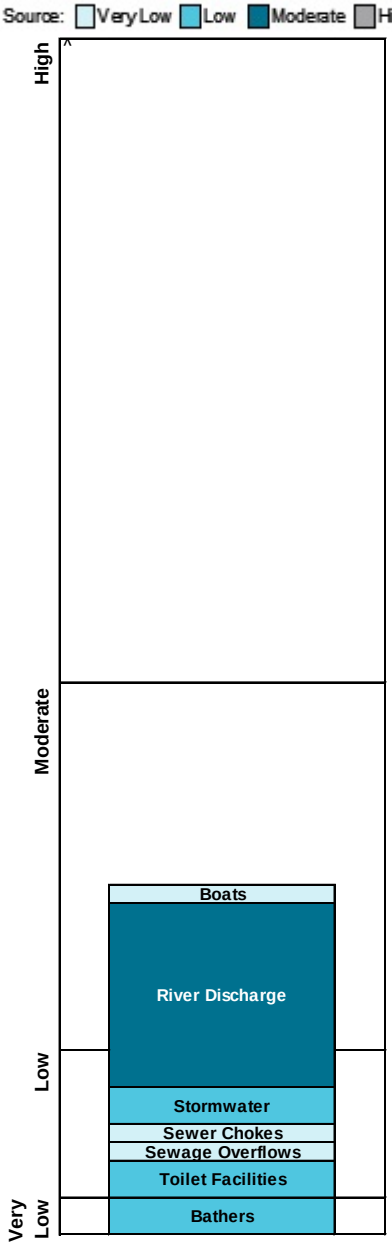
Greenwich Baths are a 40 metre long netted swimming area backed by a sandy beach. The baths are next to a park and are open during the swimming season. There are toilets and shower facilities and a kiosk.

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

The response to rainfall graph indicates that enterococci levels increased with increasing rainfall, regularly exceeding the safe swimming limit in response to 5mm of rainfall or more.

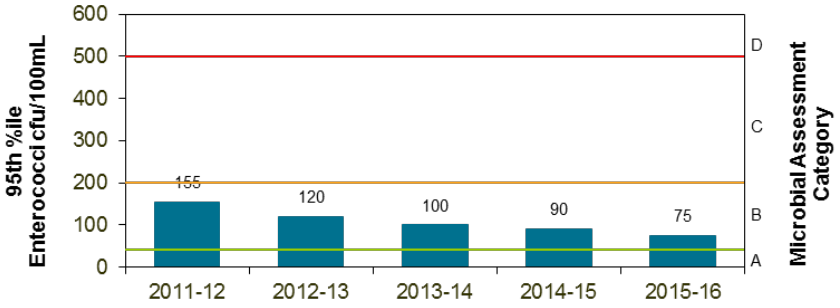
The site has been monitored since 1994. Microbial water quality has generally improved since 2000–2001 owing to licensing of discharges from the sewerage system and improved management of stormwater.

Sanitary Inspection: **Moderate**



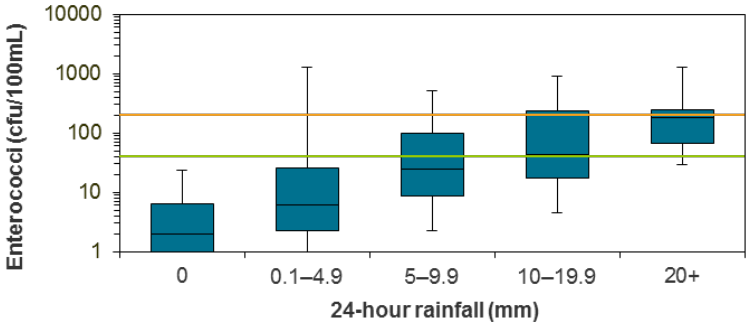
Microbial Assessment: **B**

Monitoring period for 2015–16 result is December 2013 to April 2016.

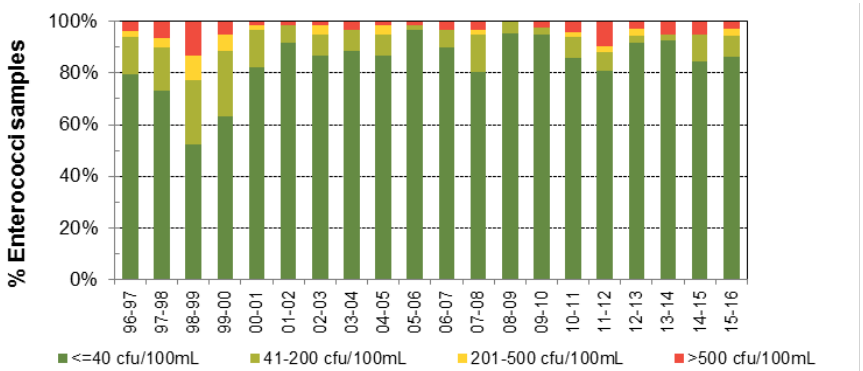


Response to rainfall

Rainfall from Lilyfield rain gauge



Trends in enterococci data through time



Hayes Street Beach

Beach Suitability Grade: G

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

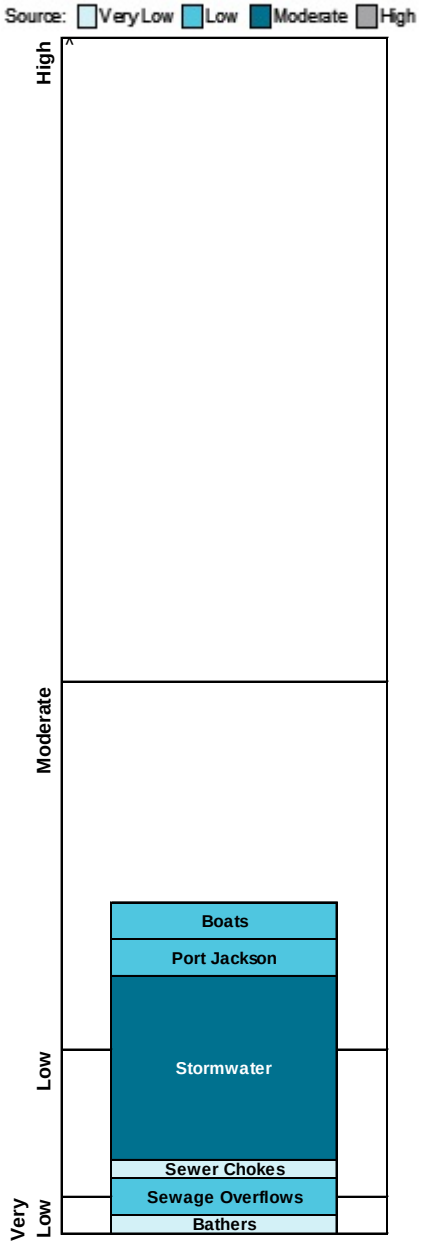
Hayes Street Beach is approximately 50 metres long and is located adjacent to the Hayes Street Ferry Wharf in Neutral Bay. The area is not netted.

The Beach Suitability Grade of Good indicates that the water quality is safe for swimming most of the time but can be susceptible to pollution from several potential sources of contamination.

The response to rainfall graph indicates that enterococci levels increased with increasing rainfall, frequently exceeding the safe swimming limit in response to 5mm of rainfall or more.

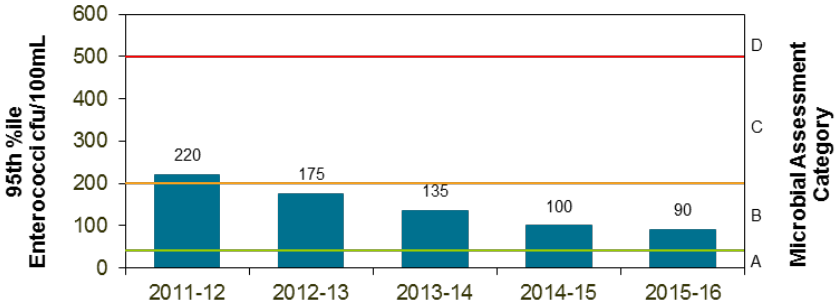
The site has been monitored since 1994. Microbial water quality has generally improved since 2000–2001 owing to the licensing of discharges from the sewerage system and improved management of stormwater.

Sanitary Inspection: **Moderate**



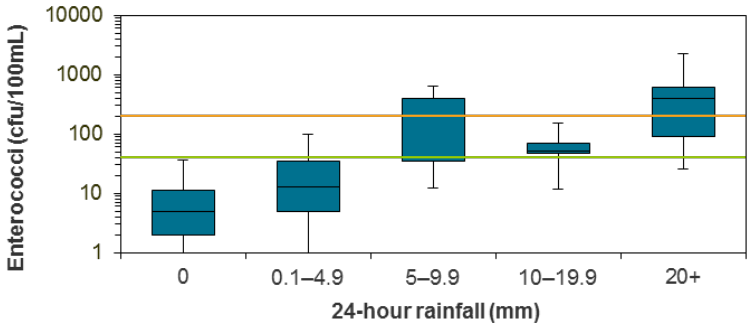
Microbial Assessment: **B**

Monitoring period for 2015–16 result is December 2013 to April 2016.

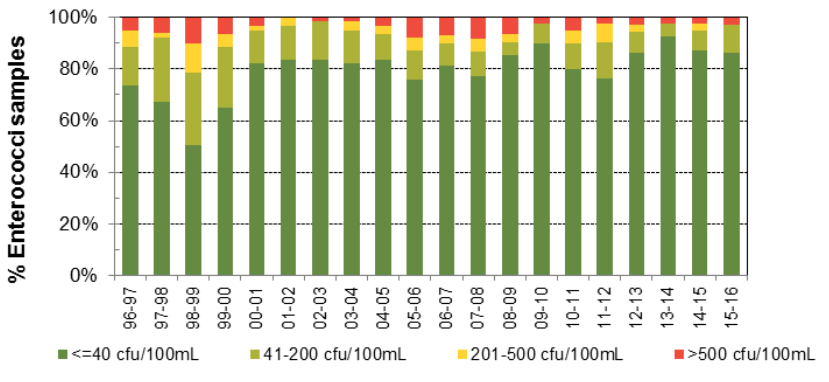


Response to rainfall

Rainfall from Mosman rain gauge



Trends in enterococci data through time



Clifton Gardens

Beach Suitability Grade: G

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

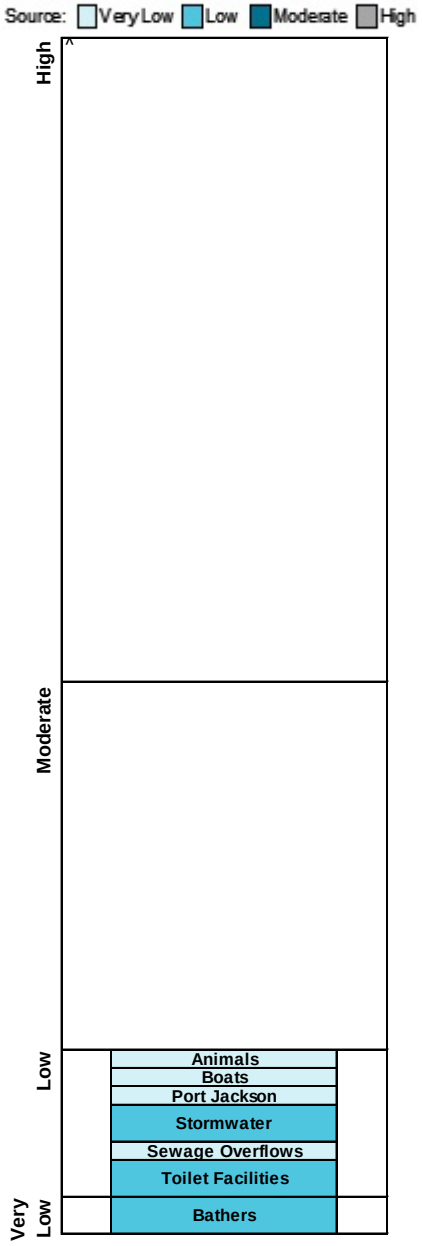
Clifton Gardens is a large netted swimming area at the western end of a 250 metre long beach in Chowder Bay. The beach is backed by Sydney Harbour National Park and a park with picnic and toilet facilities.

The Beach Suitability Grade of Good indicates that microbial water quality is suitable for swimming most of the time but the water may be susceptible to pollution from several minor sources of faecal contamination.

The response to rainfall graph indicates that enterococci levels increased with increasing rainfall, often exceeding the safe swimming limit in response to 5mm of rainfall or more, and frequently after 20mm or more.

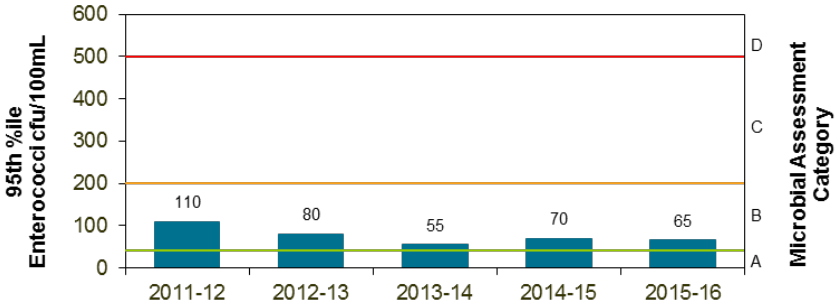
The site has been monitored since 1994. Microbial water quality has generally improved since 2000–2001 due to licensing of discharges from the sewerage system (and associated works such as the Northside Storage Tunnel) and improved management of stormwater.

Sanitary Inspection: **Moderate**



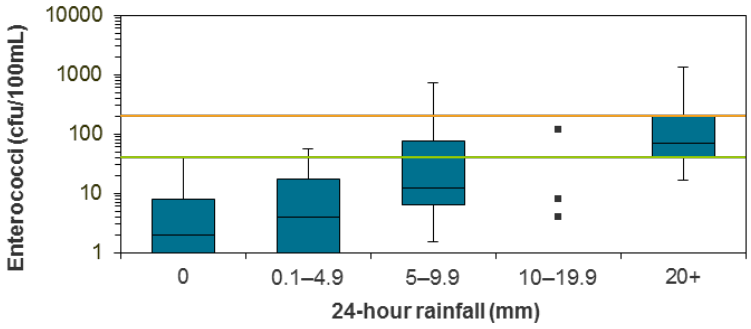
Microbial Assessment: **B**

Monitoring period for 2015–16 result is December 2013 to April 2016.

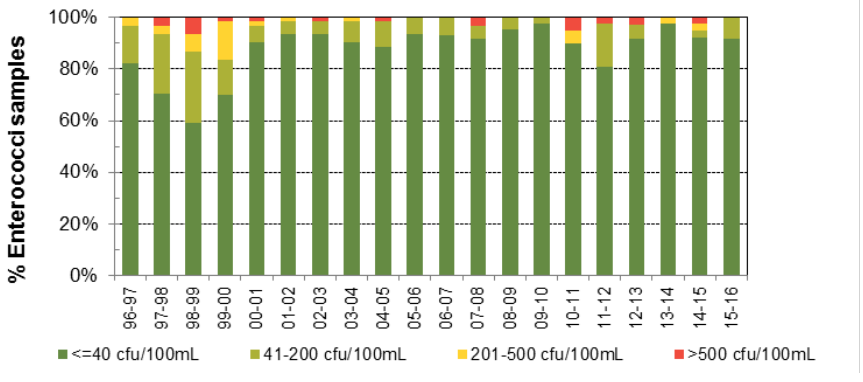


Response to rainfall

Rainfall from Mosman rain gauge



Trends in enterococci data through time



Balmoral Baths

Beach Suitability Grade: G

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

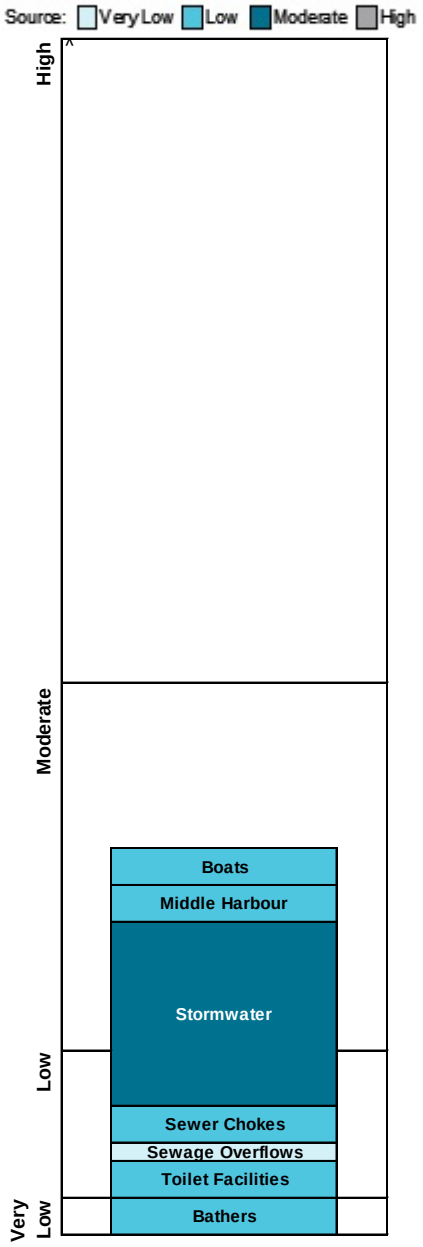
Balmoral Baths are a netted swimming area towards the eastern end of Balmoral Beach, backed by a park with picnic and toilet facilities.

The Beach Suitability Grade of Good indicates that microbial water quality is suitable for swimming most of the time but the water may be susceptible to pollution from a number of potential sources of faecal contamination, including stormwater.

The response to rainfall graph indicates that enterococci levels generally increased with increasing rainfall, often exceeding the safe swimming limit in response to 5mm of rainfall or more, and regularly after 20mm or more.

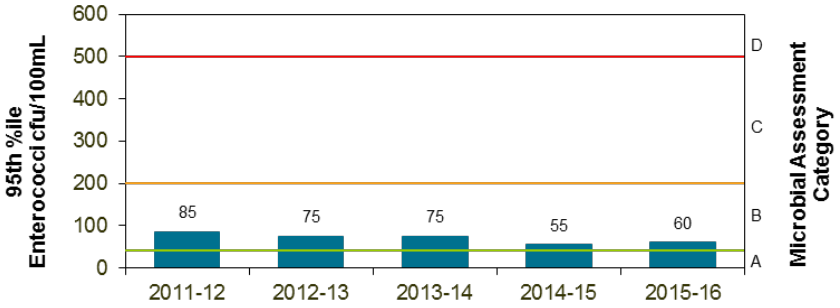
The site has been monitored since 1994. Microbial water quality has generally improved since 2000–2001 owing to licensing of discharges from the sewerage system (and associated works such as the Northside Storage Tunnel) and improved management of stormwater.

Sanitary Inspection: **Moderate**



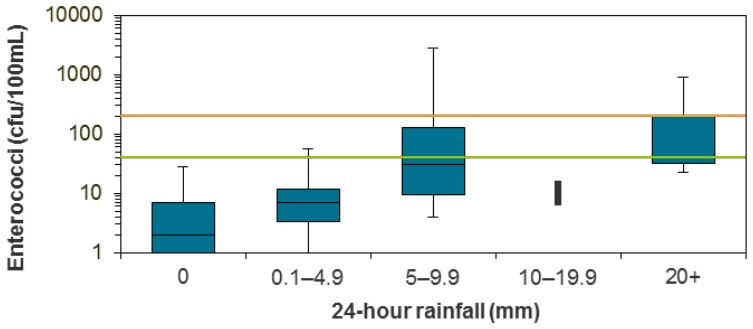
Microbial Assessment: **B**

Monitoring period for 2015–16 result is December 2013 to April 2016.

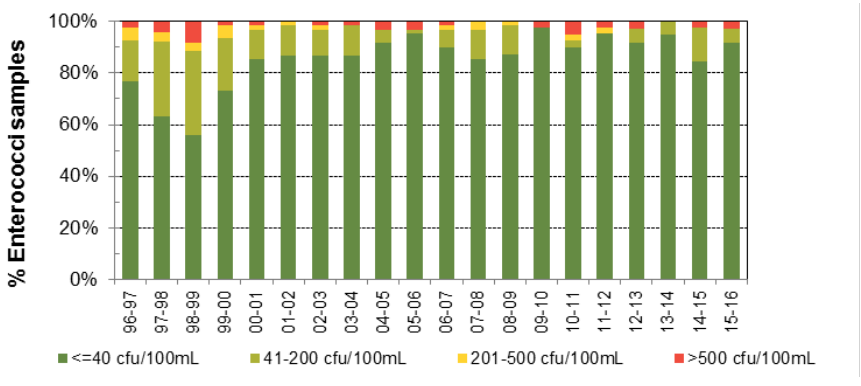


Response to rainfall

Rainfall from Mosman rain gauge



Trends in enterococci data through time



Edwards Beach

Beach Suitability Grade: G

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

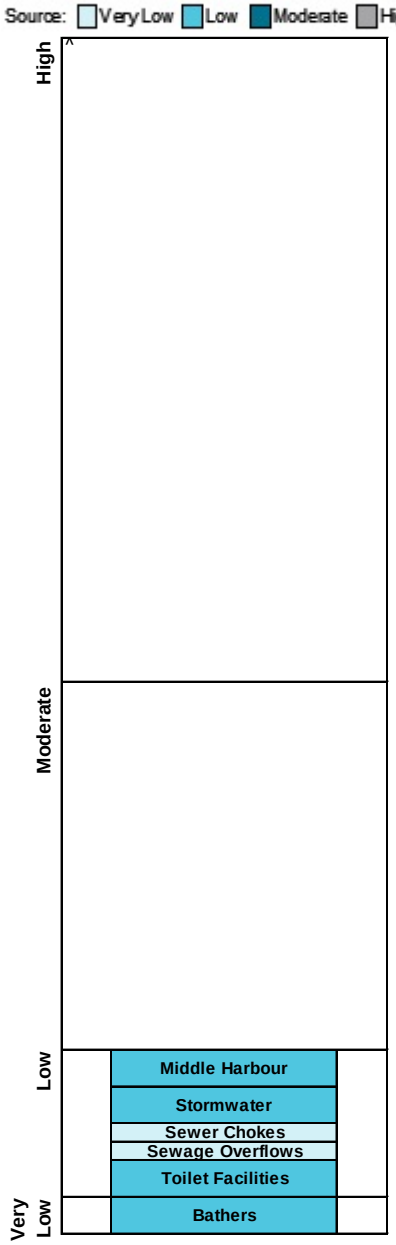
Edwards Beach is a popular swimming area backed by a walking track, park and café facilities.

The Beach Suitability Grade of Good indicates that microbial water quality is suitable for swimming most of the time but the water may be susceptible to pollution from a number of potential sources of faecal contamination.

The response to rainfall graph indicates that enterococci levels increased slightly with increasing rainfall, often exceeding the safe swimming limit in response to 20mm of rainfall or more.

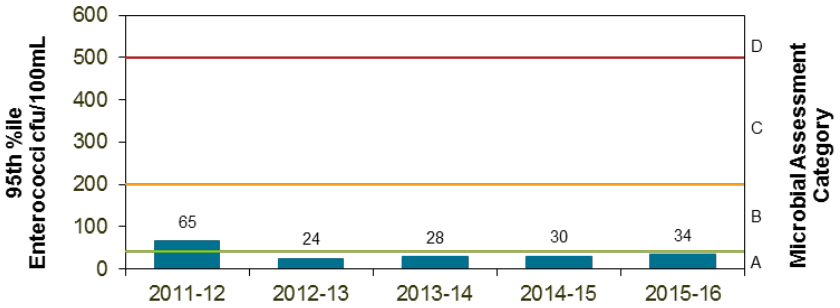
The site has been monitored since 1994. Microbial water quality has generally improved since 2000–2001 owing to licensing of discharges from the sewerage system (and associated works such as the Northside Storage Tunnel) and improved management of stormwater.

Sanitary Inspection: **Moderate**



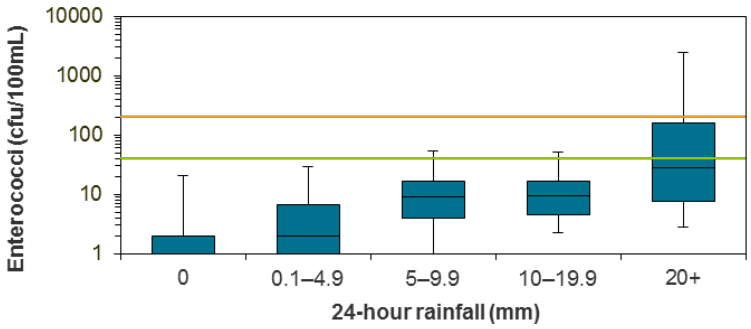
Microbial Assessment: **A**

Monitoring period for 2015–16 result is December 2013 to April 2016.

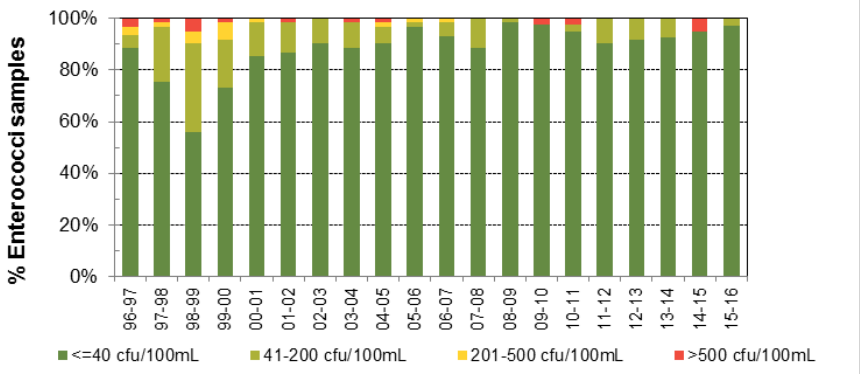


Response to rainfall

Rainfall from Mosman rain gauge



Trends in enterococci data through time



Chinamans Beach

Beach Suitability Grade: G

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

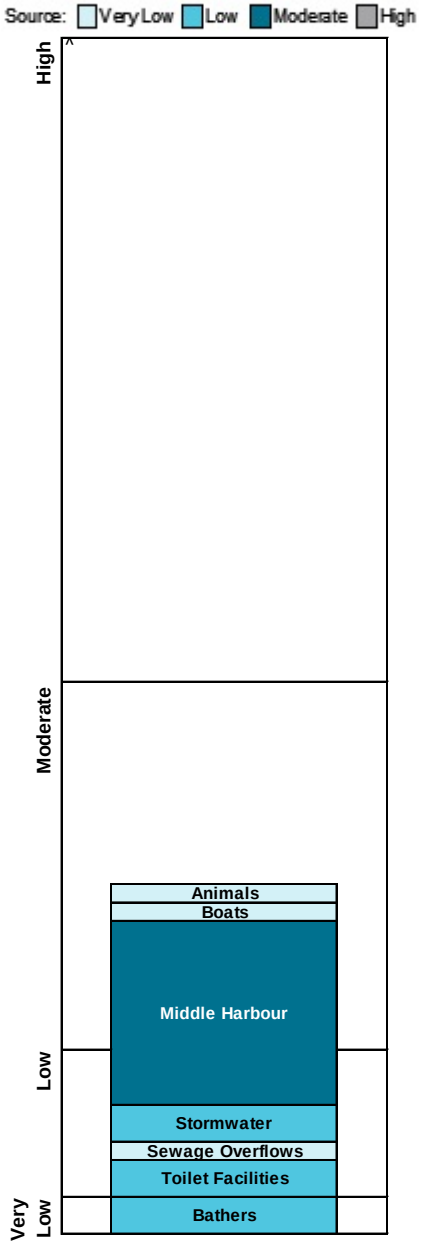
Chinamans Beach is approximately 250 metres long and is a popular swimming area in Middle Harbour. It is backed by Rosherville Reserve.

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

The response to rainfall graph indicates that enterococci levels increased with increasing rainfall, regularly exceeding the safe swimming limit in response to 20mm of rainfall or more.

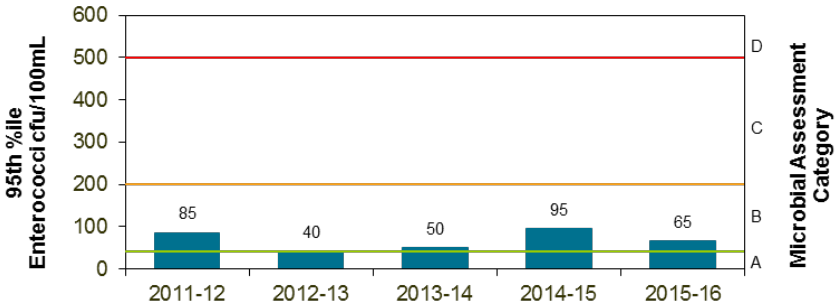
The site has been monitored since 1998. Microbial water quality has generally improved since 2000–2001 owing to licensing of discharges from the sewerage system (and associated works such as the Northside Storage Tunnel) and improved management of stormwater.

Sanitary Inspection: **Moderate**



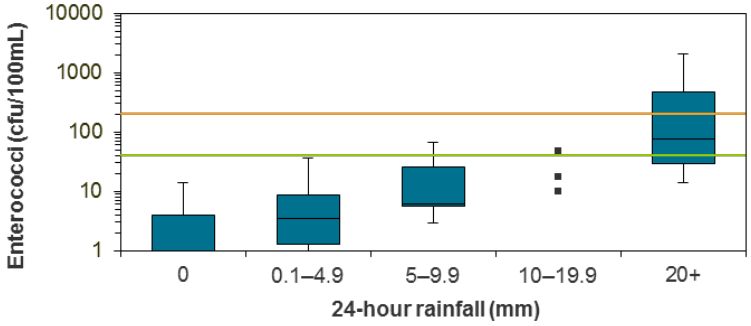
Microbial Assessment: **B**

Monitoring period for 2015–16 result is December 2013 to April 2016.

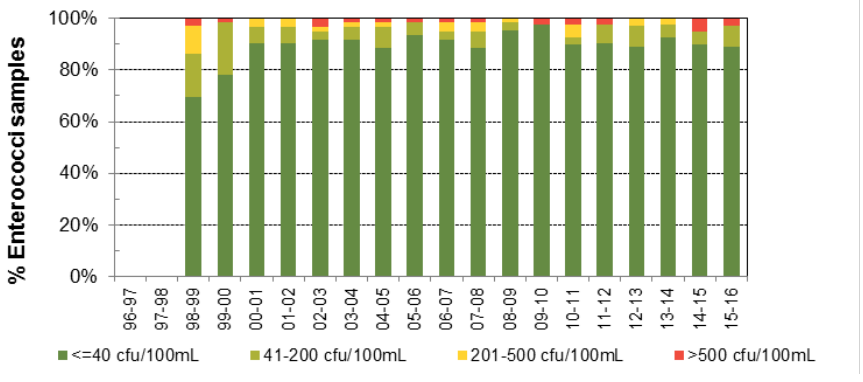


Response to rainfall

Rainfall from Mosman rain gauge



Trends in enterococci data through time



Northbridge Baths

Beach Suitability Grade: F

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

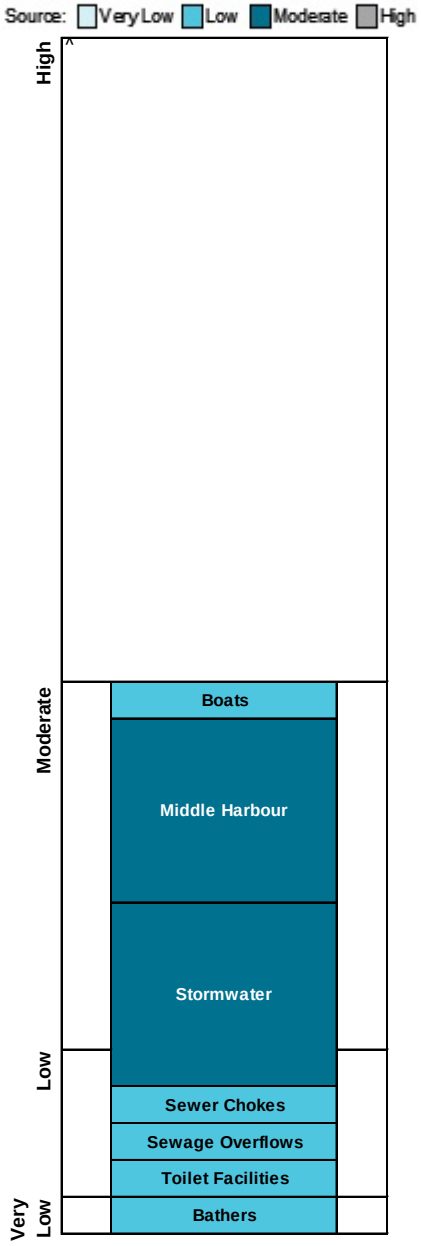
Northbridge Baths are a 30 by 65 metre enclosed swimming area in Sailors Bay, Middle Harbour. The baths are open year round; however, signage advises not to swim during and for up to 48 hours after rainfall.

The Beach Suitability Grade of Fair indicates that microbial water quality is occasionally influenced by faecal pollution, particularly after rainfall, with a number of potential sources of faecal contamination including stormwater and upstream sources in Middle Harbour.

The response to rainfall graph indicates that enterococci levels increased with increasing rainfall, often exceeding the safe swimming limit in response to light rainfall, and regularly after 5mm or more.

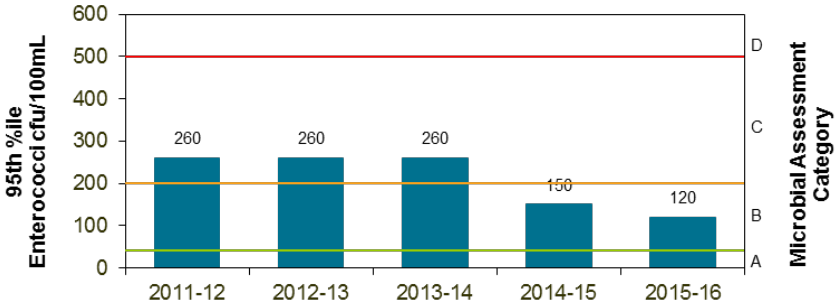
The site has been monitored since 1994. Microbial water quality has improved slightly since 2000–2001 owing to licensing of discharges from the sewerage system (and associated works such as the Northside Storage Tunnel) and improved management of stormwater.

Sanitary Inspection: **High**



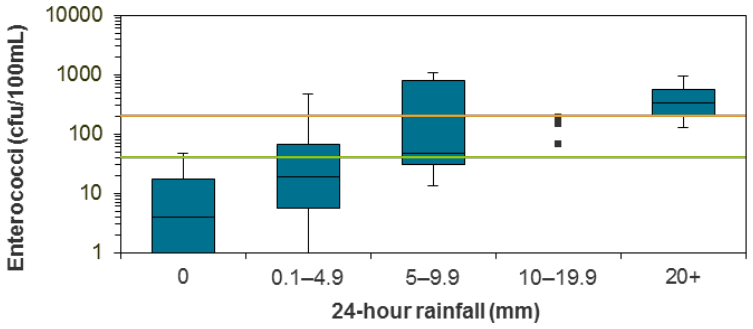
Microbial Assessment: **B**

Monitoring period for 2015–16 result is December 2013 to April 2016.

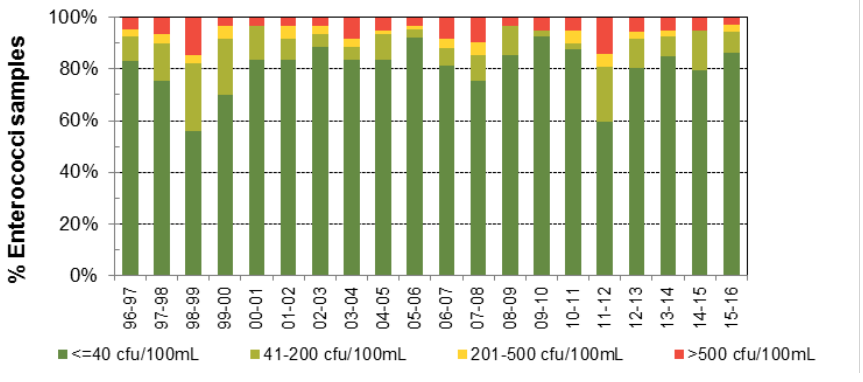


Response to rainfall

Rainfall from Mosman rain gauge



Trends in enterococci data through time



Davidson Reserve

Beach Suitability Grade: P

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

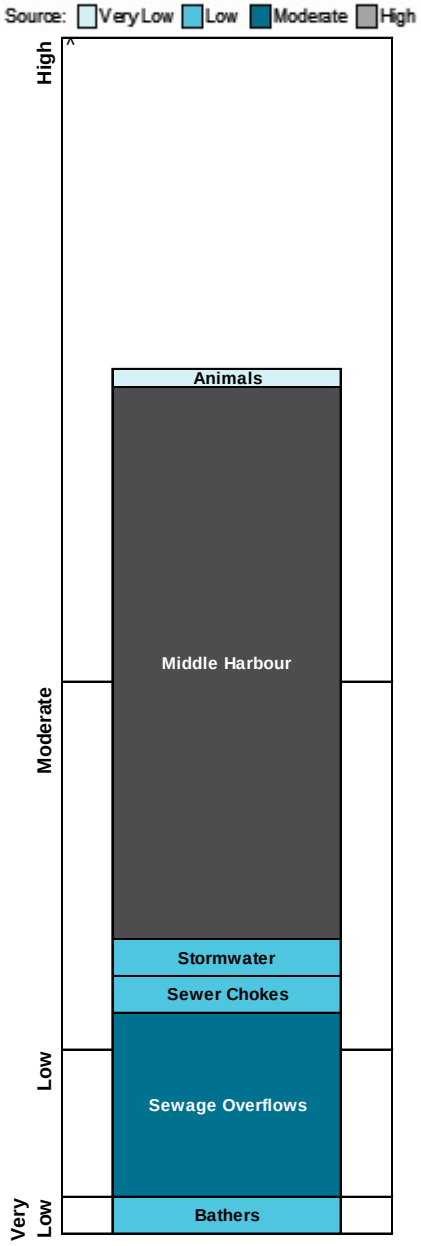
Davidson Reserve is a 25 metre long netted swimming area situated within Garigal National Park. The beach is backed by a reserve with picnic facilities.

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

The response to rainfall graph indicates that enterococci levels increased with increasing rainfall, often exceeding the safe swimming limit in response to light rainfall and usually after 5mm or more.

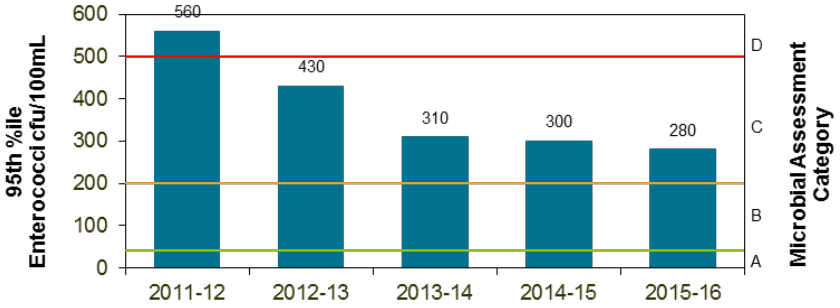
The site has been monitored since 1994.

Sanitary Inspection: **High**



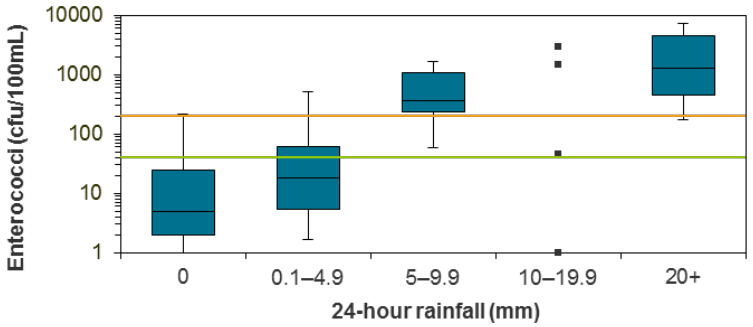
Microbial Assessment: **C**

Monitoring period for 2015–16 result is December 2013 to April 2016.

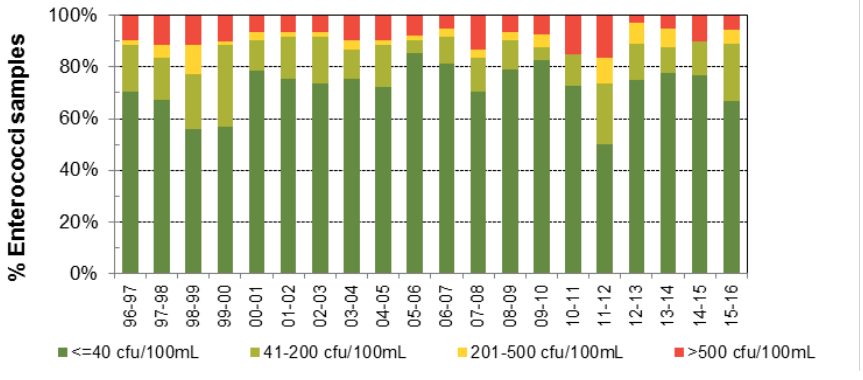


Response to rainfall

Rainfall from Mosman rain gauge



Trends in enterococci data through time



Gurney Crescent Baths

Beach Suitability Grade: F

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

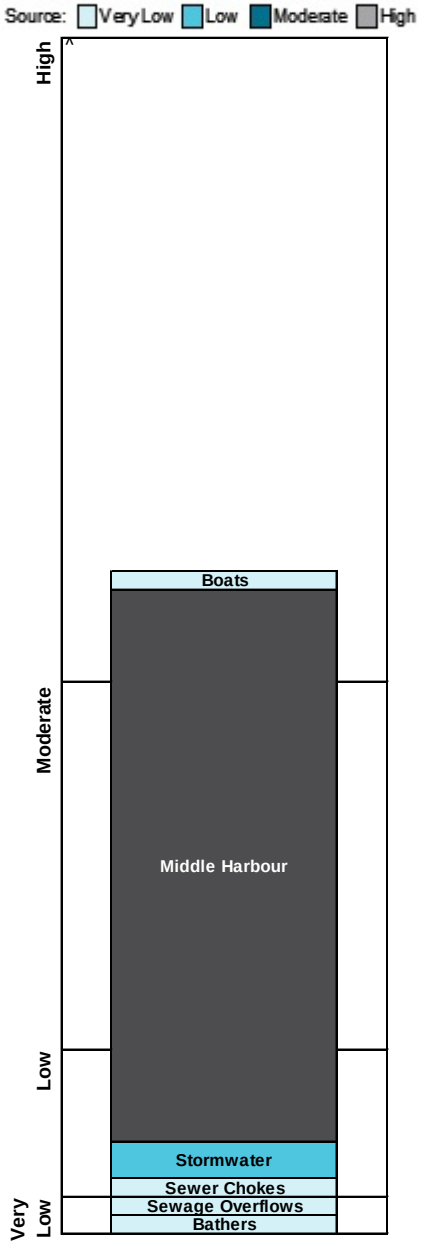
Gurney Crescent Baths are a 20 metre square netted swimming area located at Pickering Point, Middle Harbour. The baths are backed by a bush reserve and are not a popular swimming location.

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

The response to rainfall graph indicates that enterococci levels increased with increasing rainfall, regularly exceeding the safe swimming limit in response to 5mm of rainfall or more.

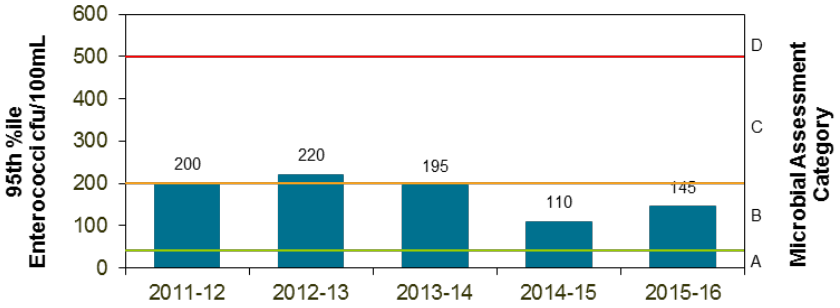
The site has been monitored since 1996.

Sanitary Inspection: **High**



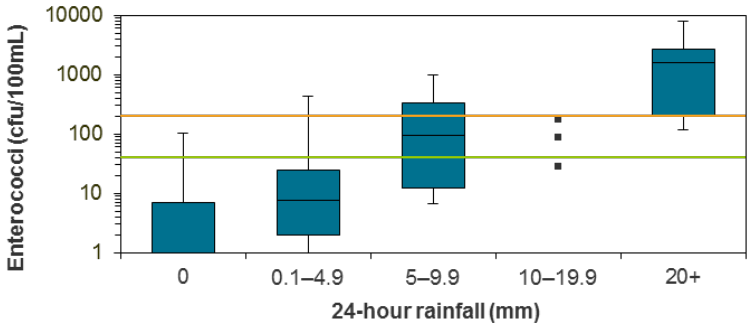
Microbial Assessment: **B**

Monitoring period for 2015–16 result is December 2013 to April 2016.

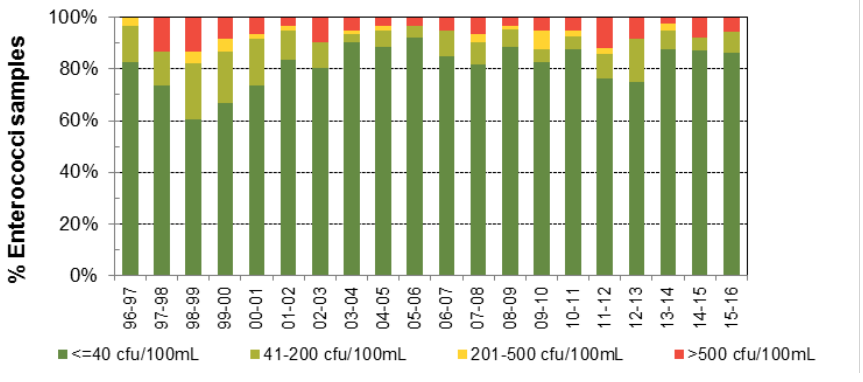


Response to rainfall

Rainfall from Mosman rain gauge



Trends in enterococci data through time



Clontarf Pool

Beach Suitability Grade: F

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

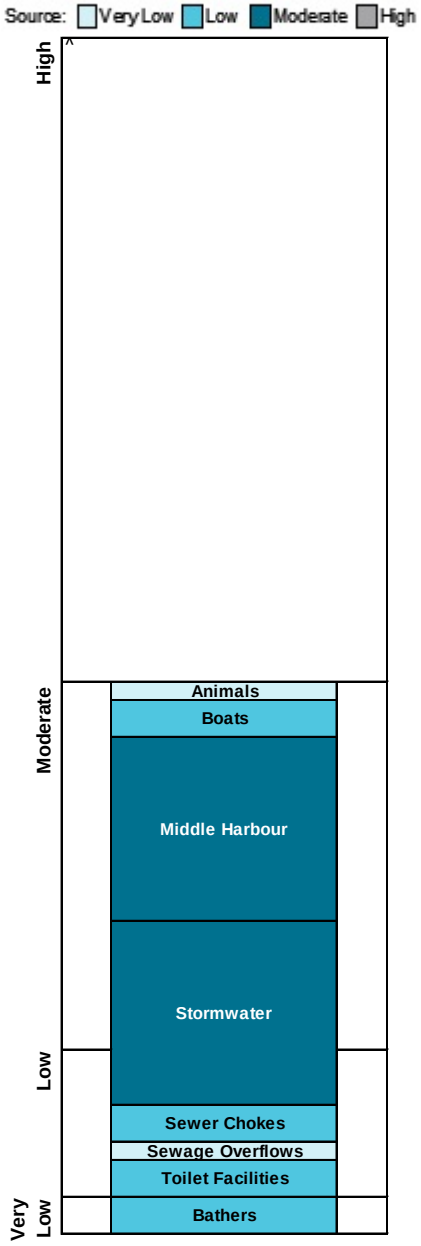
Clontarf Pool is a small netted swimming area accessed via Clontarf Reserve. The pool is backed by a narrow sandy beach and a park with a picnic area, barbecue facilities and a playground.

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

The response to rainfall graph indicates that enterococci levels increased with increasing rainfall, frequently exceeding the safe swimming limit in response to 10mm of rainfall or more.

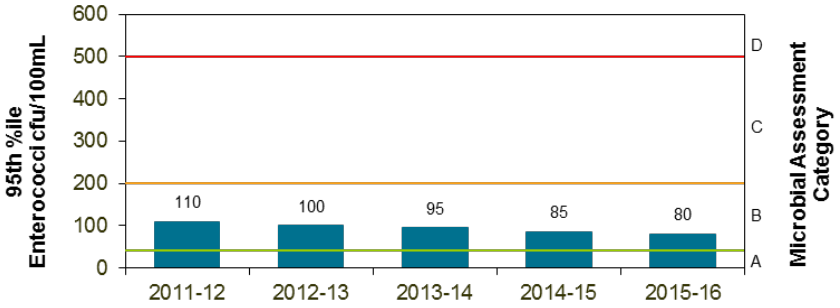
The site has been monitored since 1994. Microbial water quality has improved slightly since 2000–2001 owing to licensing of discharges from the sewerage system (and associated works such as the Northside Storage Tunnel) and improved management of stormwater.

Sanitary Inspection: **High**



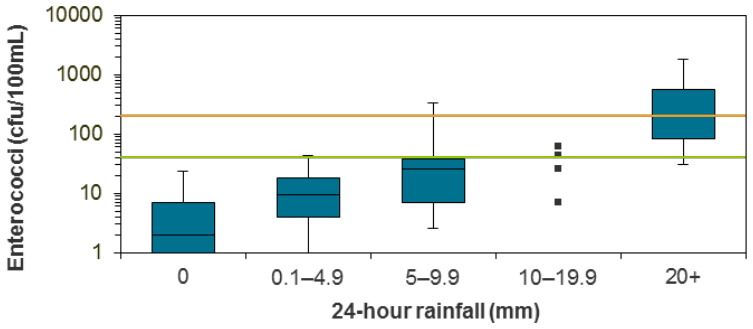
Microbial Assessment: **B**

Monitoring period for 2015–16 result is December 2013 to April 2016.

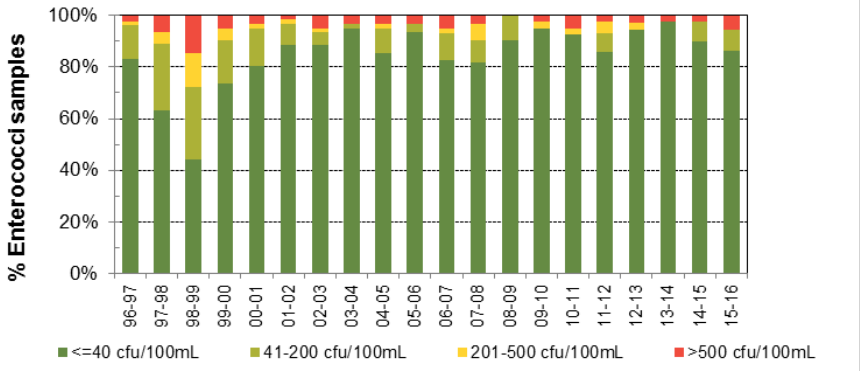


Response to rainfall

Rainfall from Mosman rain gauge



Trends in enterococci data through time



Forty Baskets Pool

Beach Suitability Grade: G

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

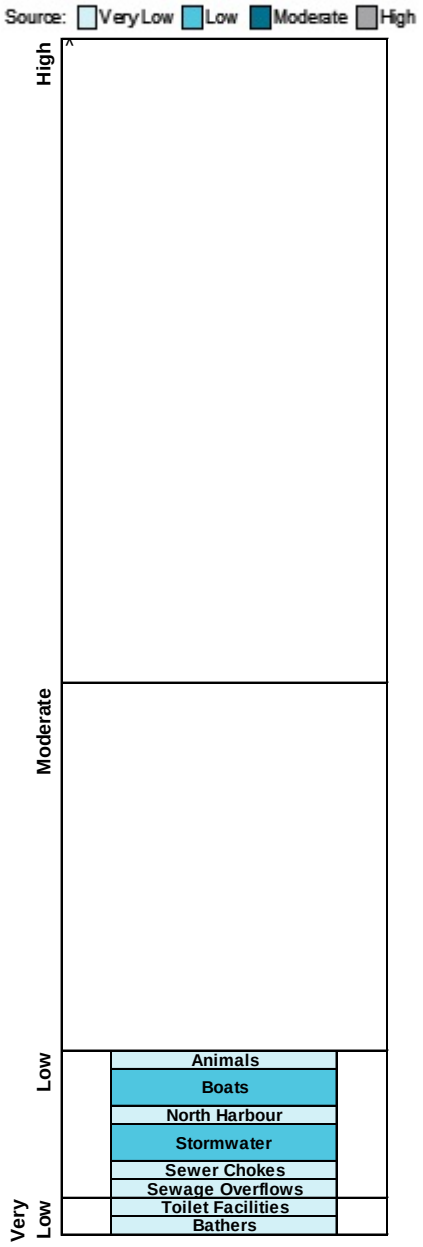
Forty Baskets Pool is a 20 by 40 metre netted swimming area at the northern end of Forty Baskets Beach in North Harbour. The beach is backed by boat storage and a small park with barbecue facilities.

The Beach Suitability Grade of Good indicates that microbial water quality is suitable for swimming most of the time but the water may be susceptible to pollution from a number of potential sources of minor faecal contamination.

The response to rainfall graph indicates that enterococci levels increased with increasing rainfall, frequently exceeding the safe swimming limit in response to 20mm of rainfall or more.

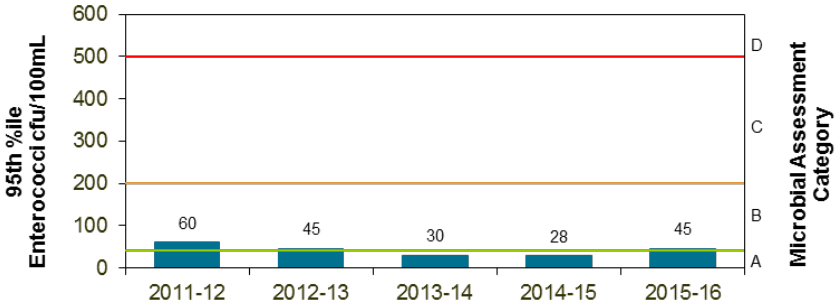
The site has been monitored since 1994. Microbial water quality has improved slightly since 2000–2001 owing to licensing of discharges from the sewerage system (and associated works such as the Northside Storage Tunnel) and improved management of stormwater.

Sanitary Inspection: **Moderate**



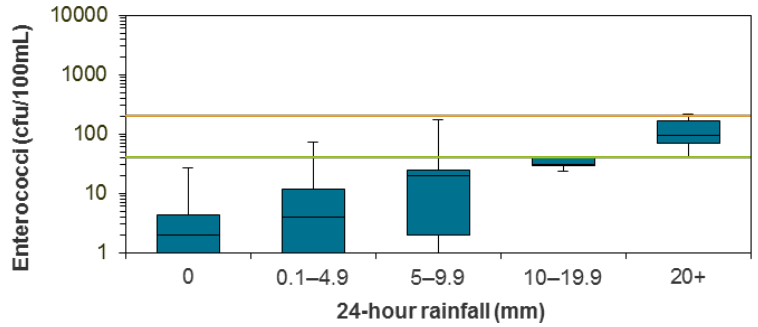
Microbial Assessment: **B**

Monitoring period for 2015–16 result is December 2013 to April 2016.

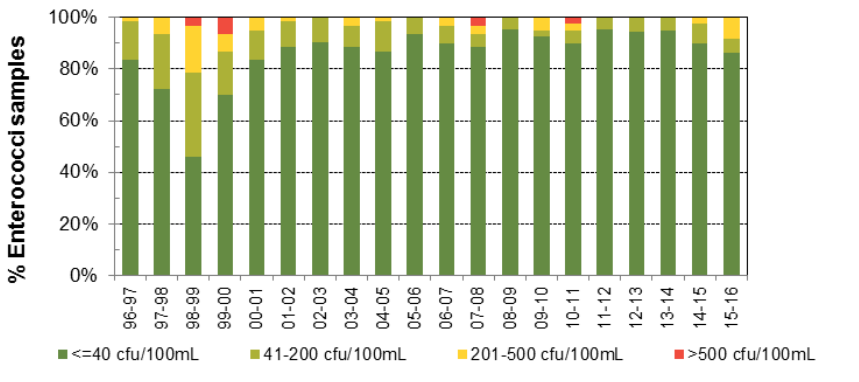


Response to rainfall

Rainfall from Manly rain gauge



Trends in enterococci data through time



Fairlight Beach

Beach Suitability Grade: G

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

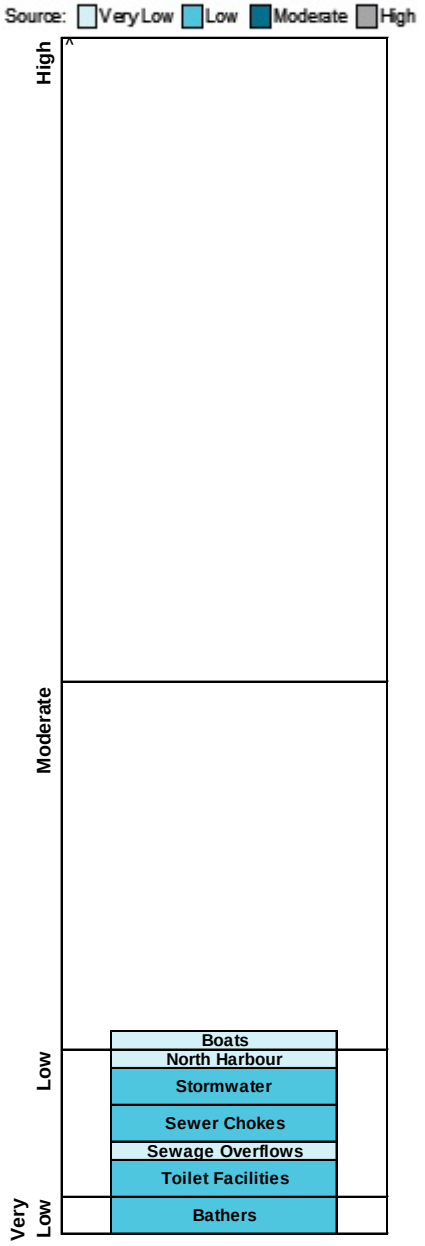
Fairlight Beach is a narrow beach located in North Harbour. The beach is backed by a small reserve and picnic area. A 25 metre pool filled with water from the harbour is adjacent to the beach.

The Beach Suitability Grade of Good indicates that microbial water quality is suitable for swimming most of the time but the water may be susceptible to pollution from a number of minor sources of faecal contamination.

The response to rainfall graph indicates that enterococci levels generally increased with increasing rainfall, regularly exceeding the safe swimming limit in response to 10mm of rainfall or more.

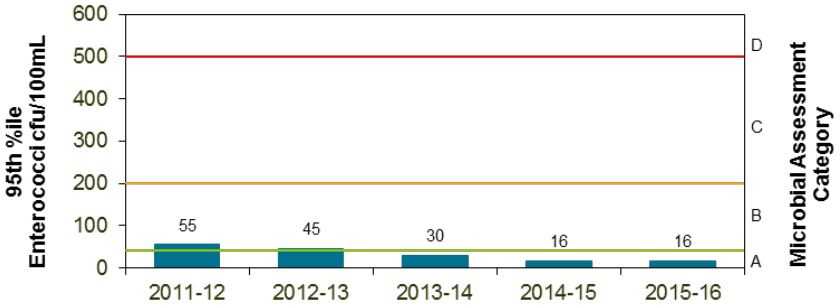
The site has been monitored since 1996. Microbial water quality has generally improved since 2000–2001 owing to licensing of discharges from the sewerage system and improved management of stormwater.

Sanitary Inspection: **Moderate**



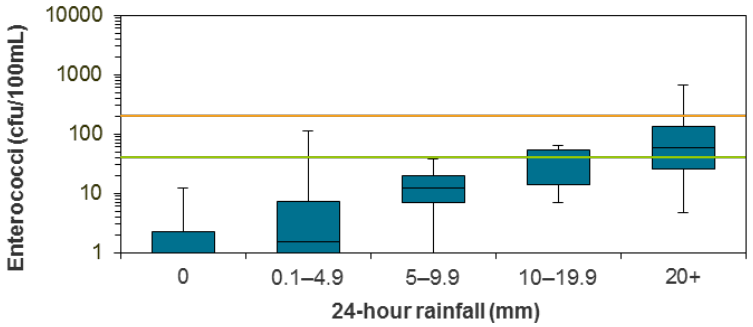
Microbial Assessment: **A**

Monitoring period for 2015–16 result is December 2013 to April 2016.

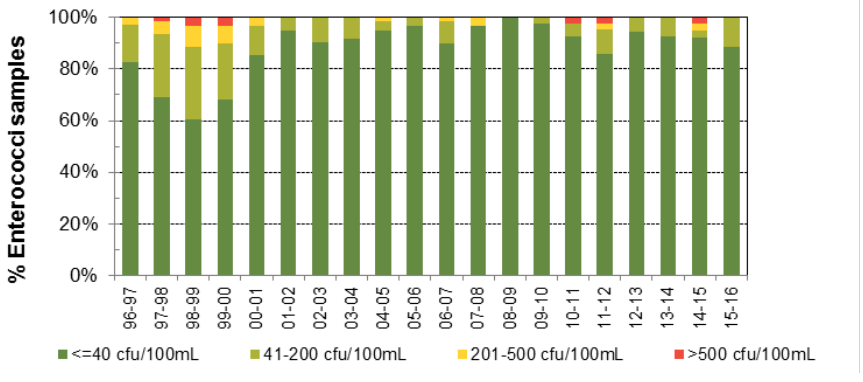


Response to rainfall

Rainfall from Manly rain gauge



Trends in enterococci data through time



Manly Cove

Beach Suitability Grade: G

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

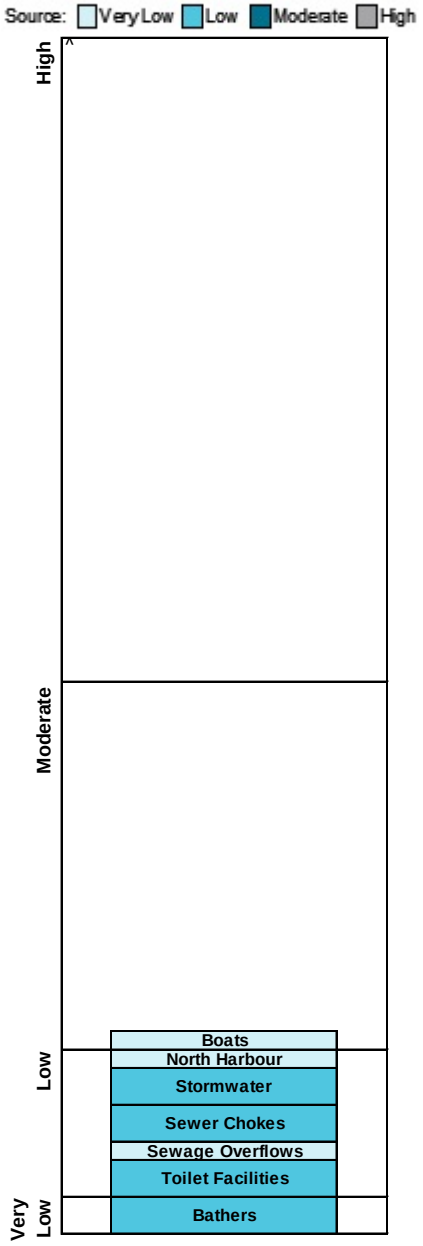
Manly Cove is a netted swimming enclosure near the centre of the 250 metre long beach that stretches to the west of the Manly Ferry Terminal. The beach is backed by a walking track and park.

The Beach Suitability Grade of Good indicates that microbial water quality is suitable for swimming most of the time but the water may be susceptible to pollution from a number of minor sources of faecal contamination.

The response to rainfall graph indicates that enterococci levels generally increased with increasing rainfall, regularly exceeding the safe swimming limit in response to 10mm of rainfall or more.

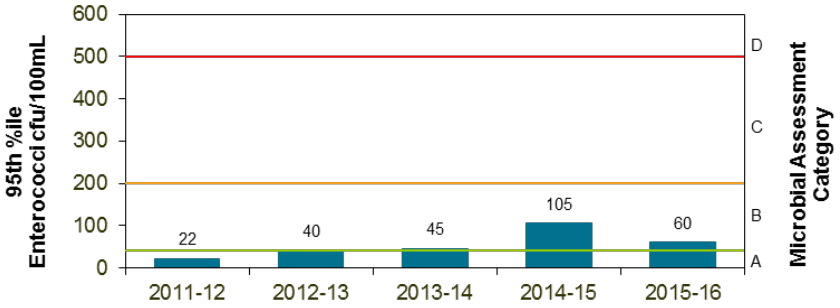
The site has been monitored since 1994. Microbial water quality has generally improved since 2000–2001 owing to licensing of discharges from the sewerage system and improved management of stormwater.

Sanitary Inspection: **Moderate**



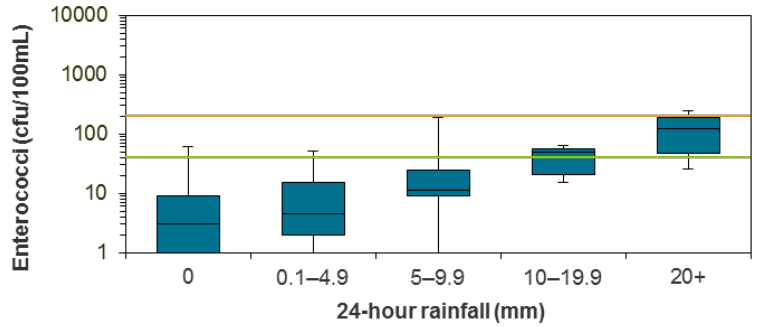
Microbial Assessment: **B**

Monitoring period for 2015–16 result is December 2013 to April 2016.

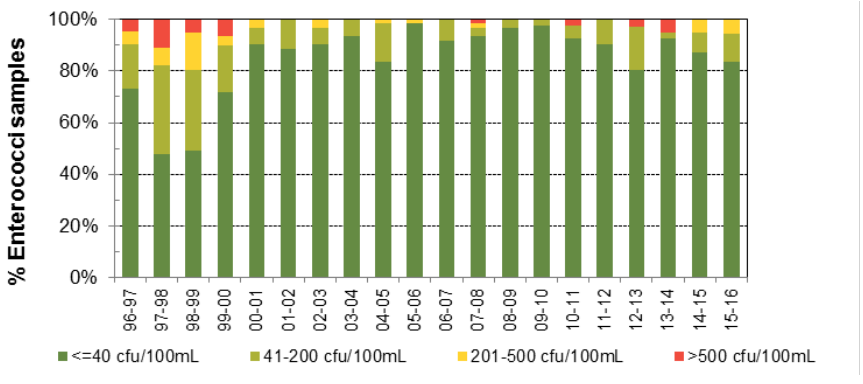


Response to rainfall

Rainfall from Manly rain gauge



Trends in enterococci data through time



Little Manly Cove

Beach Suitability Grade: G

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

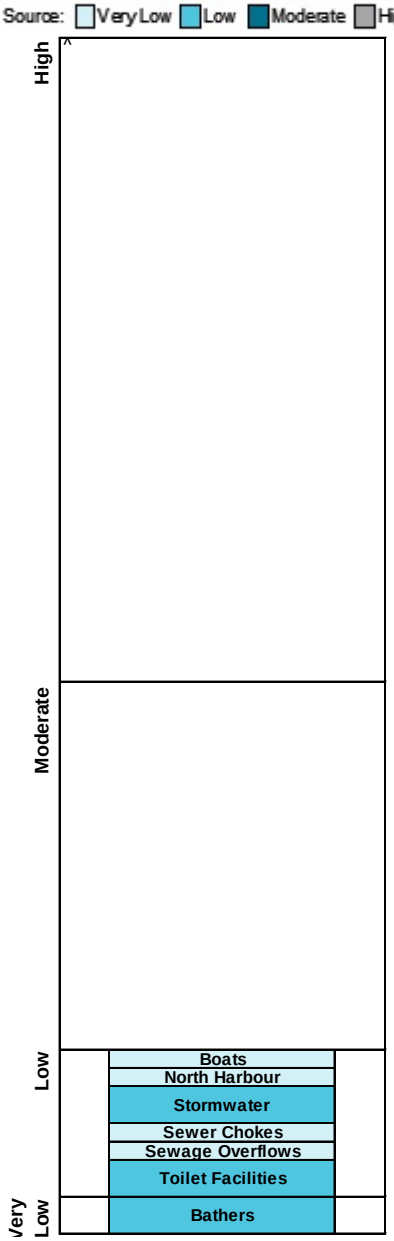
The 30 metre square swimming enclosure is at the eastern end of the beach in Little Manly Cove. The beach is backed by a small reserve. Boat launching facilities are at the western end of the beach.

The Beach Suitability Grade of Good indicates that microbial water quality is suitable for swimming most of the time but the water may be susceptible to pollution from a number of minor sources of faecal contamination.

The response to rainfall graph indicates that enterococci levels generally increased with increasing rainfall, often exceeding the safe swimming limit in response to 10mm of rainfall or more.

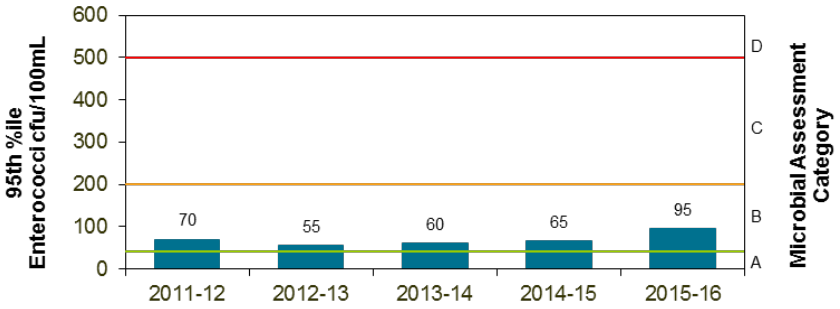
The site has been monitored since 1994. Microbial water quality has improved slightly since 2000–2001 owing to licensing of discharges from the sewerage system and improved management of stormwater.

Sanitary Inspection: **Moderate**



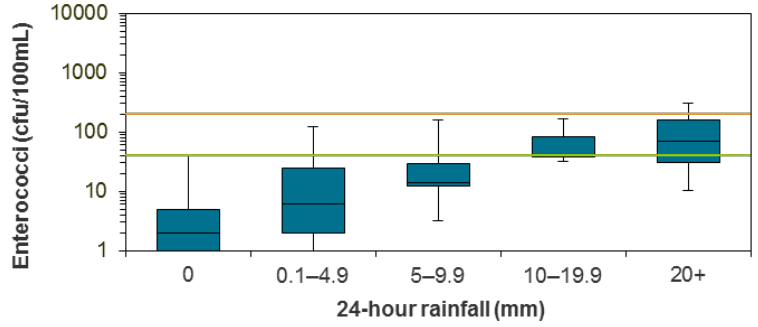
Microbial Assessment: **B**

Monitoring period for 2015–16 result is December 2013 to April 2016.

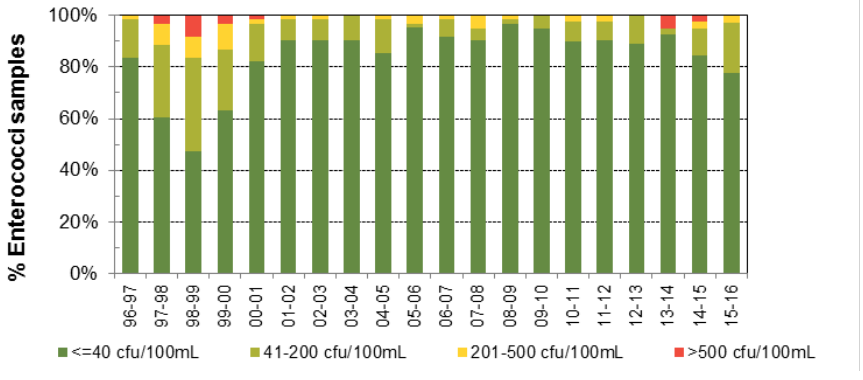


Response to rainfall

Rainfall from Manly rain gauge



Trends in enterococci data through time



Southern Sydney (Sutherland and Southern Harbours)

State of the Beaches 2015–2016

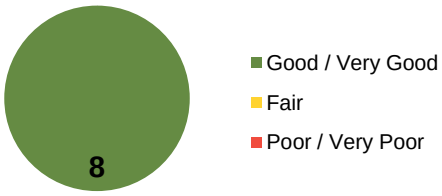
Overall results

Percentage of sites graded as Good or Very Good:

75%	89%	89%	**86%**
2012–13	2013–14	2014–15	2015–16

Twenty-four of the 28 swimming sites in Bate Bay, Botany Bay, lower Georges River and Port Hacking were graded as Very Good or Good in 2015–2016. This was a fall in performance from the previous year, with frequent wet weather and significant storm events impacting water quality.

Ocean beaches



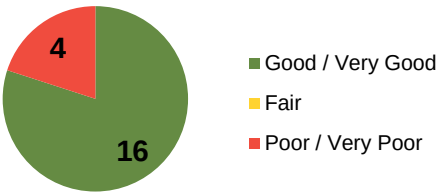
All eight ocean beaches in Bate Bay were graded as Very Good or Good.

Greenhills Beach, Wanda Beach, Elouera Beach, North Cronulla, Shelly Beach and Oak Park were graded as Very Good. These sites all had excellent water quality and were suitable for swimming almost all of the time.

South Cronulla was graded as Good. Microbial water quality was suitable for swimming most of the time, with enterococci levels rarely exceeding the safe swimming limit.

Boat Harbour was upgraded to Good in 2015–2016 from Poor in the previous three years. The creek at the northern end of the beach has been identified as a source of ongoing low levels of contamination in the past; however the installation of bags for disposal of dog droppings by locals may have contributed to improved water quality.

Estuarine beaches



Congwong Bay in Botany Bay was graded as Very Good. This site had excellent water quality and was suitable for swimming almost all of the

Best beaches

Greenhills Beach, Wanda Beach, Elouera Beach, North Cronulla, Shelly Beach, Oak Park and Congwong Bay

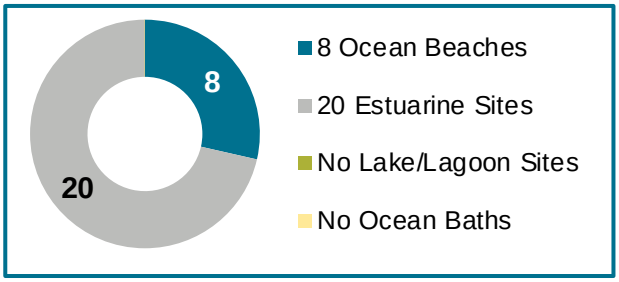
These sites had excellent water quality and were suitable for swimming almost all of the time.

28 sites

every 6 days*

1180 samples

year round*



* 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.

See **How to Read this Report** for explanations of graphs and Beach Suitability Grades.

time.

Sixteen of the 20 estuarine beaches were graded as Good: Jew Fish Bay Baths, Como Baths, Oatley Bay Baths, Carss Point Baths in the lower Georges River; Silver Beach, Sandringham Baths, Dolls Point Baths, Ramsgate Baths, Monterey Baths, Brighton-Le-Sands Baths, Kyeemagh Baths, and Frenchmans Bay in Botany Bay; and Hordens Beach, Lilli Pilli Baths and Jibbon Beach in Port Hacking. These sites had mostly good water quality, although elevated enterococci levels were recorded following rainfall. Jibbon Beach fell in performance in 2015–2016 with water quality impacted by significant rainfall events.

Gymea Bay Baths and Gunnamatta Bay Baths in Port Hacking and Yarra Bay in Botany Bay were downgraded to Poor in 2015–2016. Gymea Bay Baths and Gunnamatta Bay Baths are located at less well-flushed areas of the estuary, with pollution inputs associated with frequent heavy rainfall taking longer to dilute and disperse. As a result these sites take longer to recover from stormwater events than surrounding areas. Water quality at these sites was generally suitable for swimming during dry weather only, with elevated enterococci levels sometimes measured following light rainfall.

As a precaution, swimming should be avoided at sites in Botany Bay, lower Georges River and Port Hacking during and for up to three days following rainfall or if there are signs of stormwater pollution, such as discoloured water or floating debris.

Foreshores Beach continued to be graded as Very Poor. Although microbial water quality was often suitable for swimming during dry weather conditions, the site is very susceptible to faecal contamination from the sewage overflows which discharge into Mill Pond Creek. To reduce the risk of contracting swimming-related illnesses at this site, carefully follow the pollution advisories in the Beachwatch Pollution Forecast (www.environment.nsw.gov.au/beach), avoid swimming during and up to three days following light rainfall, or if there are signs of pollution such as discoloured water, odour or floating debris.

Management

Ocean beaches

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.

Sutherland Shire Council has installed more than 20 systems to improve stormwater quality, including artificial wetlands, gross pollutant traps (GPTs), continuous deflective separators and natural sand drainage systems. It has also undertaken education programs, drain stencilling and water quality monitoring of the drainage system.

Botany Bay and lower Georges River

Randwick Council and Sydney Water collaborated to do intense dry weather monitoring of stormwater drains to identify sewer leaks. Leaks from public sewers are repaired by Sydney Water and leaks from private sewers are addressed by the council.

Sydney Water has inspected, cleaned and repaired sewer mains on the northern and western side 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.

GPTs have been installed in the Yarra Bay catchment.

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 the last year, approximately 240 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 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.

Kogarah City Council has constructed a stormwater harvesting plant in Carlton. Stormwater from Kogarah Bay Creek stormwater channel is treated and utilised at Council's works depot for irrigation, vehicle wash-down, street sweeping and other uses. The system may be expanded to supply local industry and irrigation systems within the area. This will reduce stormwater entering Kogarah Bay, improving water quality.

Kogarah City Council also continues to develop water sensitive urban design projects, including a greenroof on its customer service centre. This structure not only treats and reduces stormwater, but provides a green space and habitat for organisms within the urban environment.

Kogarah City Council has installed an array of GPTs to prevent litter, organic matter, sediment and oil from entering its waterways. This includes continuous deflective separation units around Oatley Bay, a trash rack at Oatley Pleasure Grounds, butt traps around Kogarah Town Centre and six litter traps in underground pits at the Oatley Shopping Centre. Council has also installed two litter traps specially designed for tidal channels at the Beverley Park stormwater channel and the Carrs Park stormwater channel. Once litter comes into contact with the device it is immediately trapped within a gate system. Council staff are then able to clean out the system regularly.

To maintain and improve water quality, in 2015–2016 Rockdale Council has undertaken: maintenance of floating reed beds in Bicentennial Ponds and aerators in Scarborough Ponds; 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; as well as dunal and estuarine vegetation restoration programs.

Hurstville City Council is currently designing their next stormwater quality improvement scheme at Upper Boggywell Creek, Gannons Park. It is proposed that the 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.

Designs have also been completed for Dairy Creek bank restoration works. The works will restore and stabilise 40 metres of stream bank through the installation of sandstone rocks and the planting of over 1000 indigenous plants. Over 200 wetland plants have also been planted in the downstream constructed wetland area. In addition to stabilising this section of stream bank, the project will help improve water quality by reducing sediment loads.

Hurstville City Council has also had the Georges River Riverkeeper and two Green Army teams working along creekline and foreshore areas of the Georges River. They have restored over 14.5 hectares of vegetation and removed over 10 tonnes of litter. One site along Salt Pan Creek resulted in the removal of over 2.3 tonnes of rubbish in three days from a 200m section of foreshore.

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. The levy also funds stormwater infrastructure maintenance. Council will be undertaking a water quality prioritisation study for the Bate Bay catchment. The purpose of the study is to investigate Council's treated and untreated catchments and recommend prioritised management actions to improve overall water quality in Bate Bay. Council has also developed management plans for ongoing maintenance of the dune system at Cronulla. The management plans will guide the placement and installation of dune fencing, weed control, erosion management, track maintenance and planting of the dunal system between North Cronulla Beach and Wanda.

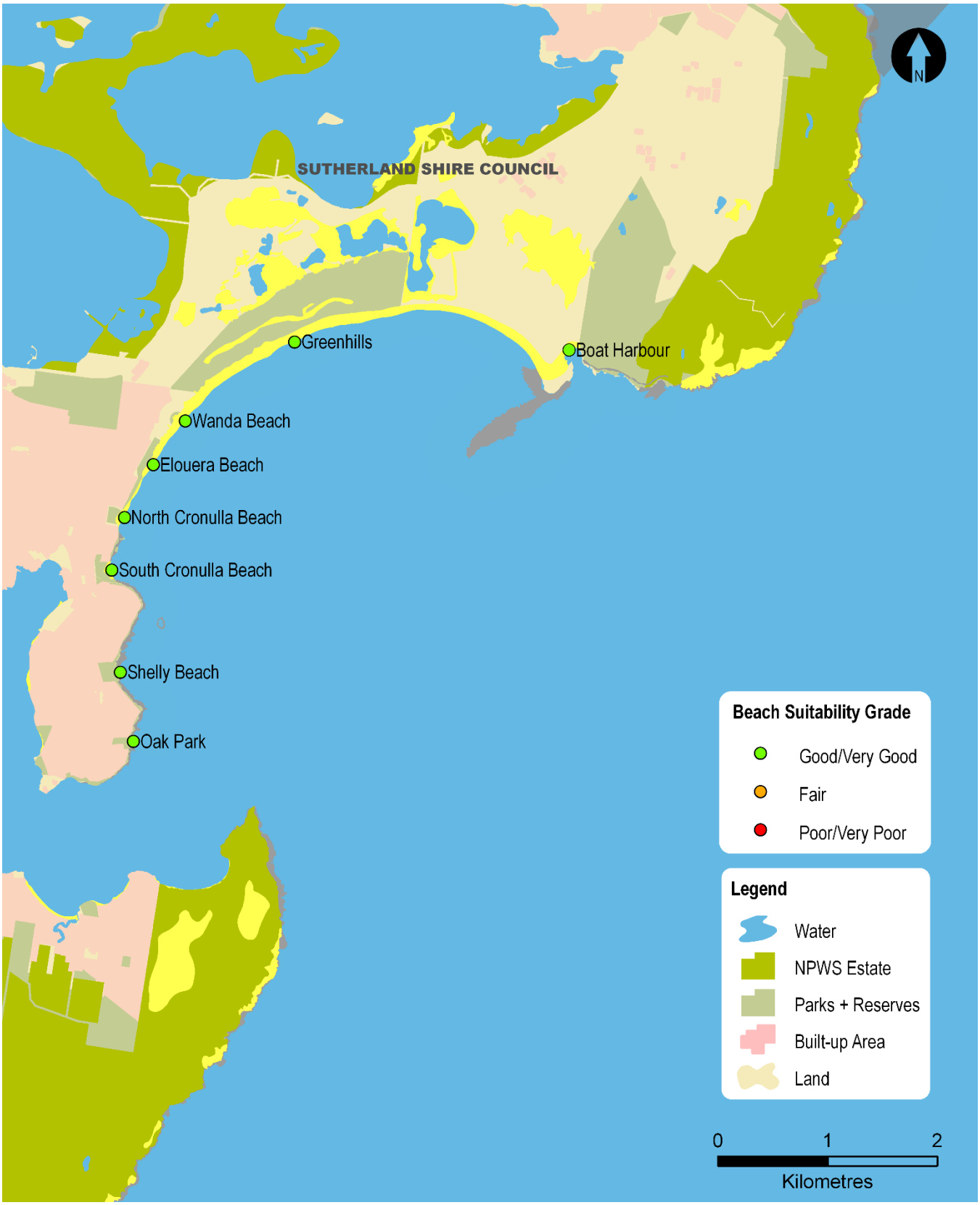
Port Hacking

There are 430 registered on-site 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.

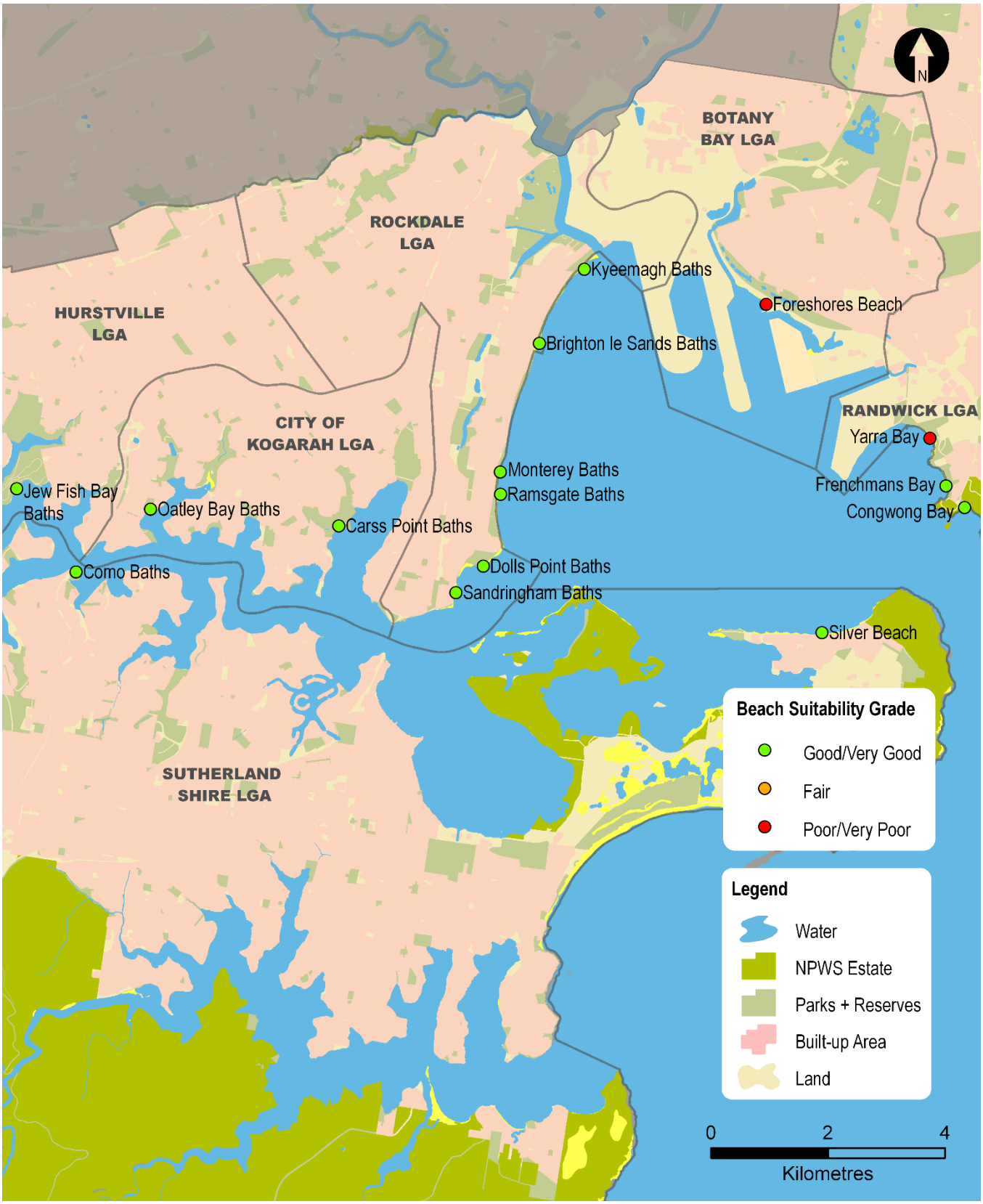
To reduce the incidence of wet weather sewage overflows in the catchments of Gunnamatta Bay Baths, Sydney Water has amplified pipes and pumps and included storage tanks across the Cronulla Peninsula.

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.

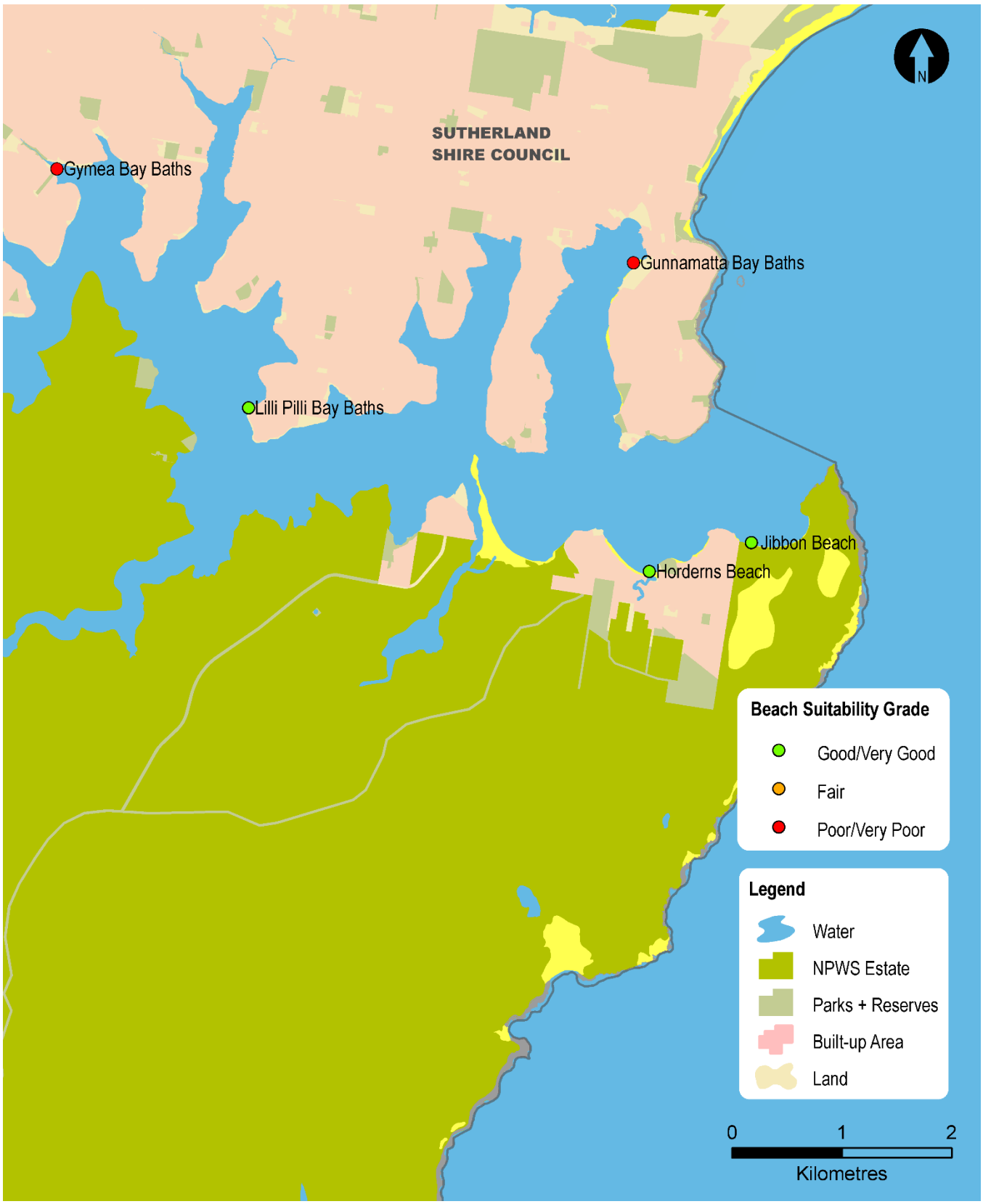
The Hacking River Stormwater Management Plan was developed by Wollongong and Sutherland councils and identifies and prioritises actions to improve stormwater quality and reduce flooding in the Port Hacking catchment.



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



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



Sampling locations and Beach Suitability Grades in Port Hacking

Boat Harbour

Beach Suitability Grade: G

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

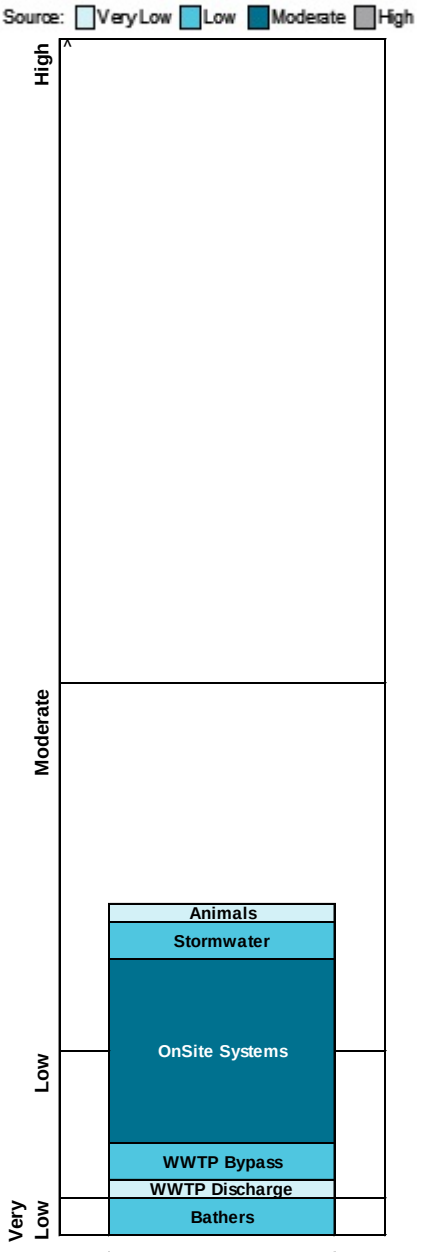
Boat Harbour is a narrow, 150 metre long private beach at the northern end of Bate Bay. It is the beach closest to the Cronulla Wastewater Treatment Plant (WWTP) outfall at Potter Point. Boat Harbour is not patrolled by lifeguards.

The Beach Suitability Grade of Good indicates that microbial water quality is suitable for swimming most of the time but the water may be susceptible to pollution from several potential sources of faecal contamination including stormwater and on-site sewer systems behind the beach.

The response to rainfall graph indicates that enterococci levels had little response to rainfall, occasionally exceeding the safe swimming limit across most rainfall categories.

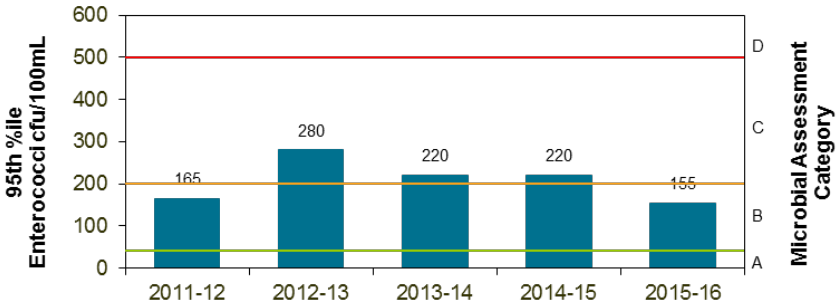
The site has been monitored since 1989. Microbial water quality improved in 2001–2002 following the upgrade of the Cronulla WWTP in April 2001. The creek at the northern end of the beach has been identified as the source of ongoing low levels of contamination in Boat Harbour. Further investigations were unable to identify if the source of contaminants is human or non-human.

Sanitary Inspection: **Moderate**



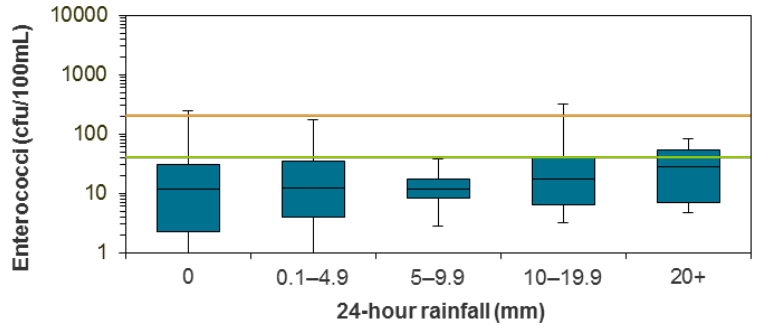
Microbial Assessment: **B**

Monitoring period for 2015–16 result is August 2014 to April 2016.

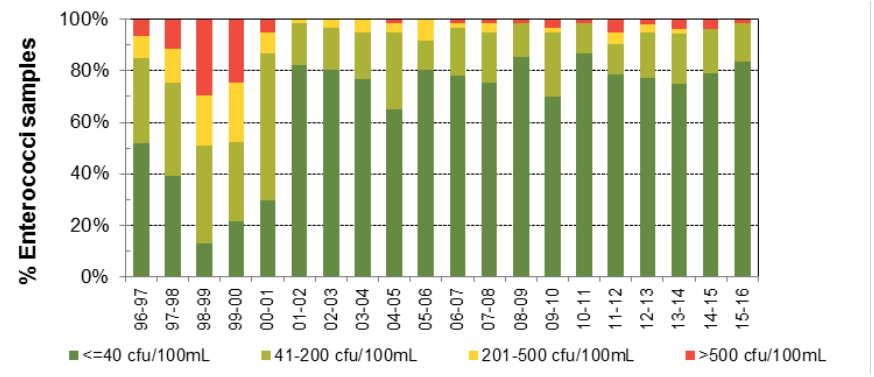


Response to rainfall

Rainfall from Cronulla STP rain gauge

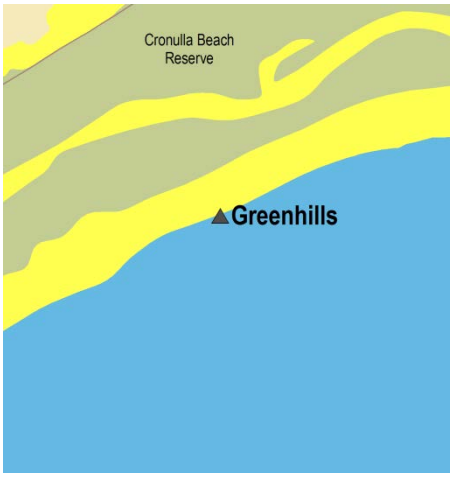


Trends in enterococci data through time



Greenhills Beach

Beach Suitability Grade: VG



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

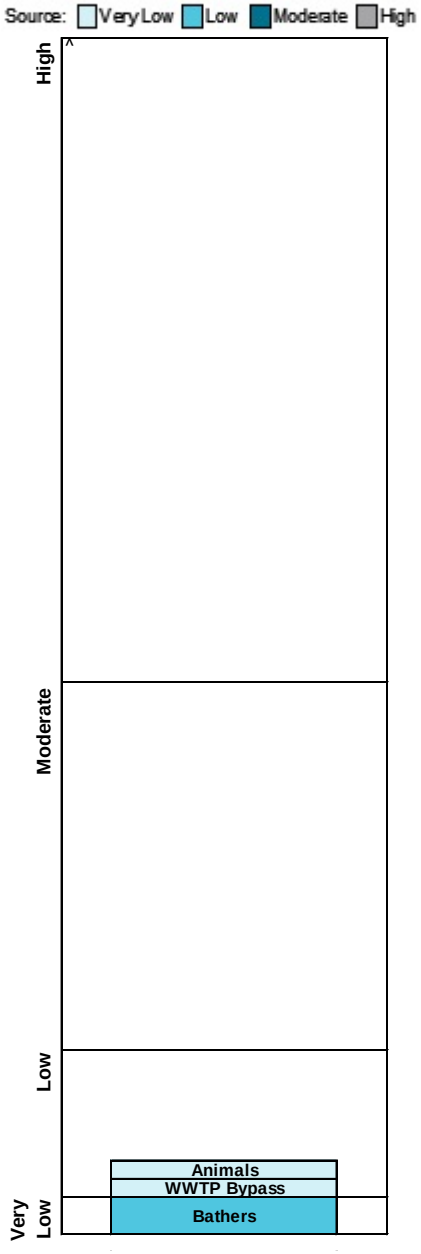
Greenhills Beach is three kilometres long and situated at the northern end of Bate Bay. Merries Reef protects the beach at the north end from the larger waves and rips common at the southern end. The beach is not patrolled.

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

The response to rainfall graph indicates that enterococci levels generally increased with increasing rainfall, occasionally exceeding the safe swimming limit after 20mm or more of rainfall.

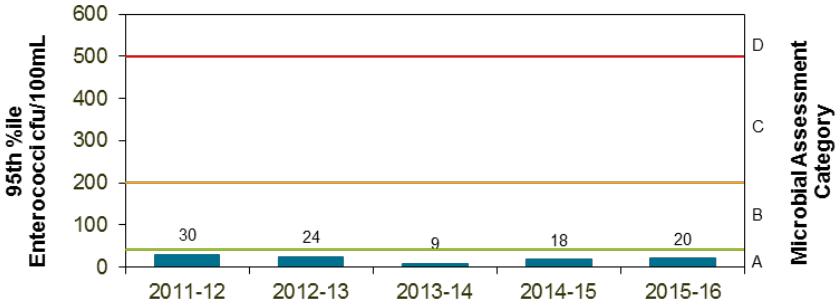
The site has been monitored since 1989. Microbial water quality improved in 2001–2002 following the upgrade of the Cronulla WWTP in April 2001. Since then, small variations between years have been due to rainfall patterns.

Sanitary Inspection: **Low**



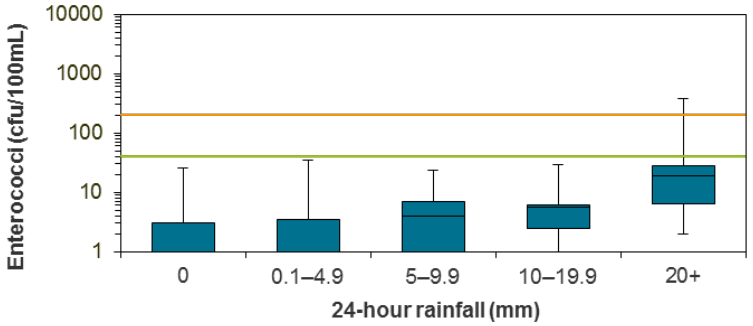
Microbial Assessment: **A**

Monitoring period for 2015–16 result is August 2014 to April 2016.

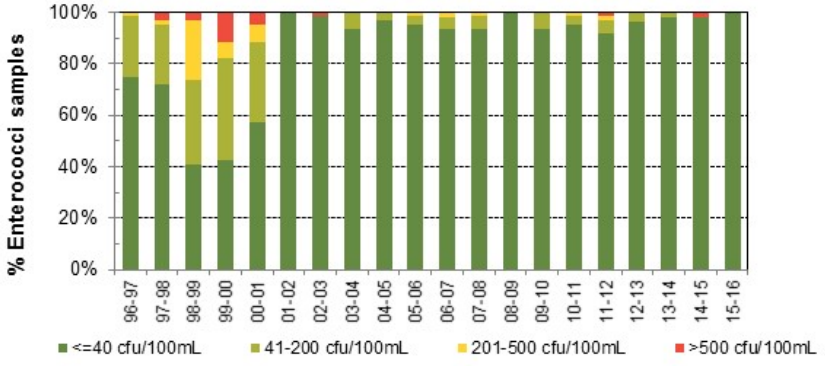


Response to rainfall

Rainfall from Cronulla STP rain gauge



Trends in enterococci data through time



Wanda Beach

Beach Suitability Grade: VG

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

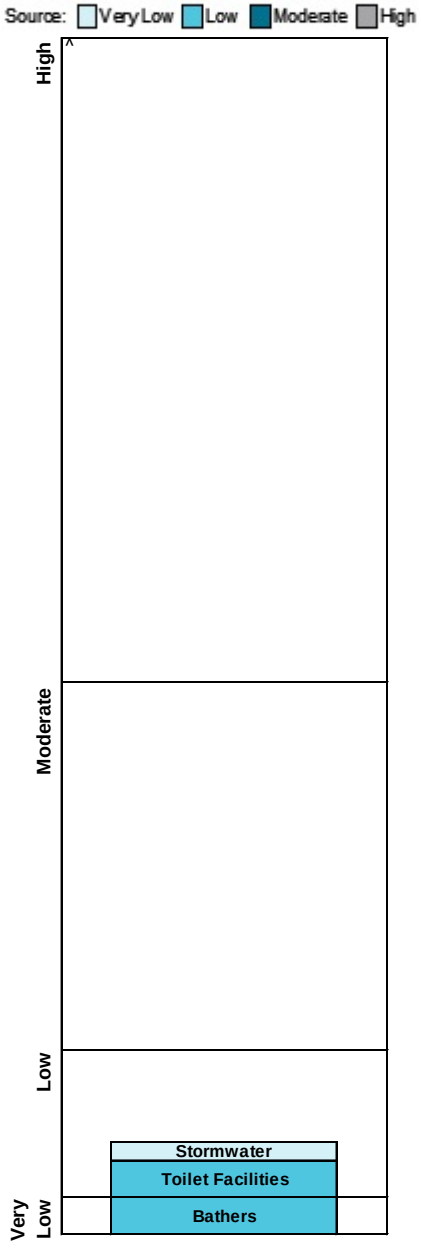
Wanda, Elouera and North Cronulla beaches form a 1.5 kilometre stretch of beach towards the southern end of Bate Bay. Swimming can be hazardous, with numerous rips. Lifeguards patrol from October to April.

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

The response to rainfall graph indicates that enterococci levels generally increased with increasing rainfall, often exceeding the safe swimming limit in response to 20mm or more of rainfall.

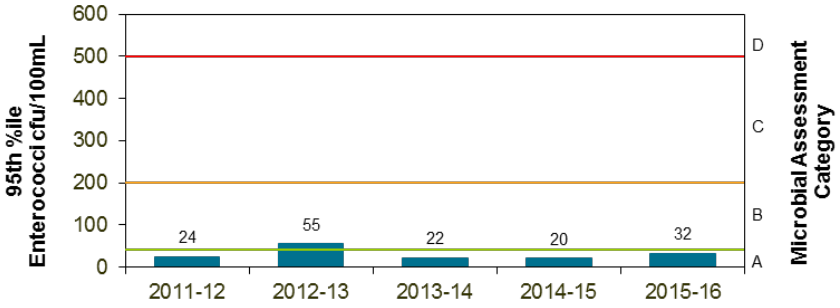
The site has been monitored since 1989. Microbial water quality improved in 2001–2002 following the upgrade of the Cronulla WWTP in April 2001.

Sanitary Inspection: **Low**



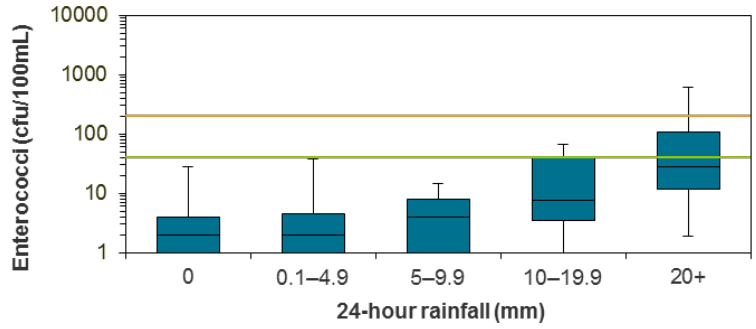
Microbial Assessment: **A**

Monitoring period for 2015–16 result is August 2014 to April 2016.

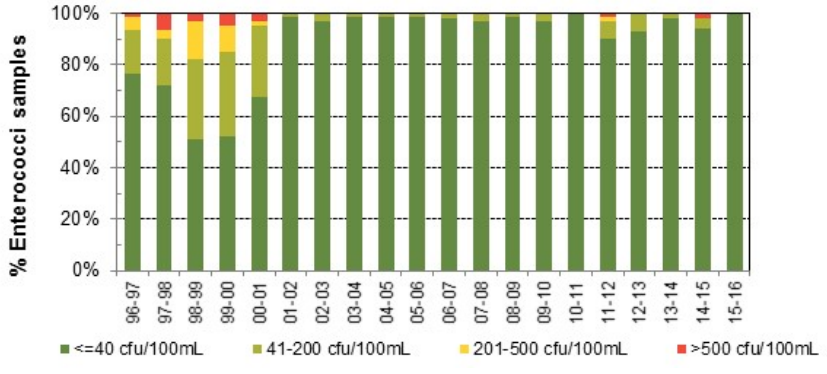


Response to rainfall

Rainfall from Cronulla STP rain gauge



Trends in enterococci data through time



Elouera Beach

Beach Suitability Grade: VG

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

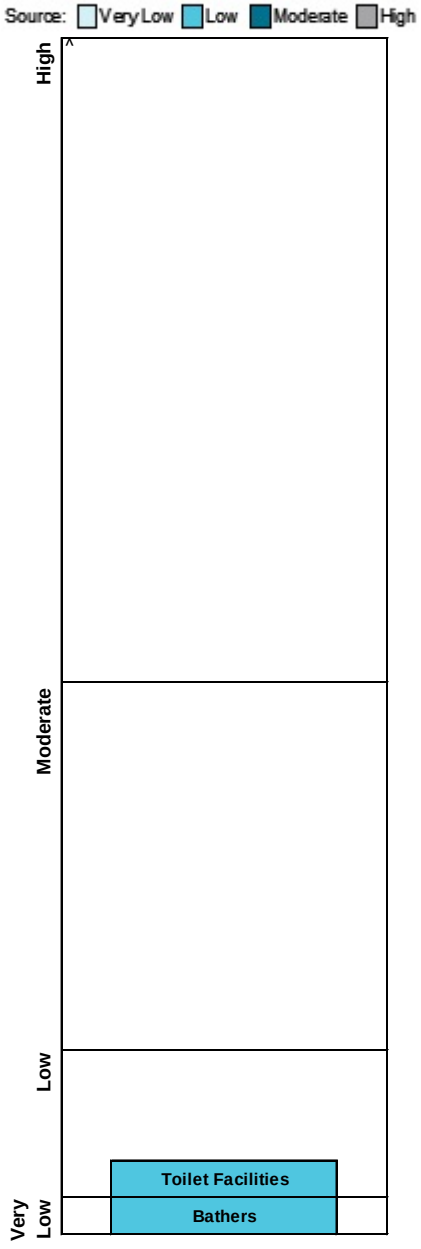
Wanda, Elouera and North Cronulla beaches form a 1.5 kilometre stretch of beach towards the southern end of Bate Bay. Swimming can be hazardous, with numerous rips, and lifeguards patrol the beach from October to April.

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

The response to rainfall graph indicates that enterococci levels generally increased with increasing rainfall, regularly exceeding the safe swimming limit in response to 20mm or more of rainfall.

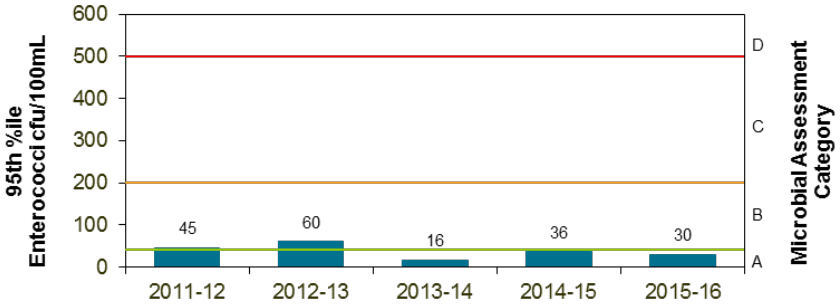
The site has been monitored since 1989. Microbial water quality improved in 2001–2002 following the upgrade of the Cronulla WWTP in April 2001.

Sanitary Inspection: **Low**



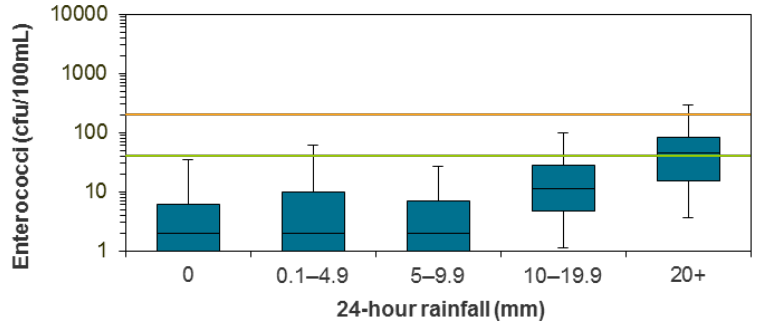
Microbial Assessment: **A**

Monitoring period for 2015–16 result is August 2014 to April 2016.

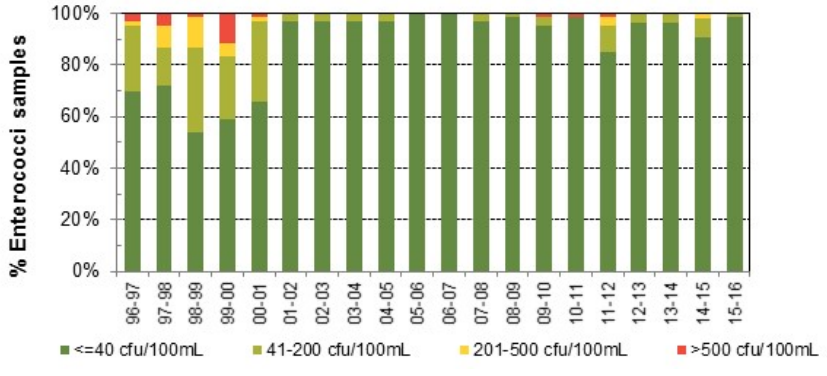


Response to rainfall

Rainfall from Cronulla STP rain gauge



Trends in enterococci data through time



North Cronulla Beach

Beach Suitability Grade: VG

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

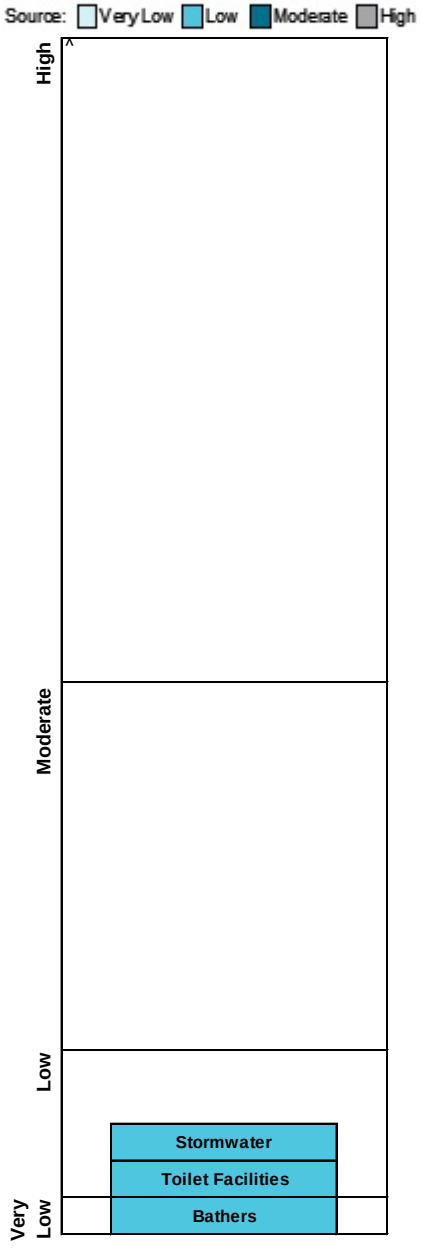
North Cronulla Beach is at the southern end of a 1.5 kilometre stretch of beach in Bate Bay. Swimming can be hazardous, with numerous rips. Lifeguards patrol the beach all year round.

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

The response to rainfall graph indicates that enterococci levels increased slightly with increasing rainfall, frequently exceeding the safe swimming limit in response to 20mm or more of rainfall.

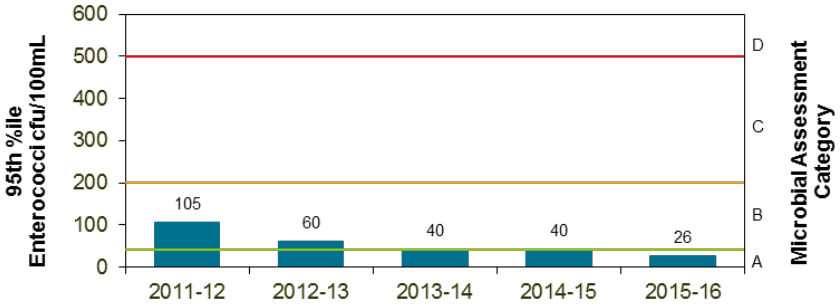
The site has been monitored since 1989. Microbial water quality improved in 2001–2002 following the upgrade of the Cronulla WWTP in April 2001.

Sanitary Inspection: **Low**



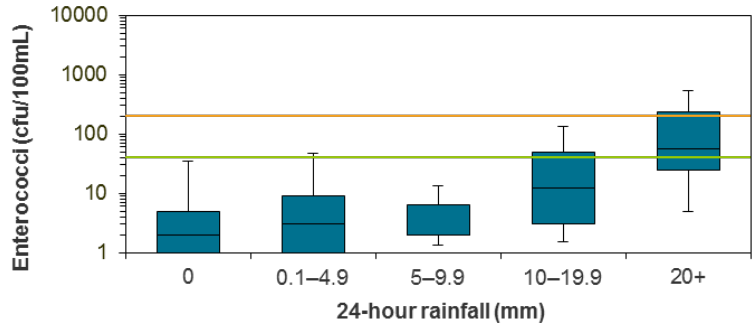
Microbial Assessment: **A**

Monitoring period for 2015–16 result is August 2014 to April 2016.

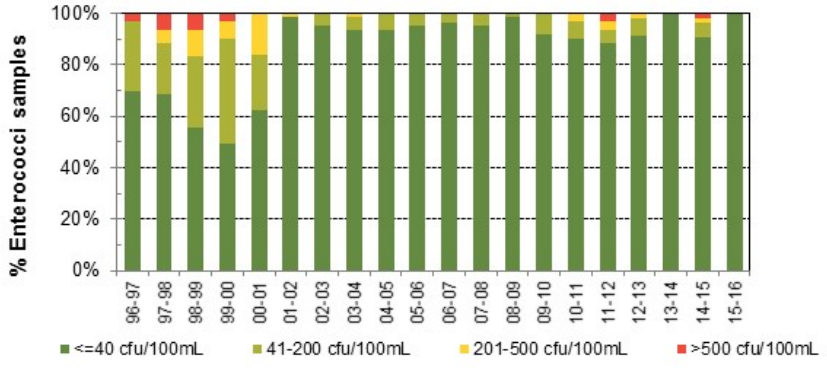


Response to rainfall

Rainfall from Cronulla STP rain gauge



Trends in enterococci data through time



South Cronulla Beach

Beach Suitability Grade: G

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

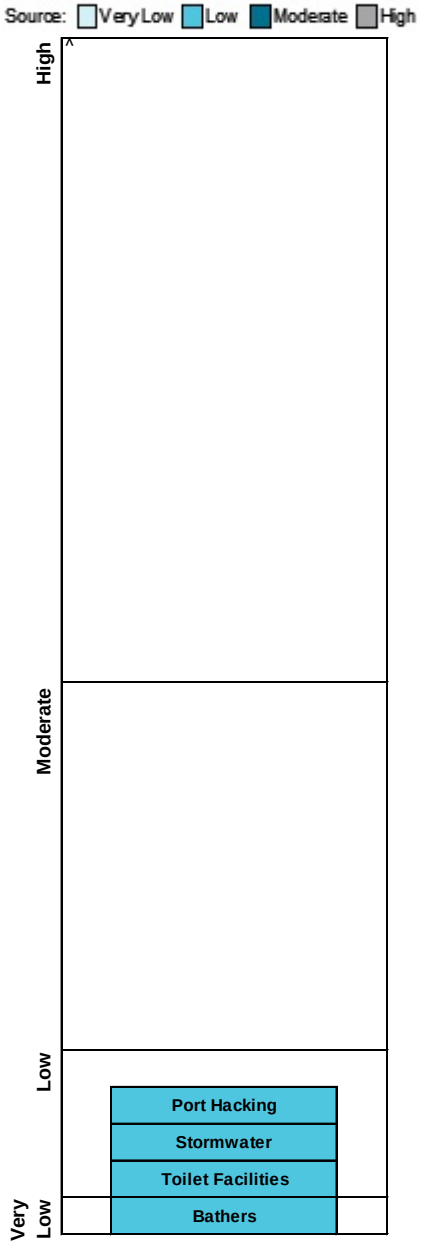
South Cronulla beach is 300 metres long and situated at the southern end of Bate Bay. Swimming is relatively safe, but rips occasionally form at either end of the beach. Lifeguards patrol the beach all year round.

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

The response to rainfall graph indicates that enterococci levels increased slightly with increasing rainfall, regularly exceeding the safe swimming limit in response to 10mm or more of rainfall.

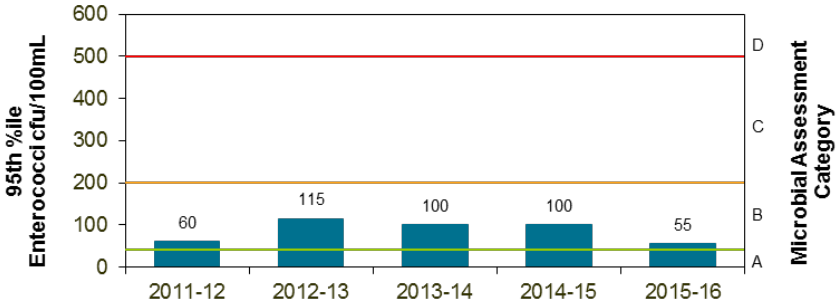
The site has been monitored since 1989. Microbial water quality improved in 2001–2002 following the upgrade of the Cronulla WWTP in April 2001. Since then, small variations among years have been the result of rainfall.

Sanitary Inspection: **Low**



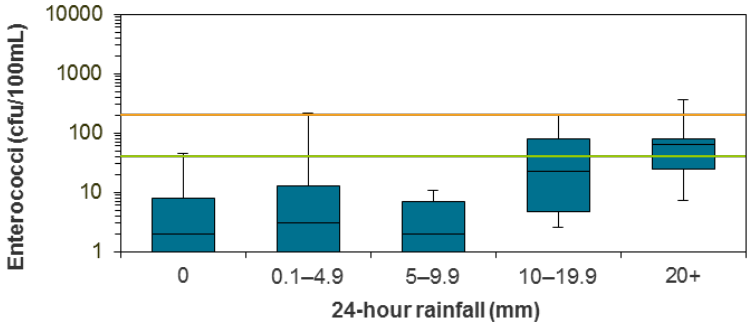
Microbial Assessment: **B**

Monitoring period for 2015–16 result is August 2014 to April 2016.

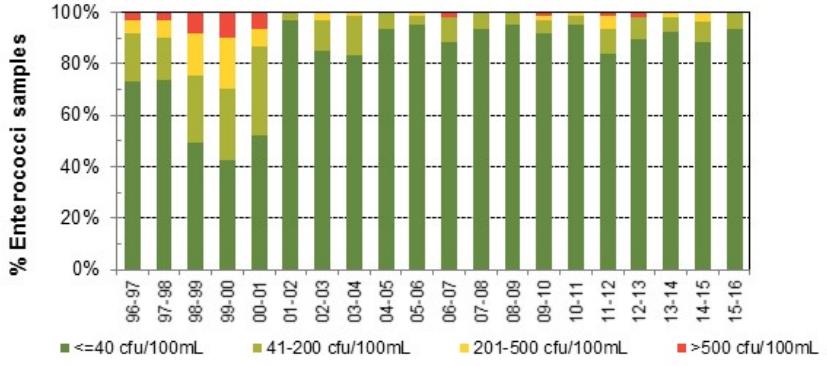


Response to rainfall

Rainfall from Cronulla STP rain gauge



Trends in enterococci data through time



Shelly Beach

Beach Suitability Grade: VG

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

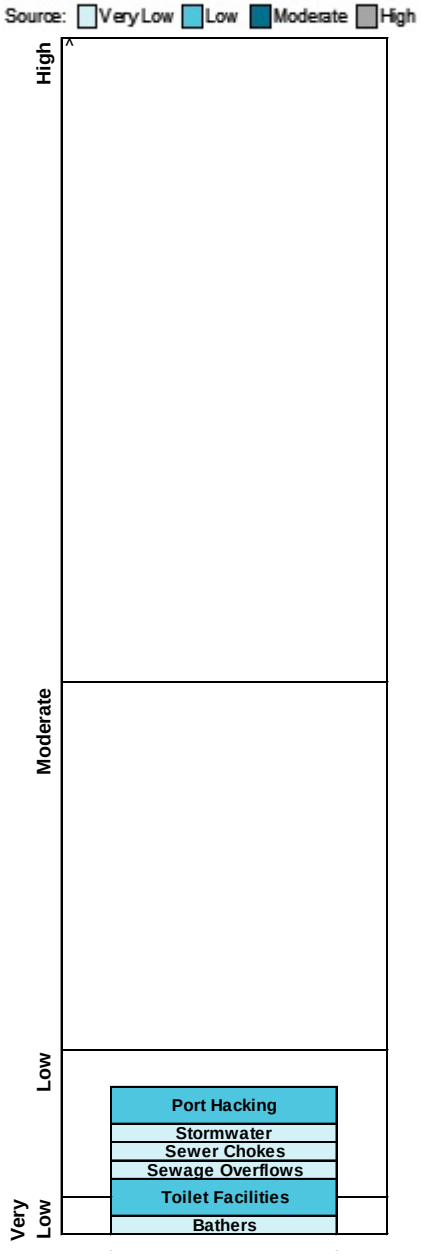
Shelly beach is 50 metres long and backed by a foreshore walk and a large park and picnic area. The adjacent ocean pool is the most suitable area for swimming. Lifeguards do not patrol the swimming area.

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

The response to rainfall graph indicates that enterococci levels increased with increasing rainfall, frequently exceeding the safe swimming limit after 20mm or more of rainfall.

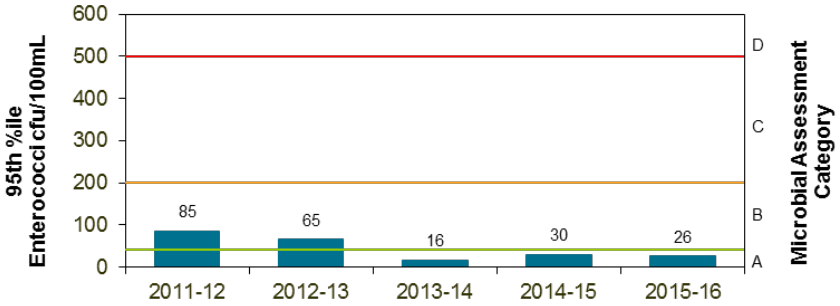
The site has been monitored since 1989. Microbial water quality improved in 2001–2002 following the upgrade of the Cronulla WWTP in April 2001. Since then, small variations among years have been the result of rainfall.

Sanitary Inspection: **Low**



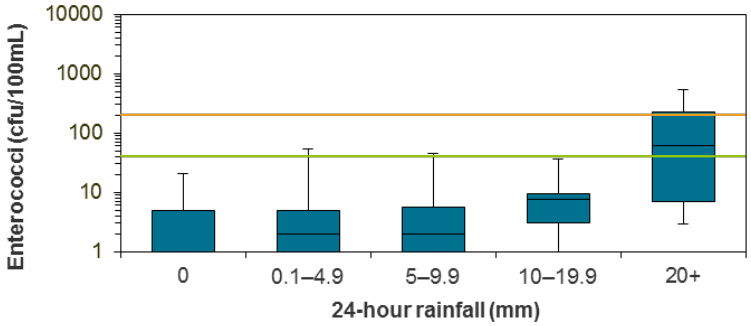
Microbial Assessment: **A**

Monitoring period for 2015–16 result is August 2014 to April 2016.

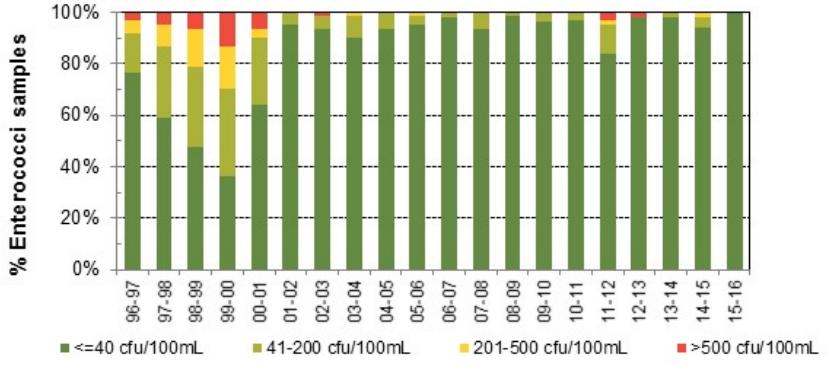


Response to rainfall

Rainfall from Cronulla STP rain gauge



Trends in enterococci data through time



Oak Park

Beach Suitability Grade: VG

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

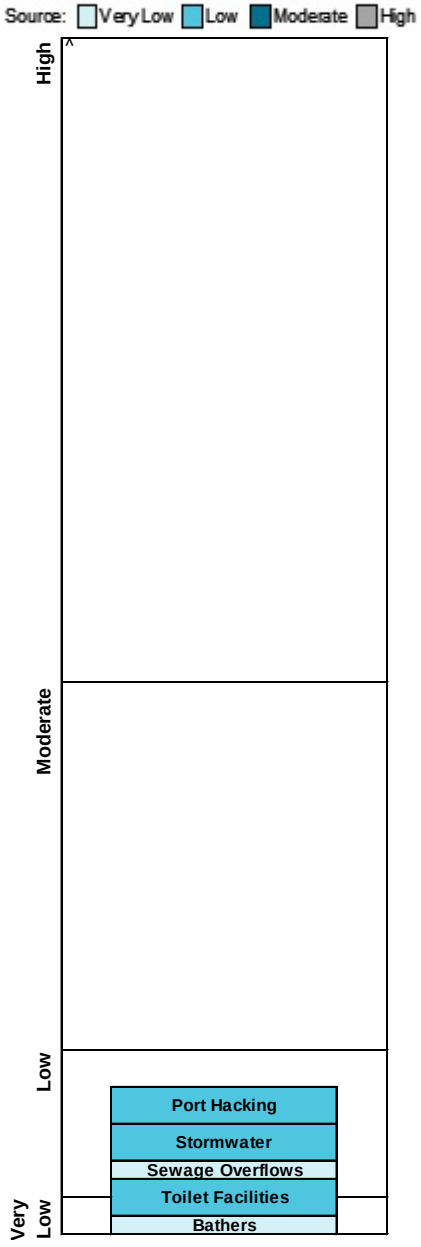
Oak Park beach is 15 metres long, with the most suitable area for swimming adjacent to the ocean pool. The beach is backed by a park and picnic area. Lifeguards do not patrol the swimming area.

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

The response to rainfall graph indicates that enterococci levels increased slightly with increasing rainfall, regularly exceeding the safe swimming limit in response to 20mm or more of rainfall.

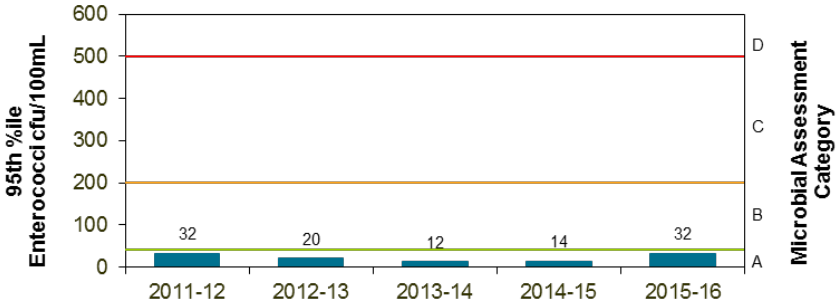
The site has been monitored since 1989. Microbial water quality improved in 2001–2002 following the upgrade of the Cronulla WWTP in April 2001. Since then, small variations among years have been the result of rainfall.

Sanitary Inspection: **Low**



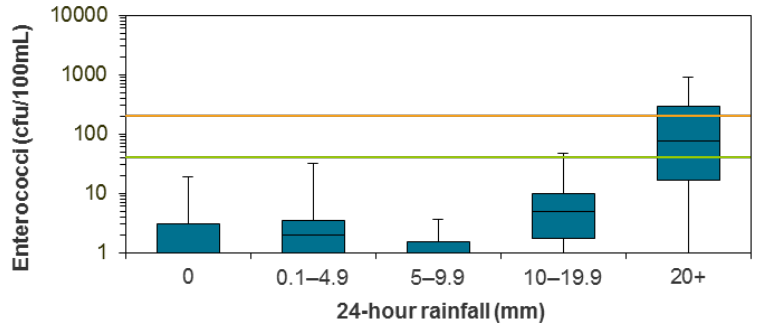
Microbial Assessment: **A**

Monitoring period for 2015–16 result is August 2014 to April 2016.

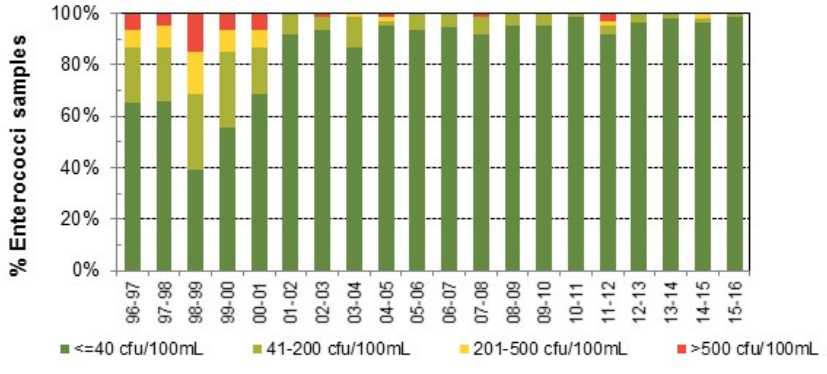


Response to rainfall

Rainfall from Cronulla STP rain gauge



Trends in enterococci data through time



Silver Beach

Beach Suitability Grade: G

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

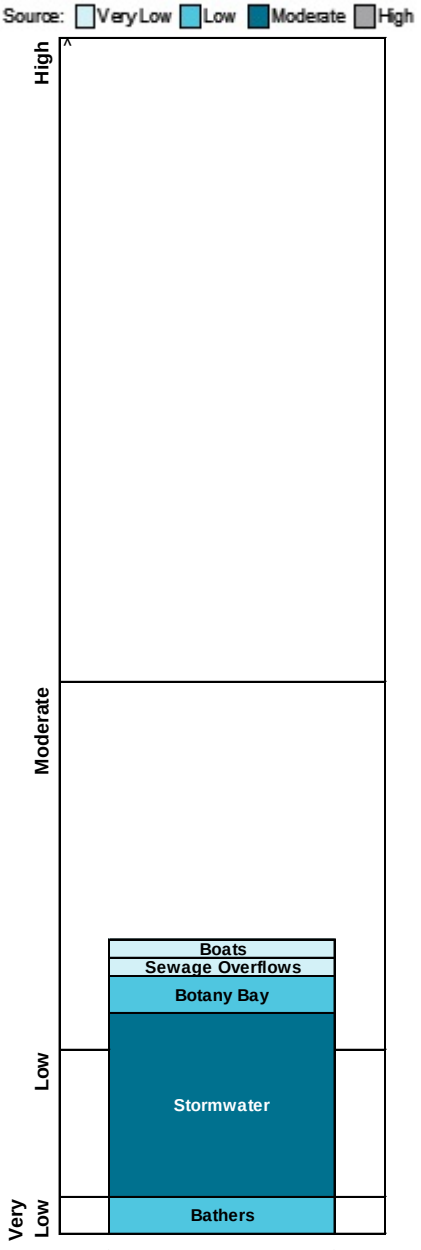
Silver Beach is approximately 2.8 kilometres long and is on the southern shore of Botany Bay. The netted swimming area is 150 by 100 metres and is near the centre of the beach.

The Beach Suitability Grade of Good indicates that microbial water quality is suitable for swimming most of the time but the water may be susceptible to pollution from a number of potential sources of faecal contamination including stormwater.

The response to rainfall graph indicates that enterococci levels generally increased with increasing rainfall, sometimes exceeding the safe swimming limit after 10mm of rainfall or more, and occasionally after light rainfall.

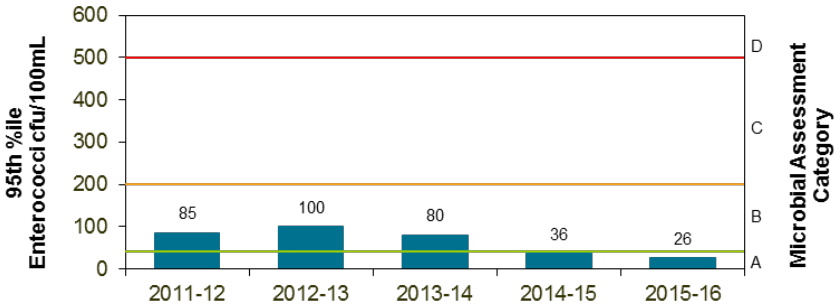
The site has been monitored since 1994. Microbial water quality has varied among years owing to variations in rainfall.

Sanitary Inspection: **Moderate**



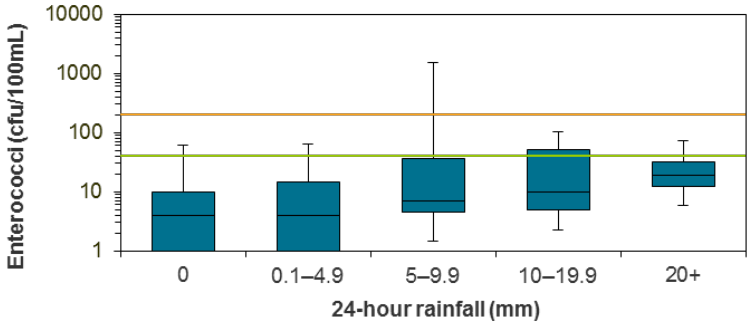
Microbial Assessment: **A**

Monitoring period for 2015–16 result is December 2013 to April 2016.

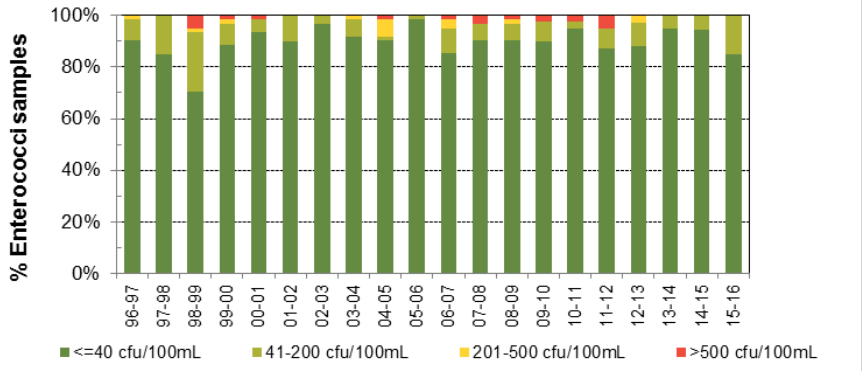


Response to rainfall

Rainfall from Malabar WWTP rain gauge

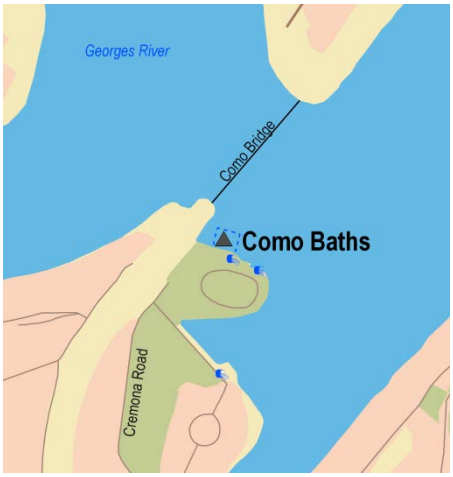


Trends in enterococci data through time



Como Baths

Beach Suitability Grade: G



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

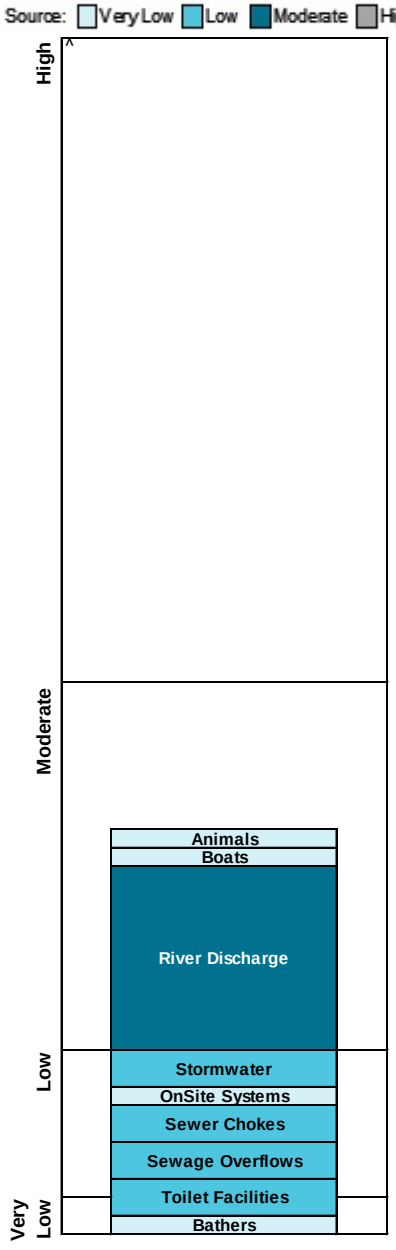
Como Baths are approximately 25 metres wide and backed by a narrow sandy beach in the lower Georges River. Adjacent to the baths is Como Pleasure Grounds, a heritage-listed park established in the 1880s.

The Beach Suitability Grade of Good indicates that the water quality is safe for swimming most of the time but can be susceptible to pollution after heavy rain, with potential faecal contamination from sources upstream in the Georges River.

The response to rainfall graph indicates that enterococci levels increased with increasing rainfall, regularly exceeding the safe swimming limit in response to 10mm of rainfall or more.

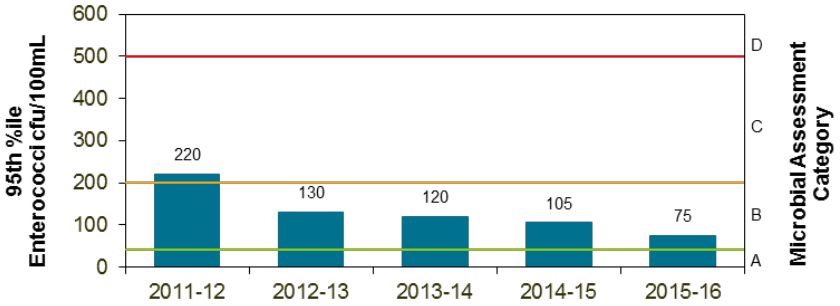
The site has been monitored since 1994. Microbial water quality has varied among years owing to variations in rainfall.

Sanitary Inspection: **Moderate**



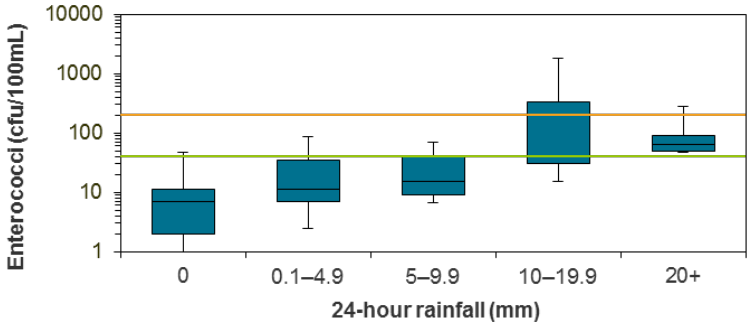
Microbial Assessment: **B**

Monitoring period for 2015–16 result is December 2013 to April 2016.

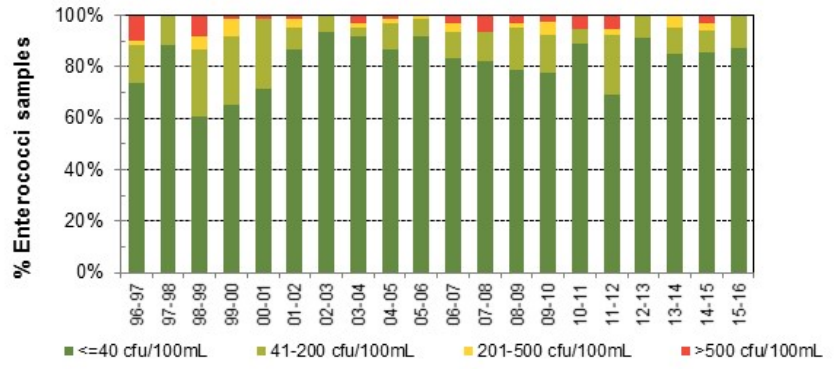


Response to rainfall

Rainfall from Kyle Bay rain gauge

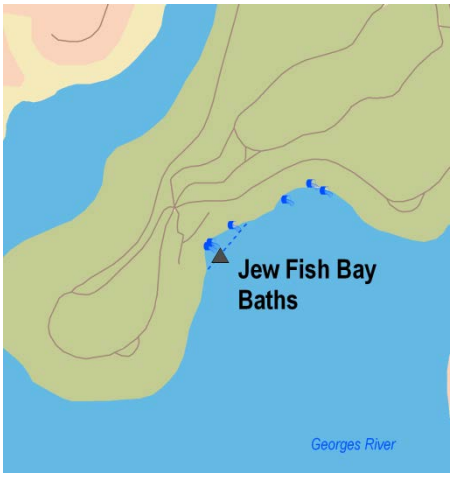


Trends in enterococci data through time



Jew Fish Bay Baths

Beach Suitability Grade: G



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

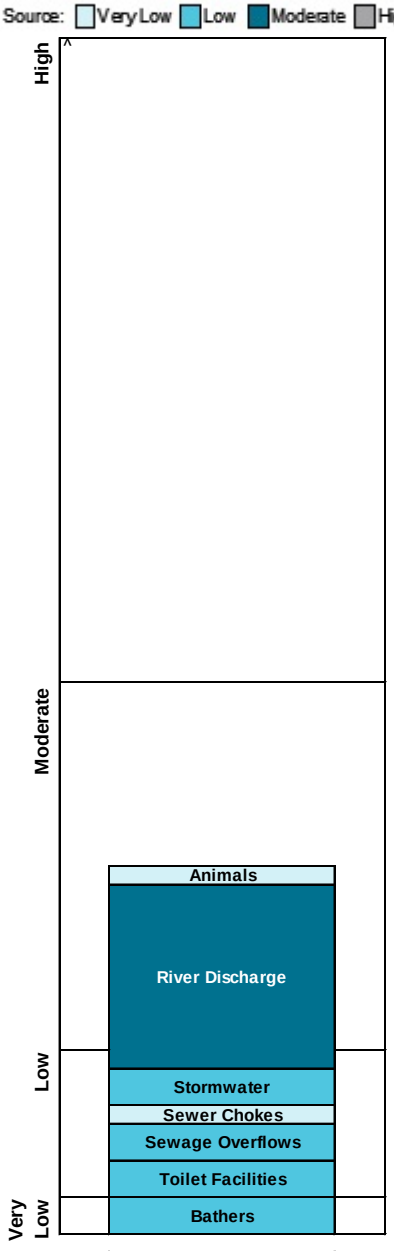
The baths are a 200 metre long netted swimming area located in Jew Fish Bay in the lower Georges River. The swimming area is backed by a narrow sandy beach and the extensive bushland of Oatley Park.

The Beach Suitability Grade of Good indicates that microbial water quality is suitable for swimming most of the time but the water may be susceptible to pollution from a number of potential sources of faecal contamination including discharge from the Georges River.

The response to rainfall graph indicates that enterococci levels increased with increasing rainfall, regularly exceeding the safe swimming limit in response to 10mm of rainfall or more.

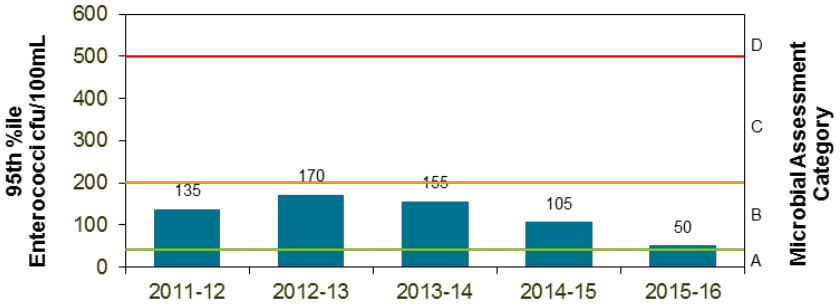
The site has been monitored since 1994. Microbial water quality has varied among years owing to variations in rainfall.

Sanitary Inspection: **Moderate**



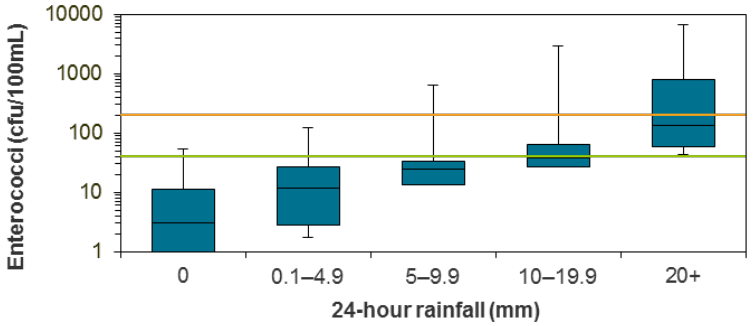
Microbial Assessment: **B**

Monitoring period for 2015–16 result is December 2013 to April 2016.

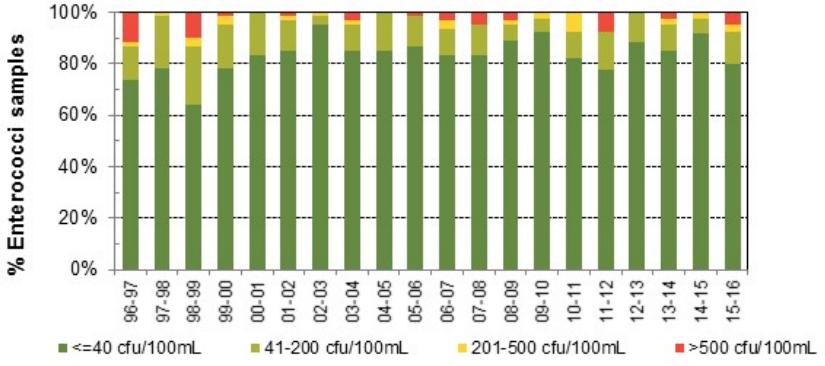


Response to rainfall

Rainfall from Kyle Bay rain gauge



Trends in enterococci data through time



Oatley Bay Baths

Beach Suitability Grade: G

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

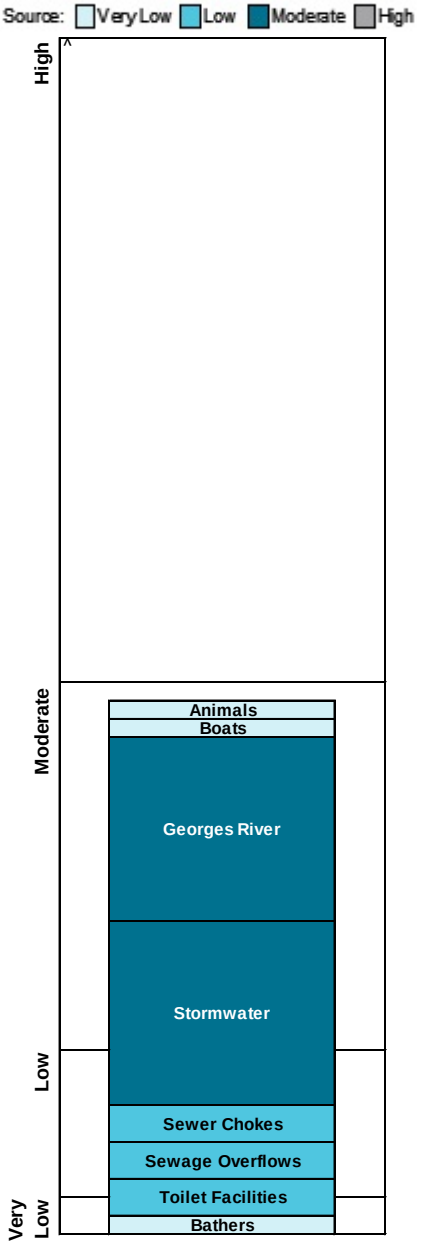
Oatley Bay Baths are located on the western shore of Oatley Bay in the lower Georges River. The netted swimming area is approximately 50 metres long and backed by a small beach and Oatley Pleasure Grounds.

The Beach Suitability Grade of Good indicates that microbial water quality is suitable for swimming most of the time but the water may be susceptible to pollution from a number of potential sources of faecal contamination including discharge from the Georges River.

The response to rainfall graph indicates that enterococci levels increased with increasing rainfall, regularly exceeding the safe swimming limit after 5mm of rainfall or more.

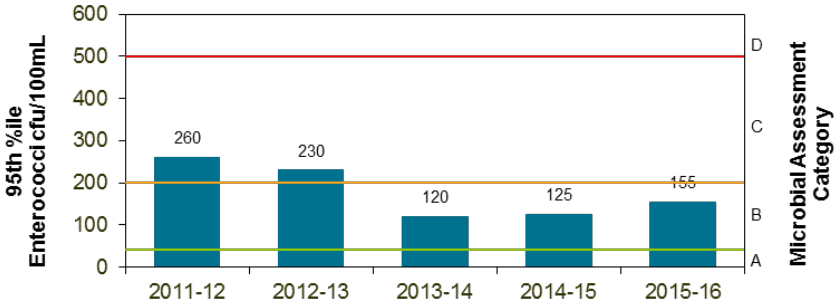
The site has been monitored since 1994. Microbial water quality has varied among years owing to variations in rainfall.

Sanitary Inspection: **Moderate**



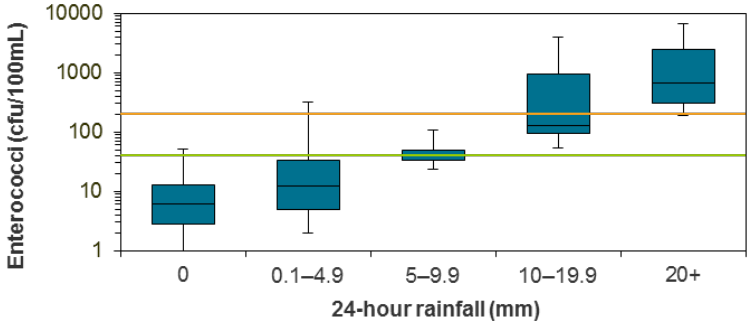
Microbial Assessment: **B**

Monitoring period for 2015–16 result is December 2013 to April 2016.

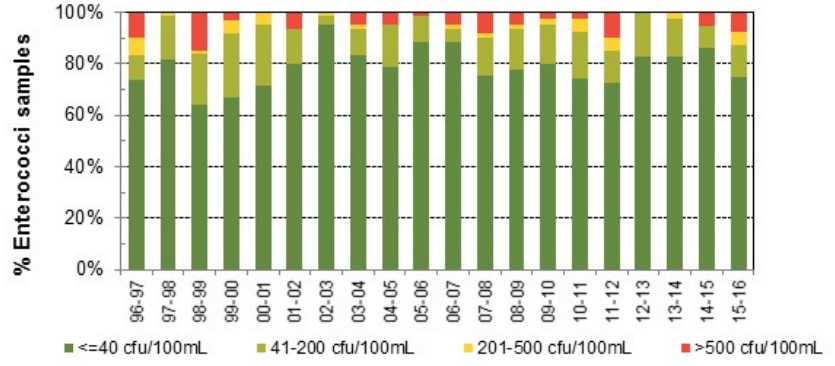


Response to rainfall

Rainfall from Kyle Bay rain gauge

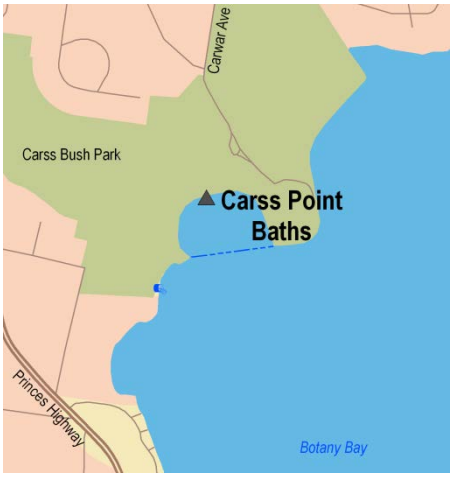


Trends in enterococci data through time



Carss Point Baths

Beach Suitability Grade: G



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

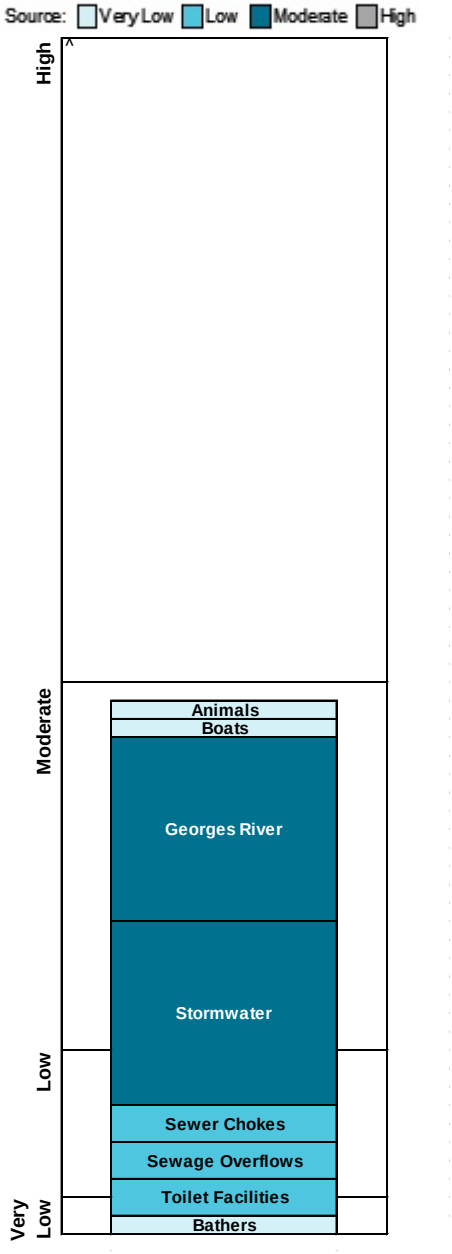
Carss Point Baths are a 100 by 60 metre netted swimming enclosure on the western shore of Kogarah Bay in the lower Georges River. The swimming area is backed by a narrow beach and Carss Bush Park.

The Beach Suitability Grade of Good indicates that microbial water quality is suitable for swimming most of the time but the water may be susceptible to pollution from a number of potential sources of faecal contamination including stormwater, sewer chokes and sources upstream in the Georges River.

The response to rainfall graph indicates that enterococci levels increased with increasing rainfall, often exceeding the safe swimming limit in response to light rainfall and regularly after 5mm of rain or more.

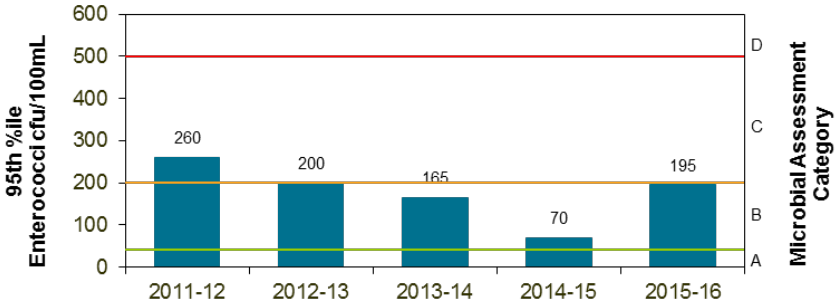
The site has been monitored since 1994. Microbial water quality has varied considerably among years with variations in rainfall.

Sanitary Inspection: **Moderate**



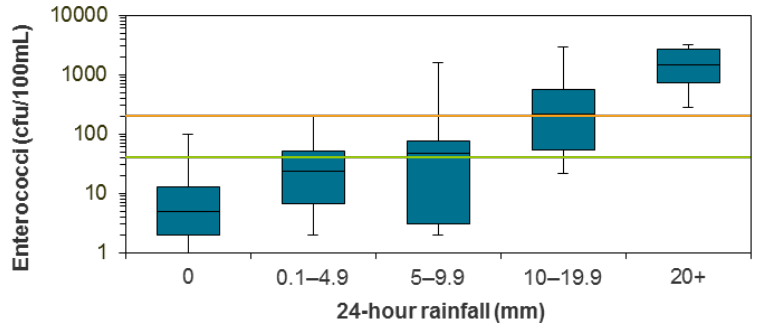
Microbial Assessment: **B**

Monitoring period for 2015–16 result is December 2013 to April 2016.

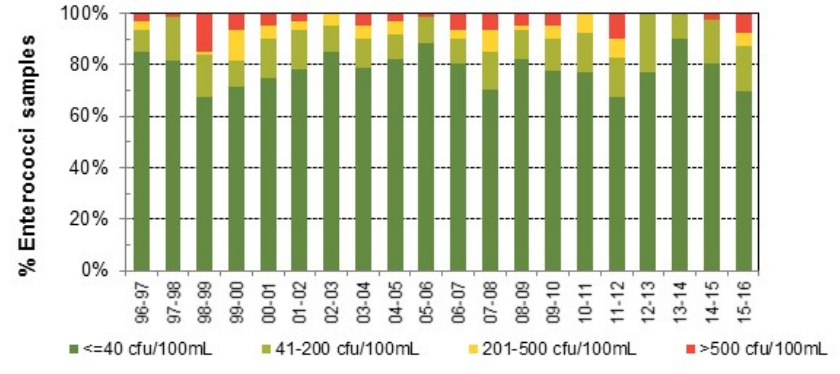


Response to rainfall

Rainfall from Kyle Bay rain gauge



Trends in enterococci data through time



Sandringham Baths

Beach Suitability Grade: G

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

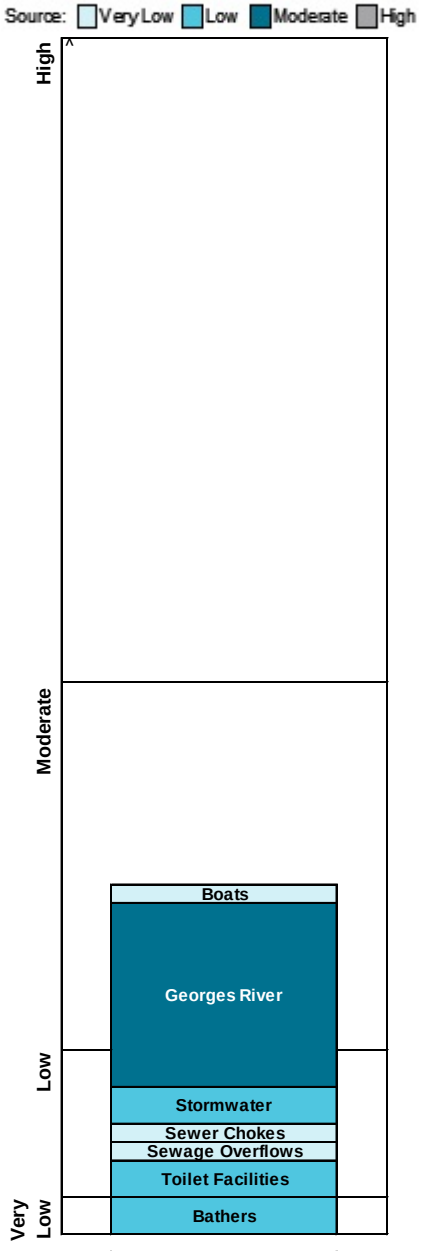
Sandringham Baths are a 30 by 40 metre netted swimming area near the mouth of the Georges River, backed by a small beach and walking track.

The Beach Suitability Grade of Good indicates that microbial water quality is suitable for swimming most of the time but the water may be susceptible to pollution following heavy rain, with potential faecal contamination from river discharge.

The response to rainfall graph indicates that enterococci levels generally increased with increasing rainfall, often exceeding the safe swimming limit in response to 10mm of rain or more.

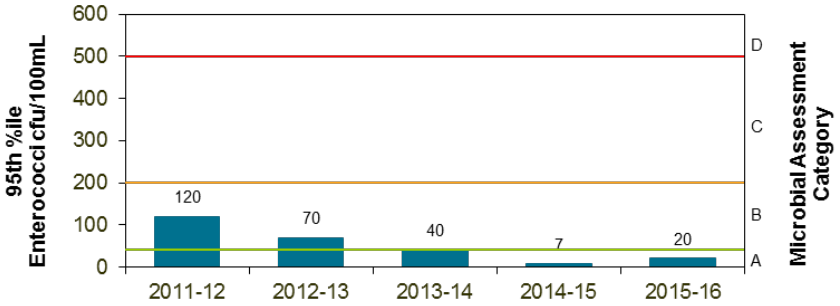
The site has been monitored since 1994. Microbial water quality has varied between years owing to variations in rainfall.

Sanitary Inspection: **Moderate**



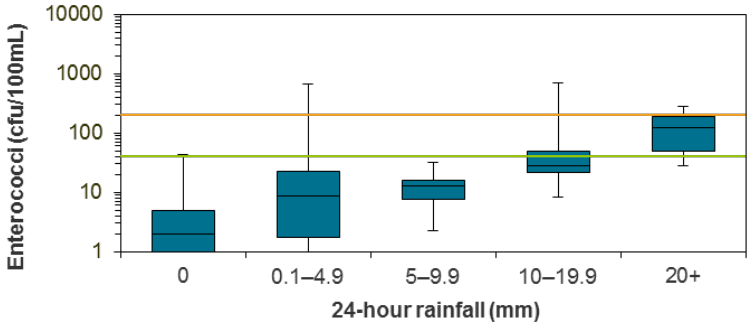
Microbial Assessment: **A**

Monitoring period for 2015–16 result is December 2013 to April 2016.

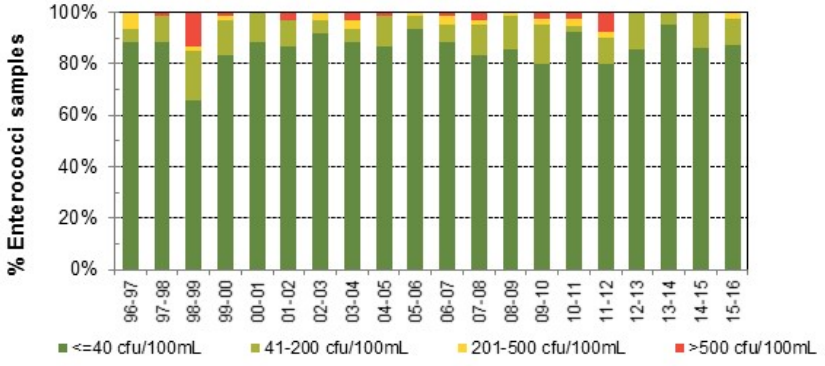


Response to rainfall

Rainfall from Kyeemagh rain gauge



Trends in enterococci data through time



Dolls Point Baths

Beach Suitability Grade: G

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

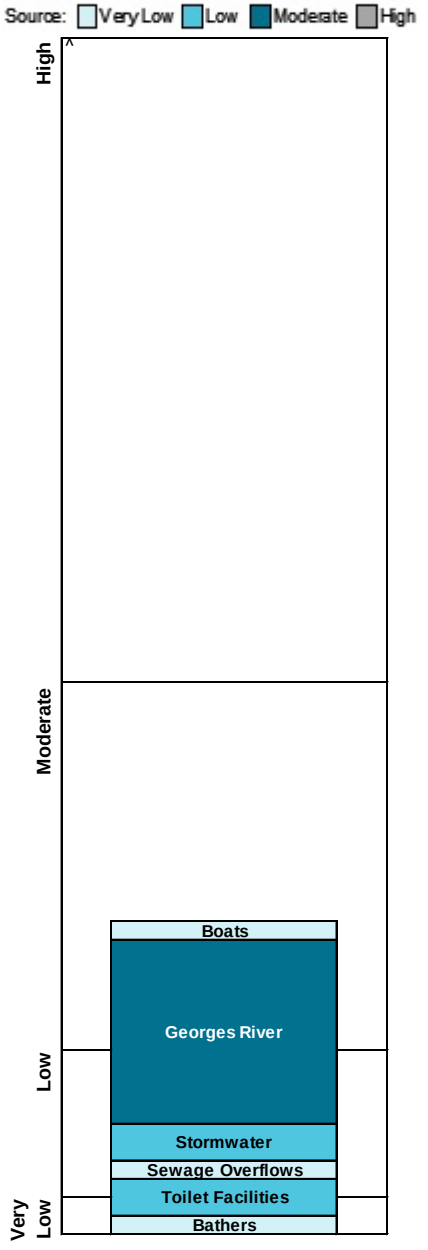
Dolls Point Baths are a 50 by 30 metre netted swimming area at the southern end of Lady Robinsons Beach in Botany Bay. The baths are backed by a sandy beach and park with barbecue and picnic facilities.

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

The response to rainfall graph indicates that enterococci levels increased with increasing rainfall, frequently exceeding the safe swimming limit in response to 10mm of rainfall or more.

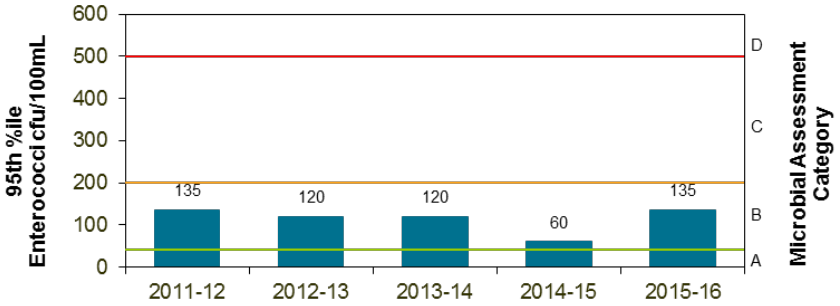
The site has been monitored since 1994. Microbial water quality has varied among years owing to variations in rainfall.

Sanitary Inspection: **Moderate**



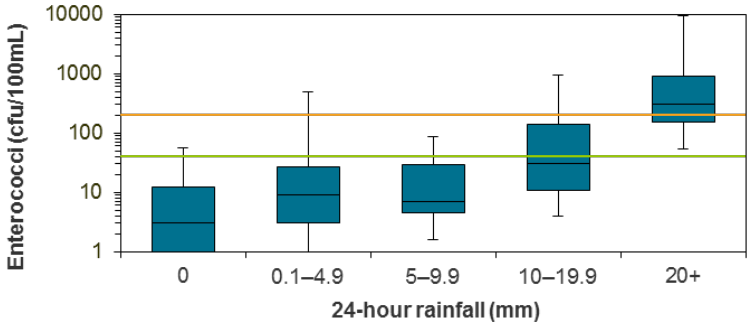
Microbial Assessment: **B**

Monitoring period for 2015–16 result is December 2013 to April 2016.

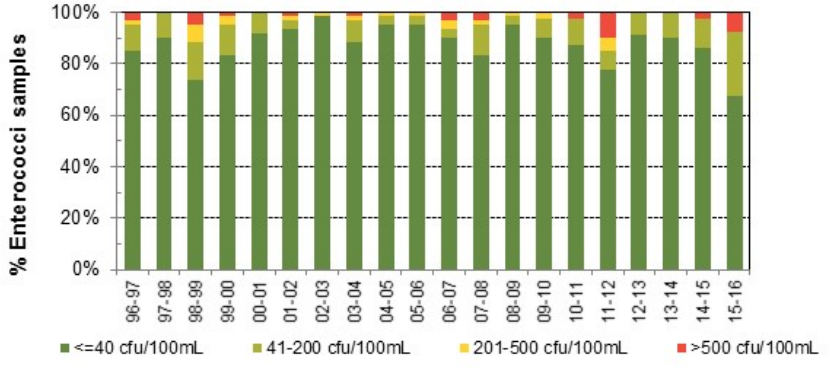


Response to rainfall

Rainfall from Kyeemagh rain gauge



Trends in enterococci data through time



Ramsgate Baths

Beach Suitability Grade: G

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

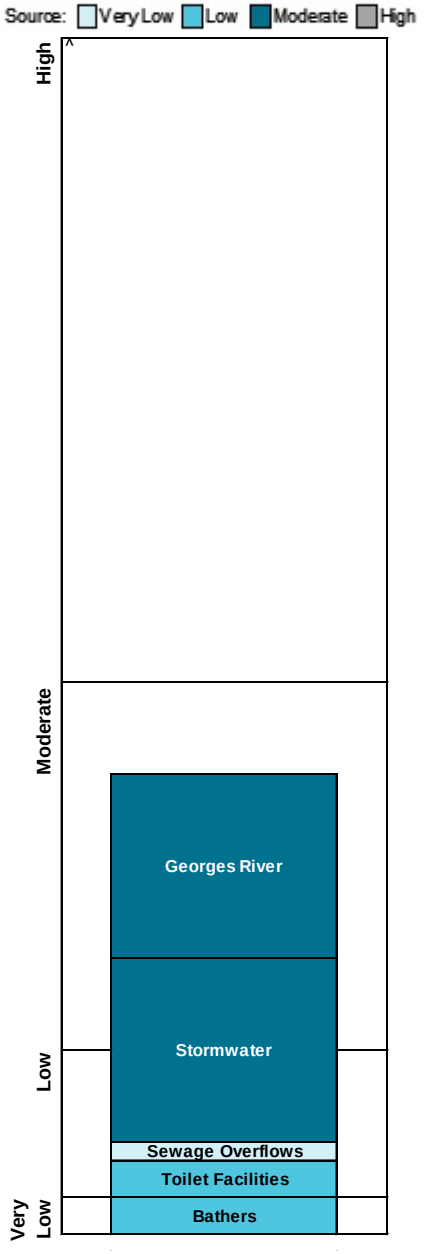
Ramsgate Baths are a 50 metre square swimming enclosure near the southern end of Lady Robinsons Beach in Botany Bay. The baths are backed by a sandy beach, a walking track and a small park.

The Beach Suitability Grade of Good indicates that the water quality is safe for swimming most of the time but can be susceptible to pollution after heavy rain, with potential faecal contamination from river discharge.

The response to rainfall graph indicates that enterococci levels increased with increasing rainfall, frequently exceeding the safe swimming limit in response to 5mm of rainfall or more.

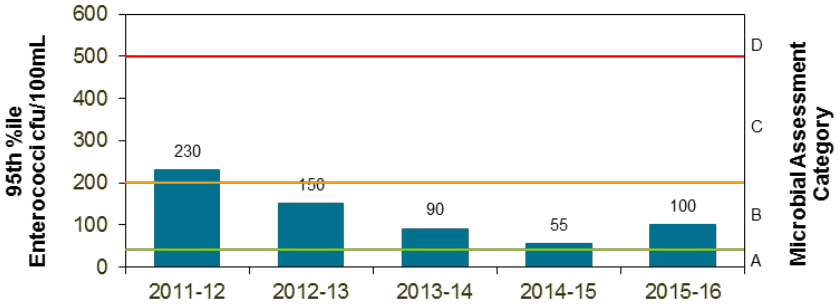
The site has been monitored since 1994.

Sanitary Inspection: **Moderate**



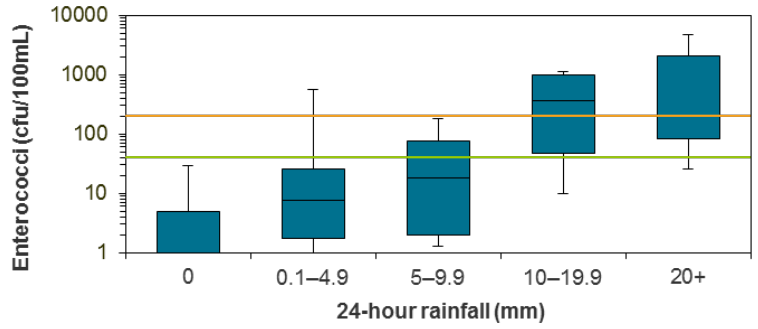
Microbial Assessment: **B**

Monitoring period for 2015–16 result is December 2013 to April 2016.

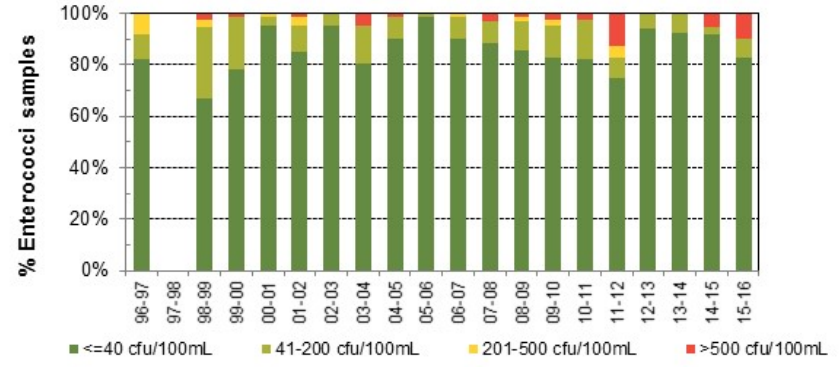


Response to rainfall

Rainfall from Kyeemagh rain gauge



Trends in enterococci data through time



Monterey Baths

Beach Suitability Grade: G

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

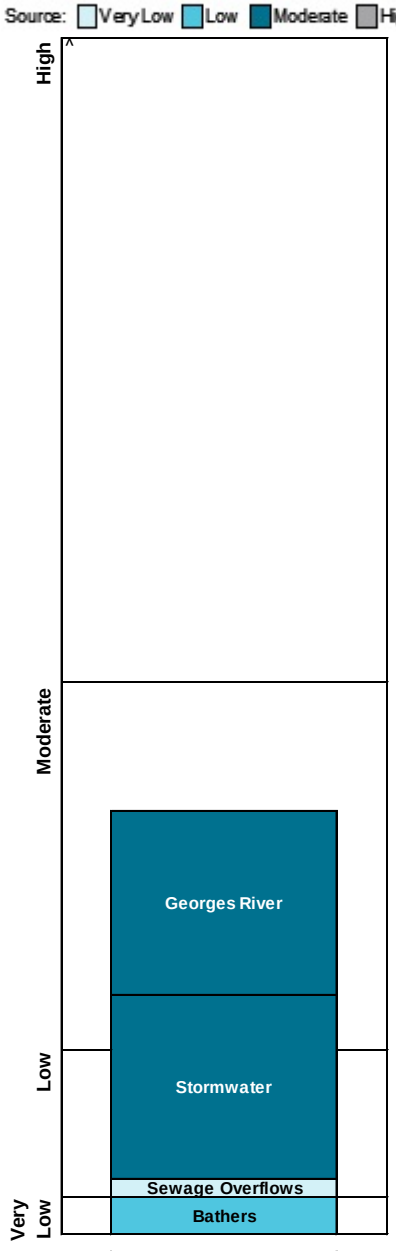
Monterey Baths are located towards the southern end of Lady Robinsons Beach in Botany Bay. The sampling site is near a large stormwater drain, backed by a sandy beach.

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

The response to rainfall graph indicates that enterococci levels increased with increasing rainfall, frequently exceeding the safe swimming limit after 5mm or more of rainfall.

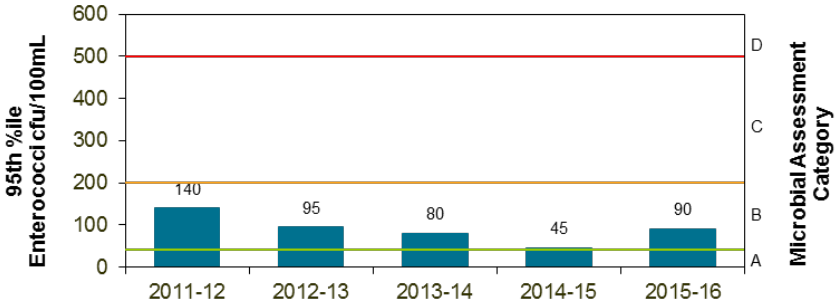
The site has been monitored since 1994.

Sanitary Inspection: **Moderate**



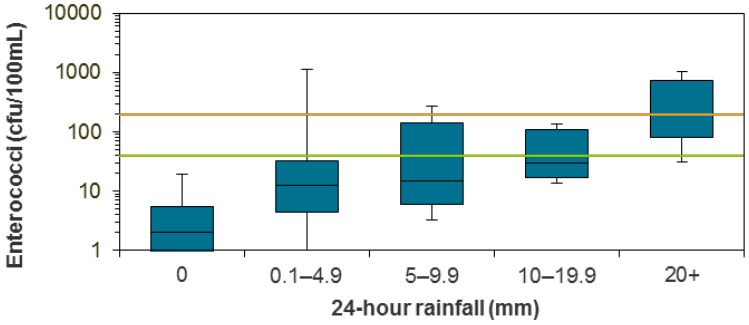
Microbial Assessment: **B**

Monitoring period for 2015–16 result is December 2013 to April 2016.

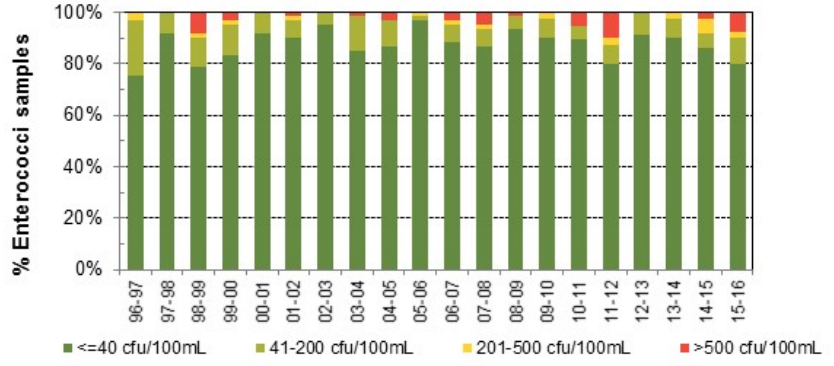


Response to rainfall

Rainfall from Kyeemagh rain gauge



Trends in enterococci data through time



Brighton-Le-Sands Baths

Beach Suitability Grade: G

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

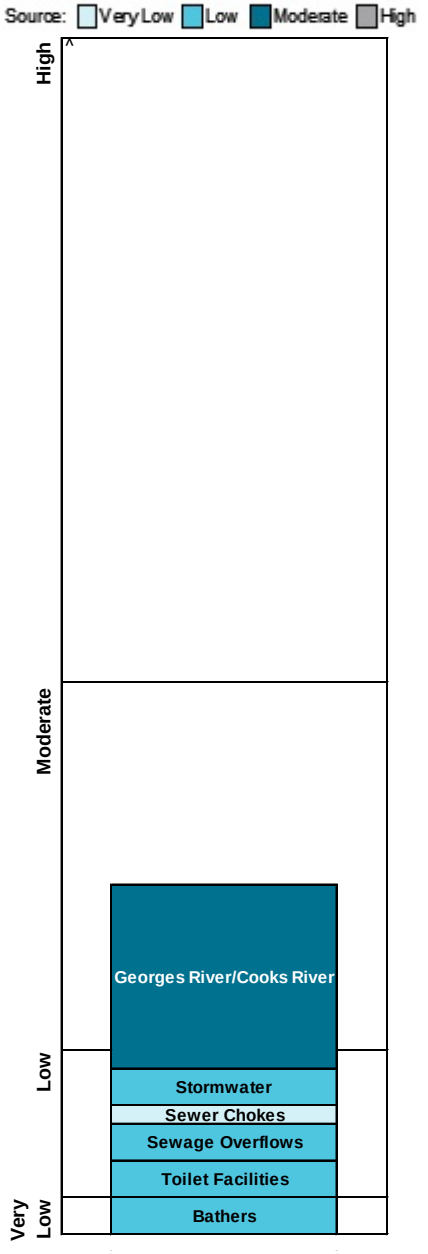
Brighton-Le-Sands Baths are located towards the centre of Lady Robinsons Beach. The baths are netted and backed by a sandy beach and restaurant.

The Beach Suitability Grade of Good indicates that microbial water quality is suitable for swimming most of the time but the water may be susceptible to pollution from a number of potential sources of faecal contamination including sewage overflows and river discharge.

The response to rainfall graph indicates that enterococci levels increased with increasing rainfall, regularly exceeding the safe swimming limit in response to 20mm of rainfall or more.

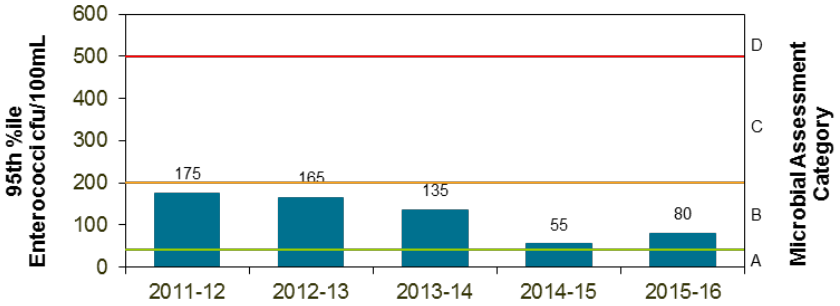
The site has been monitored since 1994.

Sanitary Inspection: **Moderate**



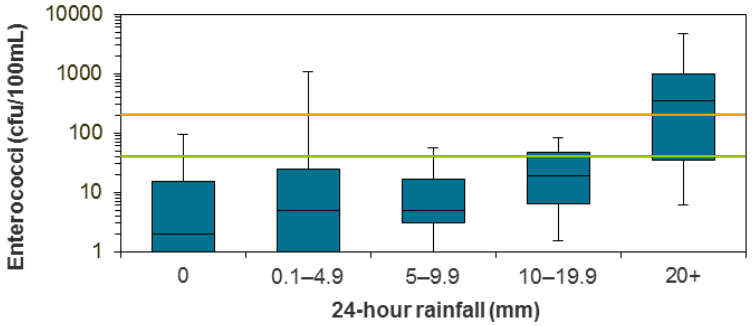
Microbial Assessment: **B**

Monitoring period for 2015–16 result is December 2013 to April 2016.

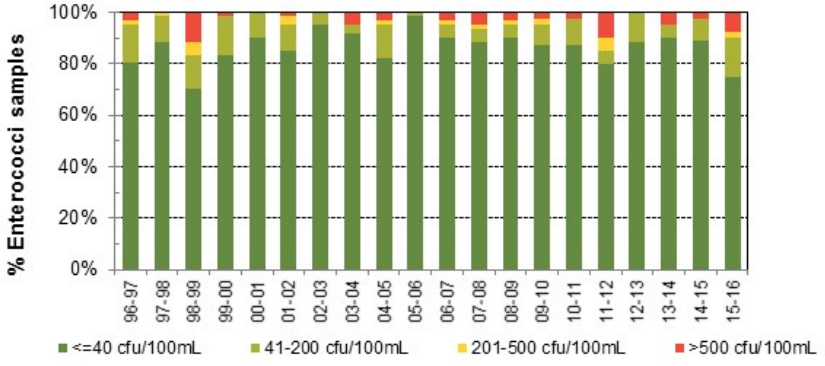


Response to rainfall

Rainfall from Kyeemagh rain gauge



Trends in enterococci data through time



Kyeemagh Baths

Beach Suitability Grade: G

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

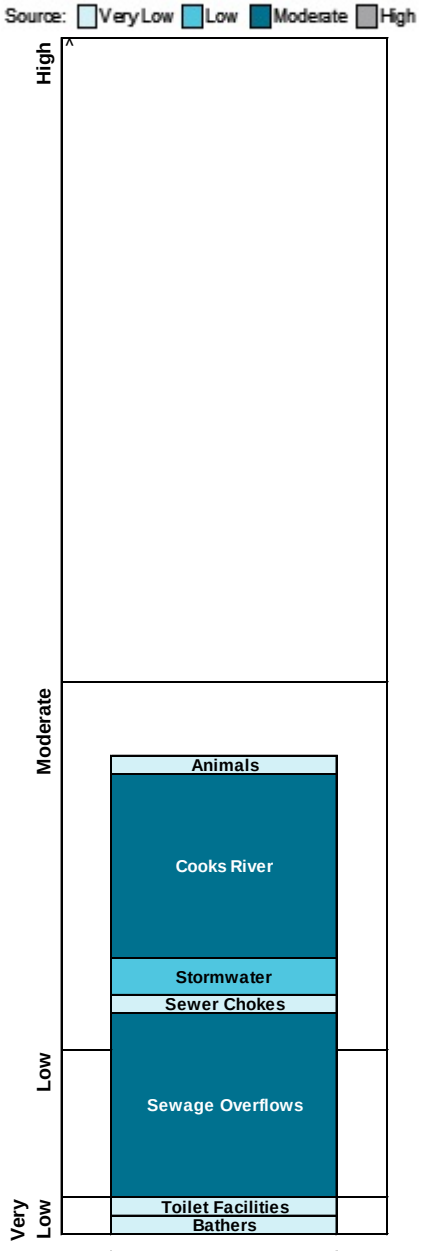
Kyeemagh Baths are located at the northern end of Lady Robinsons Beach. The baths are netted and backed by a sandy beach and reserve.

The Beach Suitability Grade of Good indicates that microbial water quality is suitable for swimming most of the time but the water may be susceptible to pollution from a number of potential sources of faecal contamination including the Cooks River, stormwater and sewage overflows.

The response to rainfall graph indicates that enterococci levels increased with increasing rainfall, often exceeding the safe swimming limit in response to light rainfall and frequently after 10mm of rainfall or more.

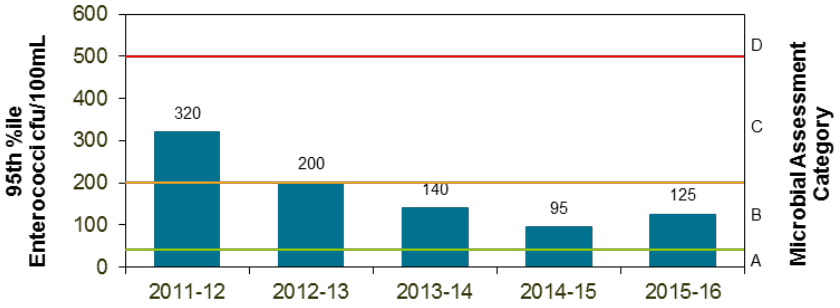
The site has been monitored since 1994.

Sanitary Inspection: **Moderate**



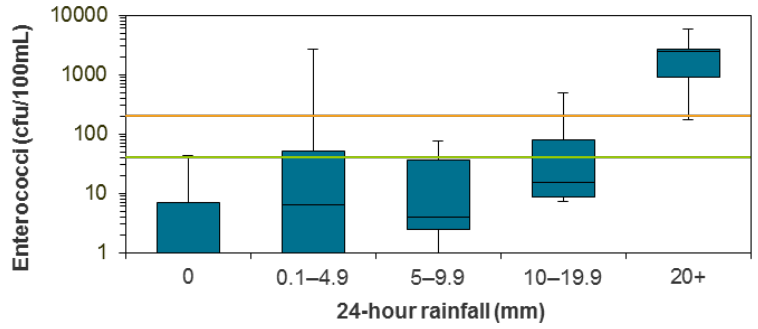
Microbial Assessment: **B**

Monitoring period for 2015–16 result is December 2013 to April 2016.

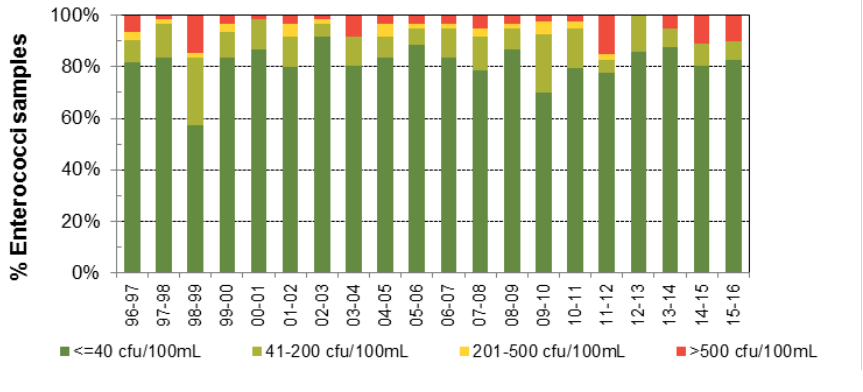


Response to rainfall

Rainfall from Kyeemagh rain gauge



Trends in enterococci data through time



Foreshores Beach

Beach Suitability Grade: VP

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

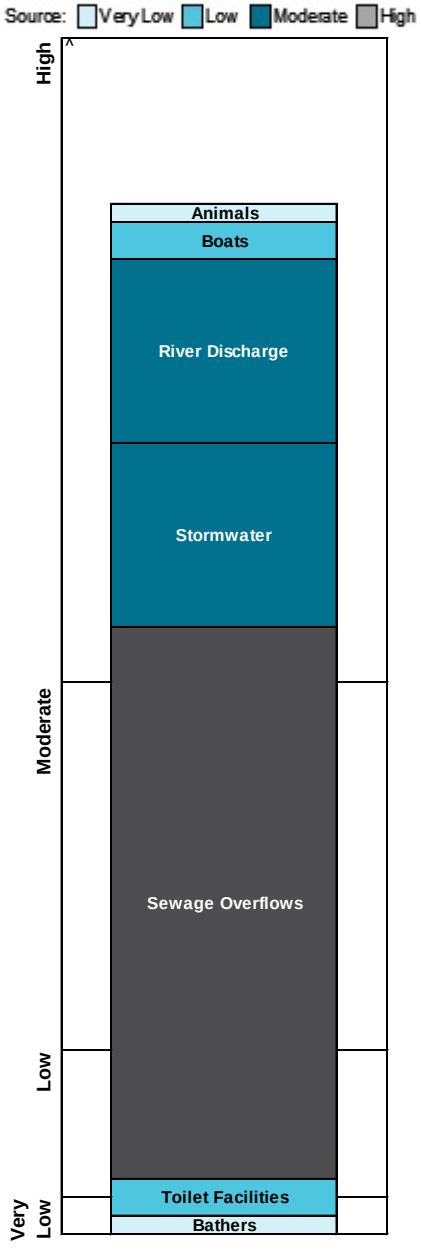
Foreshores Beach is adjacent to Sydney Airport's third runway and the Port Botany Terminal 3 completed in late 2013. The swimming area is not netted and has recently been redeveloped to include toilets, a carpark and boat launching facilities.

The Beach Suitability Grade of Very Poor indicates that microbial water quality is highly influenced by faecal pollution, particularly after rainfall, and is very susceptible to faecal contamination from the sewage overflows which discharge into Mill Pond Creek.

The response to rainfall graph indicates that enterococci levels increased with increasing rainfall, often exceeding the safe swimming limit in response to little or no rain, and frequently after 5mm or more.

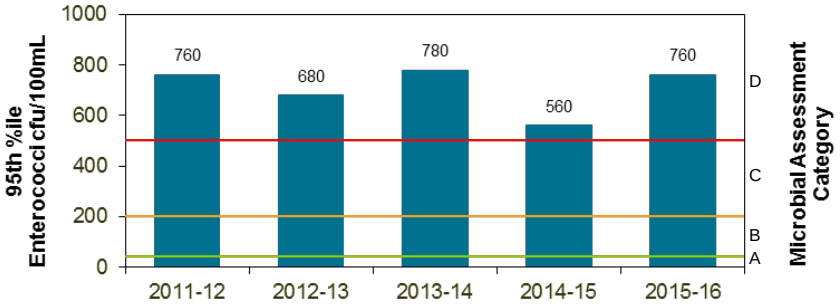
The site has been monitored since 1994.

Sanitary Inspection: **High**



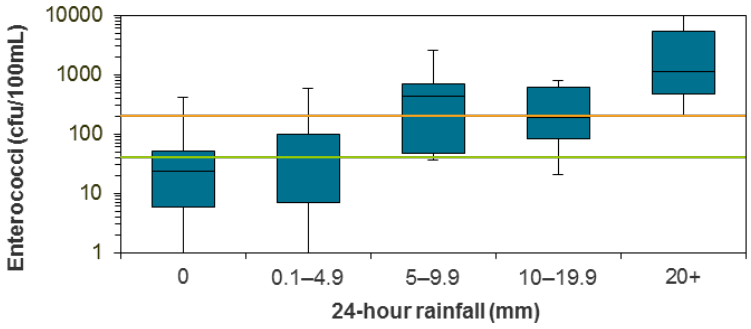
Microbial Assessment: **D**

Monitoring period for 2015–16 result is December 2013 to April 2016.

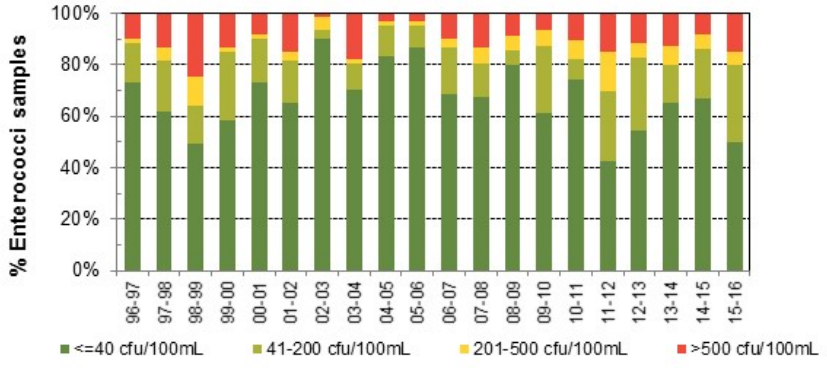


Response to rainfall

Rainfall from Malabar WWTP rain gauge



Trends in enterococci data through time



Yarra Bay

Beach Suitability Grade: P

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

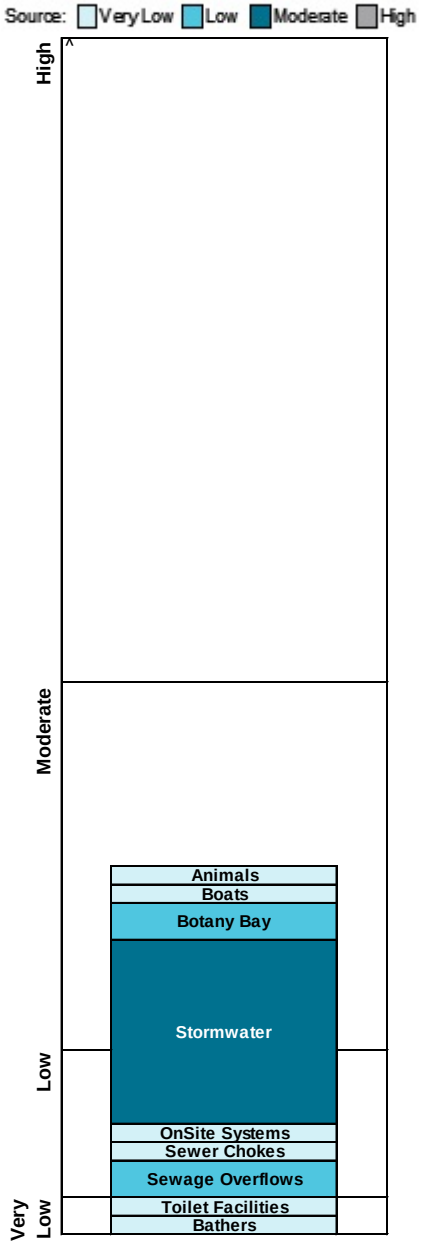
Yarra Bay is approximately 750 metres long, with a rock groyne 100 metres from the southern end. The swimming area is not netted. The southern half of the beach is bordered by Yarra Bay Bicentennial Park and Yarra Bay Sailing Club.

The Beach Suitability Grade of Poor indicates microbial water quality is influenced by faecal pollution, particularly after rainfall and sometimes during dry weather conditions, with a number of potential sources of faecal contamination including stormwater.

The response to rainfall graph indicates that enterococci levels generally increased with increasing rainfall, sometimes exceeding the safe swimming limit after little or no rainfall and frequently after 5mm of rainfall or more.

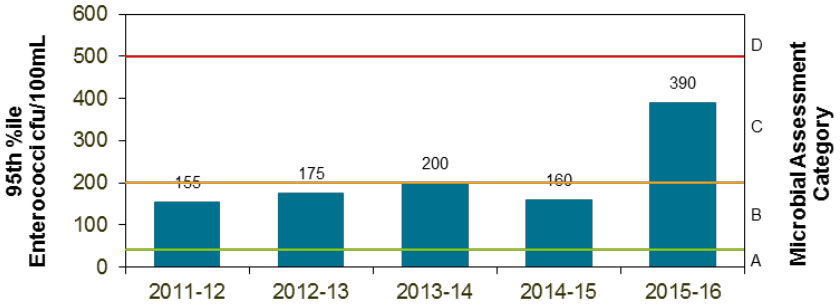
The site has been monitored since 1994.

Sanitary Inspection: **Moderate**



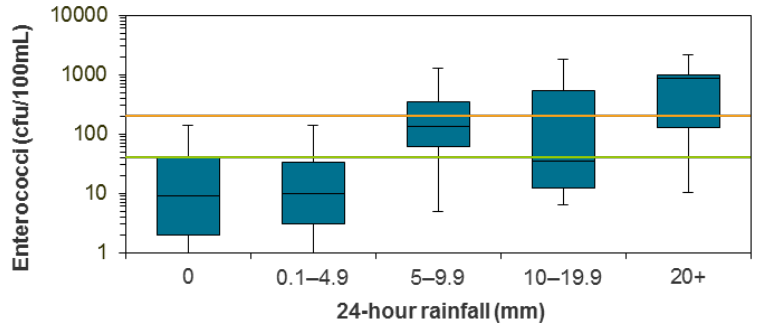
Microbial Assessment: **C**

Monitoring period for 2015–16 result is December 2013 to April 2016.

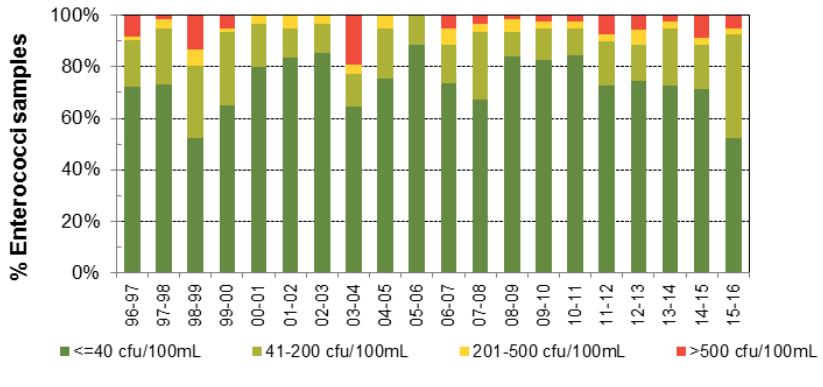


Response to rainfall

Rainfall from Malabar WWTP rain gauge



Trends in enterococci data through time



Frenchmans Bay

Beach Suitability Grade: G

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

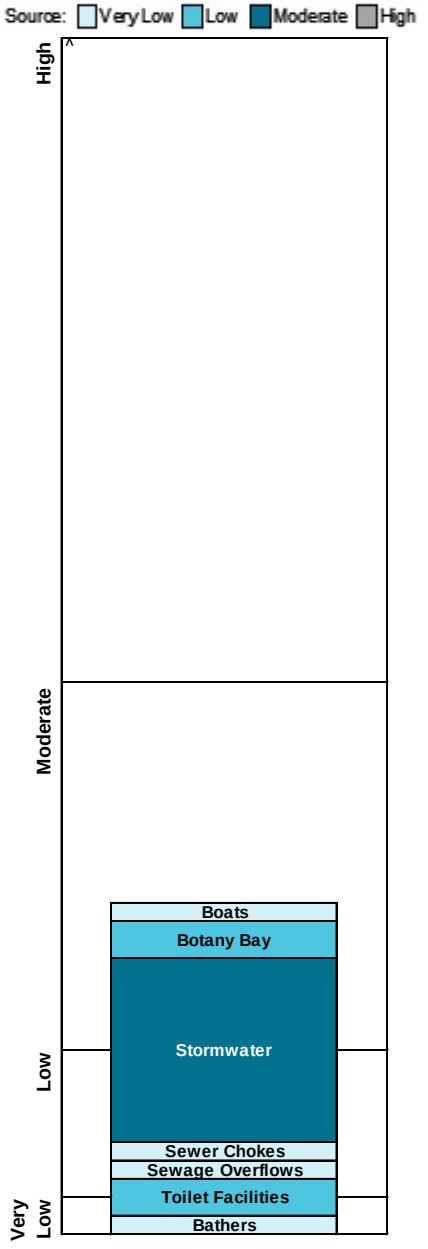
Frenchmans Bay is approximately 500 metres long, with a rock wall towards the northern end. The swimming area is not netted. A small recreational reserve is located behind the southern end of the beach.

The Beach Suitability Grade of Good indicates that the water quality is safe for swimming most of the time but can be susceptible to pollution after heavy rain, from a number of potential sources of faecal contamination including stormwater.

The response to rainfall graph indicates that enterococci levels increased with increasing rainfall, often exceeding the safe swimming limit after 10mm of rainfall or more.

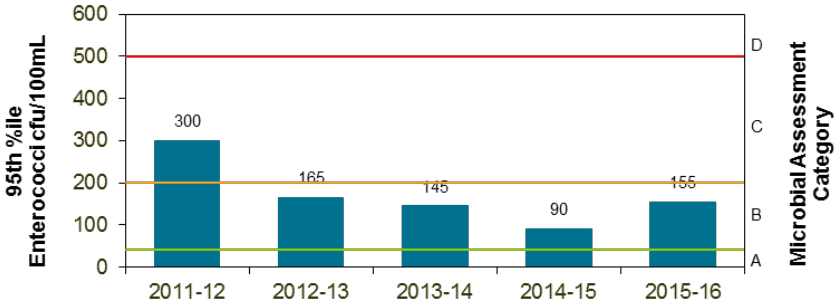
The site has been monitored since 1994.

Sanitary Inspection: **Moderate**



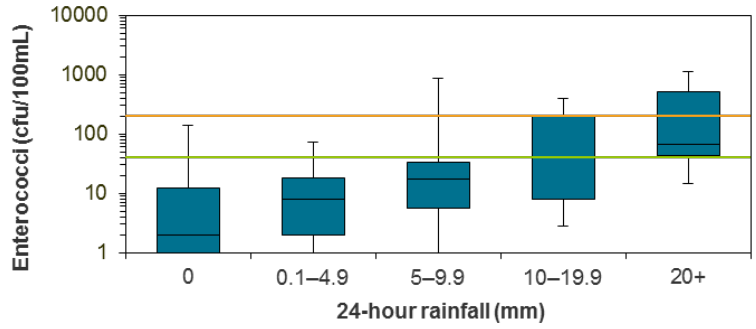
Microbial Assessment: **B**

Monitoring period for 2015–16 result is December 2013 to April 2016.

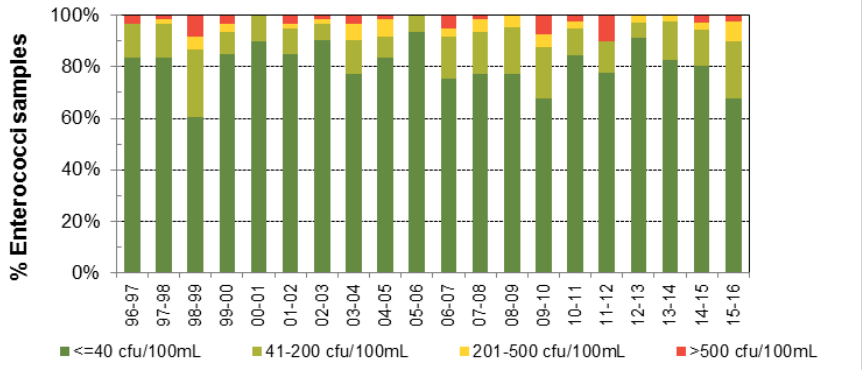


Response to rainfall

Rainfall from Malabar WWTP rain gauge



Trends in enterococci data through time



Congwong Bay

Beach Suitability Grade: VG

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

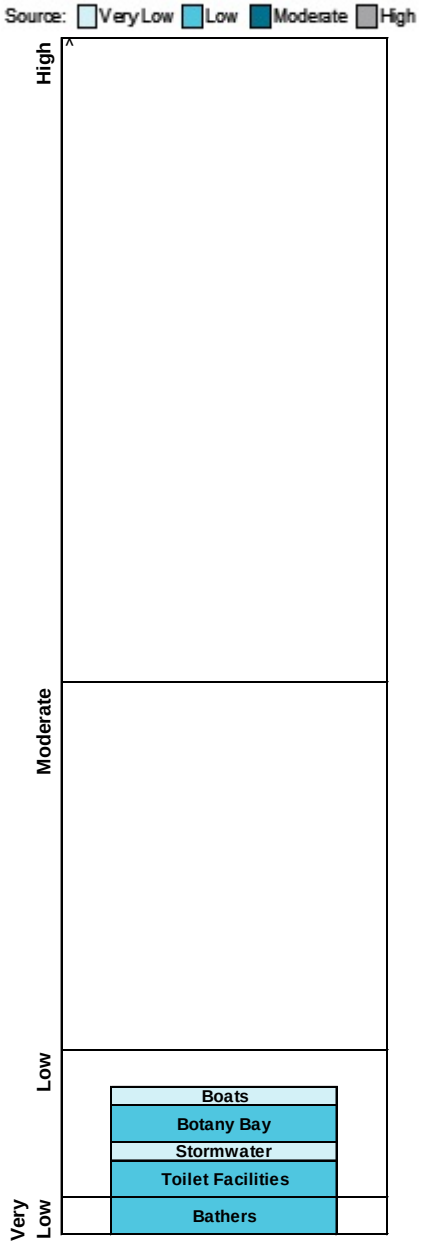
Congwong Bay is near the mouth of Botany Bay and is backed by the Botany Bay National Park. The beach is approximately 150 metres long and the swimming area is not netted.

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

The response to rainfall graph indicates that enterococci levels increased with increasing rainfall, often exceeding the safe swimming limit in response to 10mm of rainfall or more.

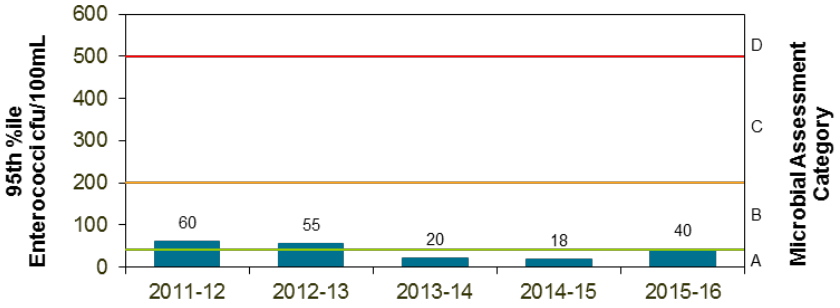
The site has been monitored since 1994.

Sanitary Inspection: **Low**



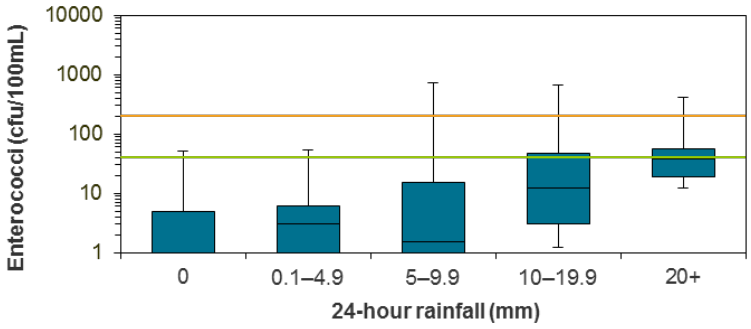
Microbial Assessment: **A**

Monitoring period for 2015–16 result is December 2013 to April 2016.

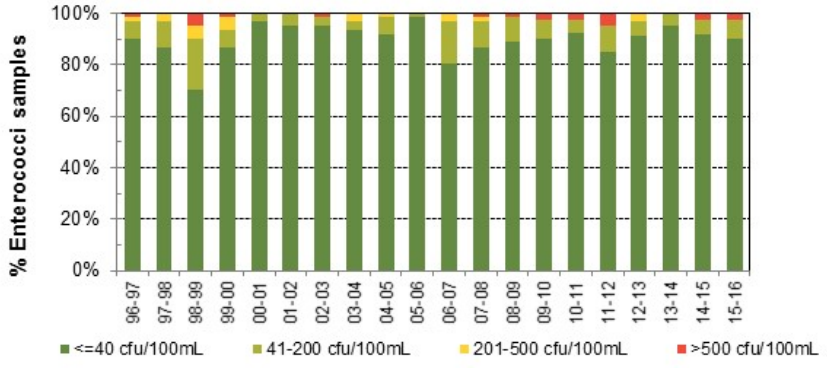


Response to rainfall

Rainfall from Malabar WWTP rain gauge



Trends in enterococci data through time



Jibbon Beach

Beach Suitability Grade: G

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

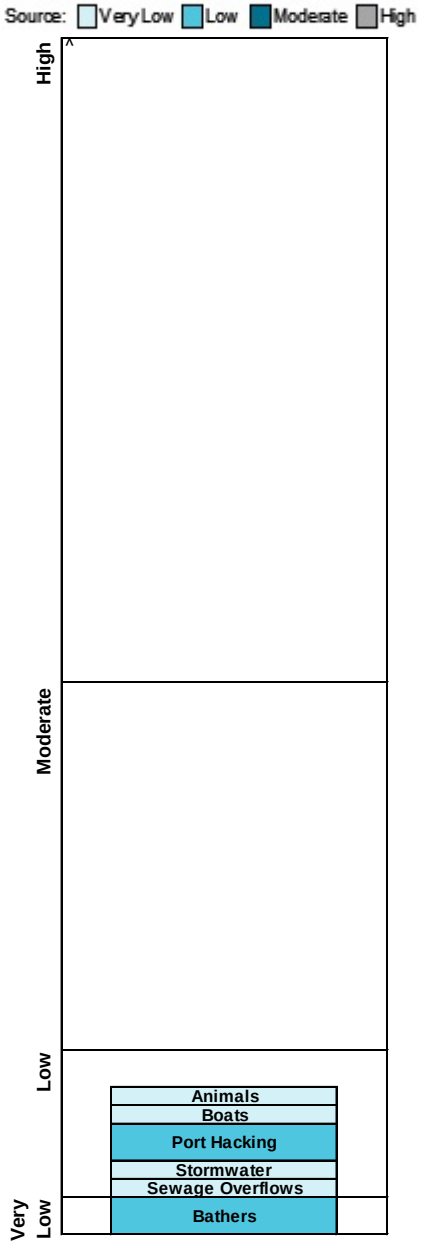
Jibbon Beach is located at the entrance to Port Hacking. The beach is backed by the Royal National Park and accessed from Bundeena. The water is deep, making it a popular boating destination. Beach conditions are safest in the eastern corner.

The Beach Suitability Grade of Good indicates that the water quality is safe for swimming most of the time but can be susceptible to pollution after heavy rain, from a number of potential sources of faecal contamination.

The response to rainfall graph indicates that enterococci levels increased slightly with rainfall, and sometimes exceeded the safe swimming limit in response to 20mm or more of rainfall.

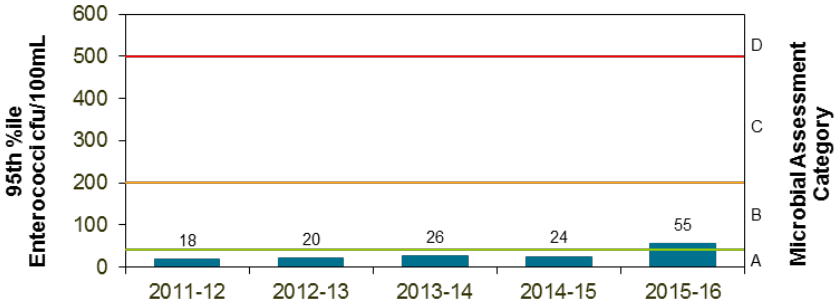
The site has been monitored since 1999.

Sanitary Inspection: **Low**



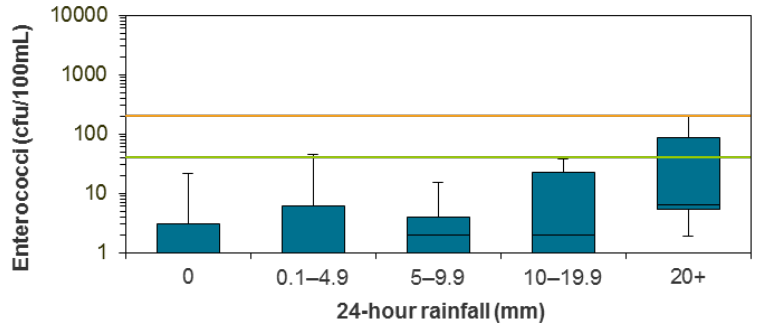
Microbial Assessment: **B**

Monitoring period for 2015–16 result is December 2013 to April 2016.

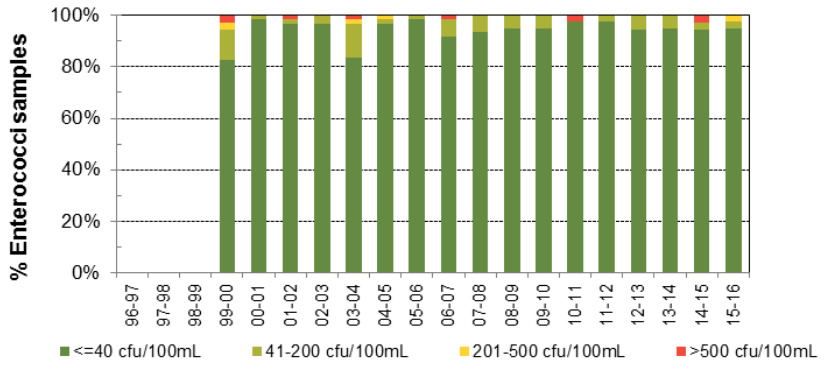


Response to rainfall

Rainfall from South Cronulla rain gauge



Trends in enterococci data through time



Horderns Beach

Beach Suitability Grade: G

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

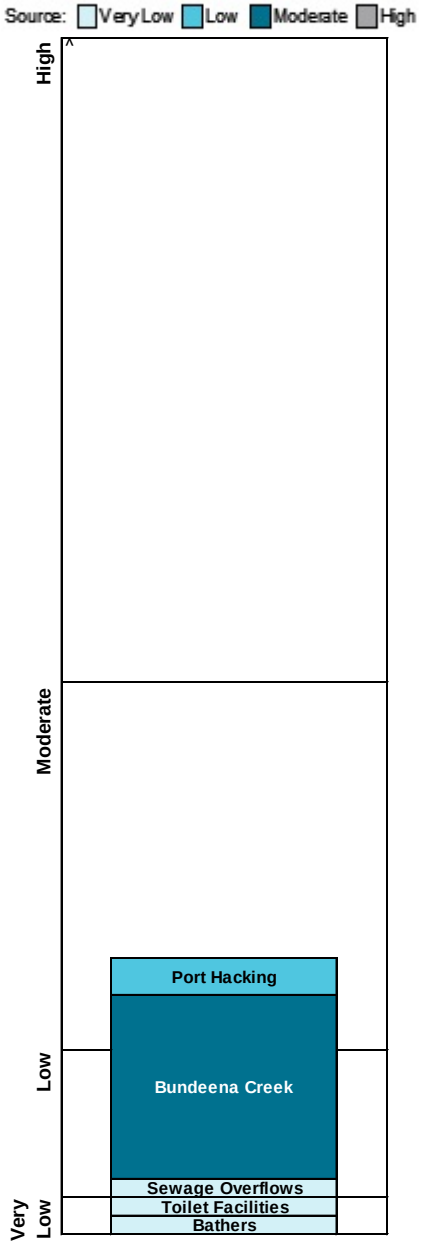
Horderns Beach is located on the southern shore of Port Hacking and is backed by the town of Bundeena. The Cronulla–Bundeena wharf is located at the eastern end of the beach.

The Beach Suitability Grade of Good indicates that the water quality is safe for swimming most of the time but can be susceptible to pollution after heavy rain, from a number of potential sources of faecal contamination including creek discharge.

The response to rainfall graph indicates that enterococci levels increased with increasing rainfall, often exceeding the safe swimming limit after 10mm of rainfall or more and occasionally after little or no rain.

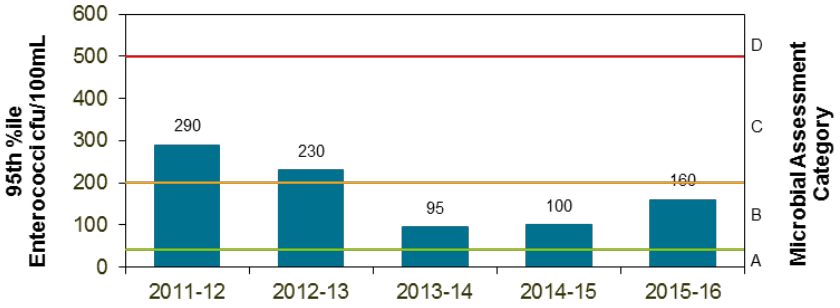
The site has been monitored since 1999.

Sanitary Inspection: **Moderate**



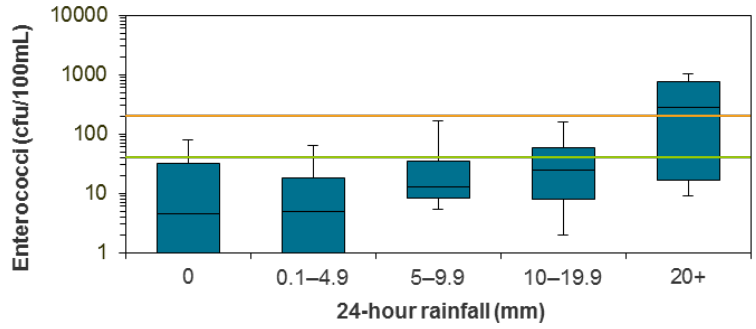
Microbial Assessment: **B**

Monitoring period for 2015–16 result is December 2013 to April 2016.

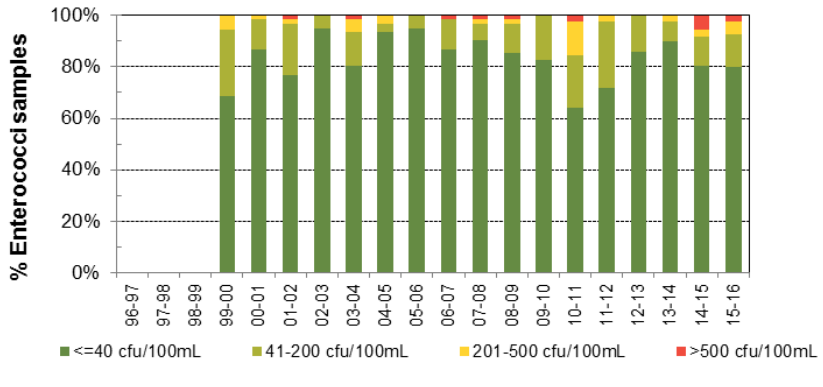


Response to rainfall

Rainfall from South Cronulla rain gauge



Trends in enterococci data through time



Gymea Bay Baths

Beach Suitability Grade: P

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

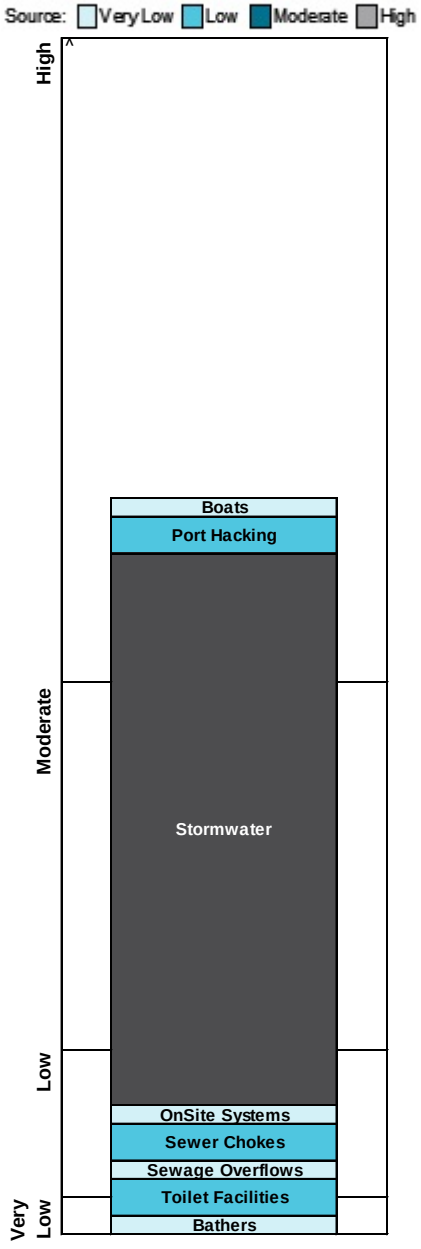
Gymea Bay Baths are an enclosed tidal swimming area backed by a narrow sandy beach in the upper reaches of Port Hacking. Two small recreation reserves lead to the beach.

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

The response to rainfall graph indicates that enterococci levels increased with increasing rainfall, often exceeding the safe swimming limit after low levels of rainfall, and frequently after 5mm or more of rain.

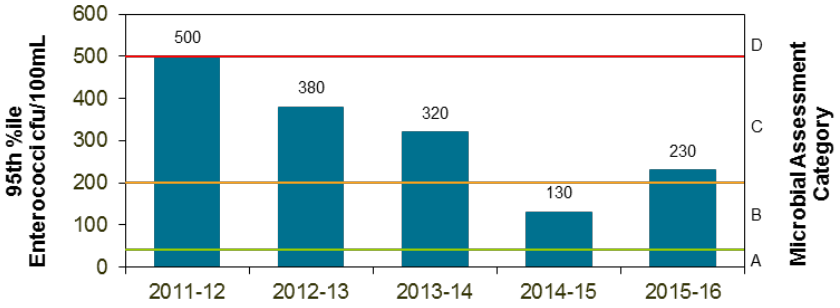
The site has been monitored since 1999.

Sanitary Inspection: **High**



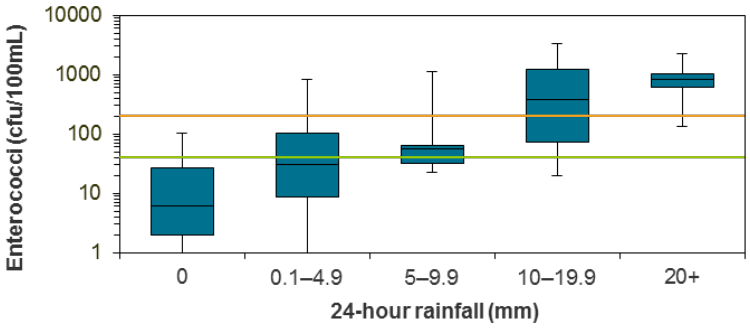
Microbial Assessment: **C**

Monitoring period for 2015–16 result is December 2013 to April 2016.

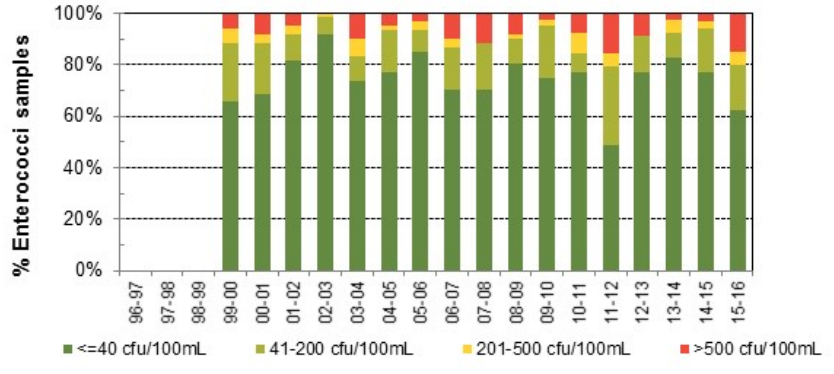


Response to rainfall

Rainfall from Caringbah rain gauge

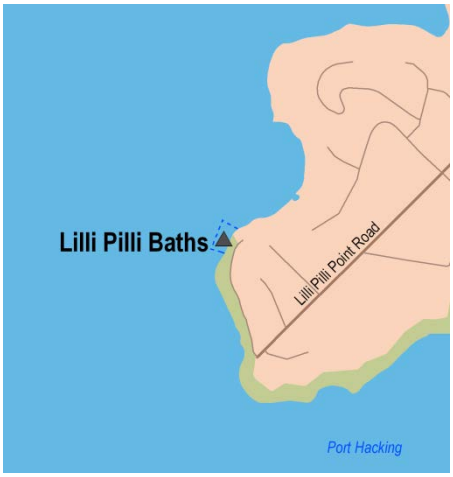


Trends in enterococci data through time



Lilli Pilli Baths

Beach Suitability Grade: G



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

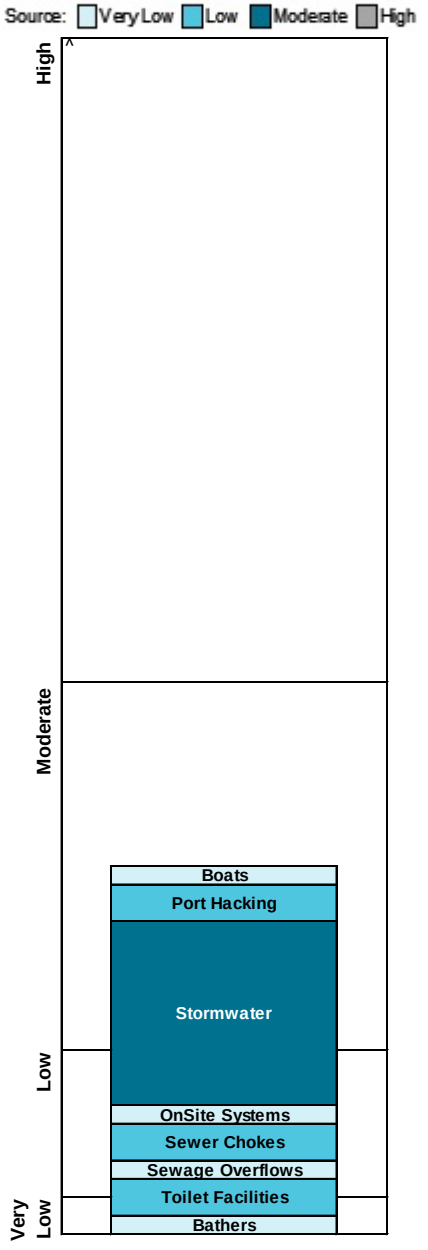
Lilli Pilli Baths is a tidal swimming area on the western side of Lilli Pilli Point in the middle reaches of Port Hacking. The pool is netted and is backed by a narrow strip of recreation reserve.

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

The response to rainfall graph indicates that enterococci levels increased with increasing rainfall, regularly exceeding the safe swimming limit after 5mm of rainfall or more.

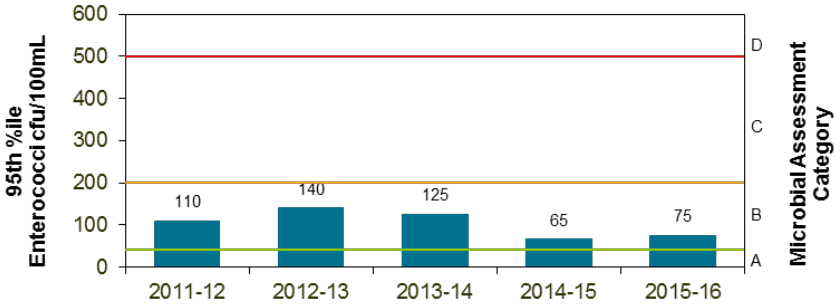
The site has been monitored since 1999.

Sanitary Inspection: **Moderate**



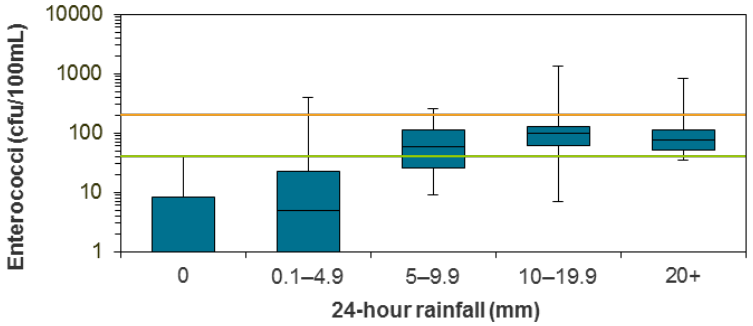
Microbial Assessment: **B**

Monitoring period for 2015–16 result is December 2013 to April 2016.

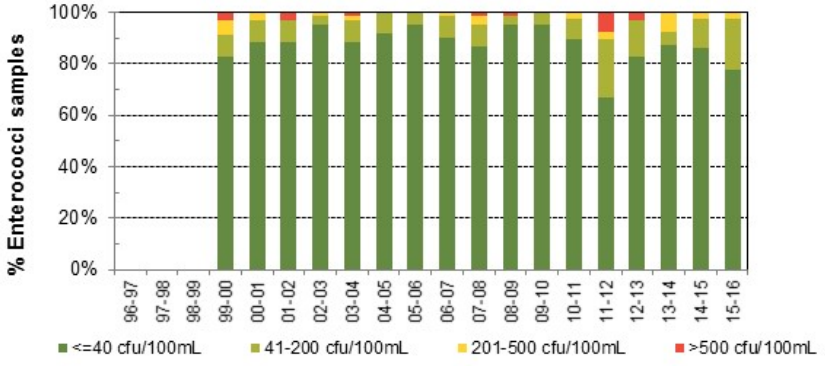


Response to rainfall

Rainfall from Caringbah rain gauge

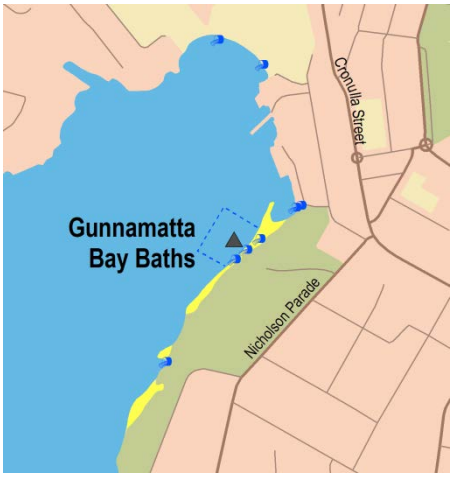


Trends in enterococci data through time



Gunnamatta Bay Baths

Beach Suitability Grade: P



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

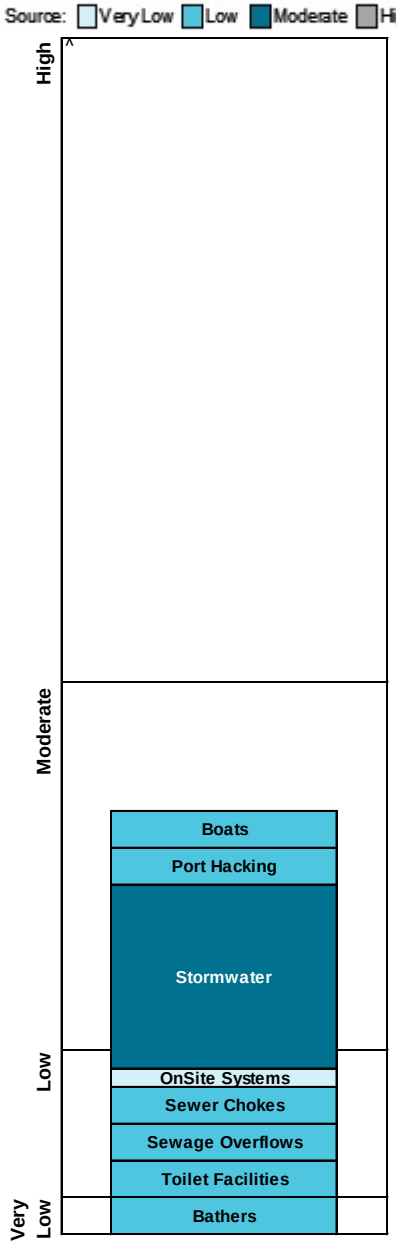
Gunnamatta Bay Baths are an enclosed tidal swimming area located in Gunnamatta Bay. The baths are backed by a narrow sandy beach and a large reserve with picnic facilities.

The Beach Suitability Grade of Poor indicates microbial water quality is influenced by faecal pollution, particularly after rainfall, with a number of potential sources of faecal contamination including stormwater.

The response to rainfall graph indicates that enterococci levels increased with increasing rainfall, regularly exceeding the safe swimming limit in response to 5mm of rainfall or more, and occasionally after light rainfall.

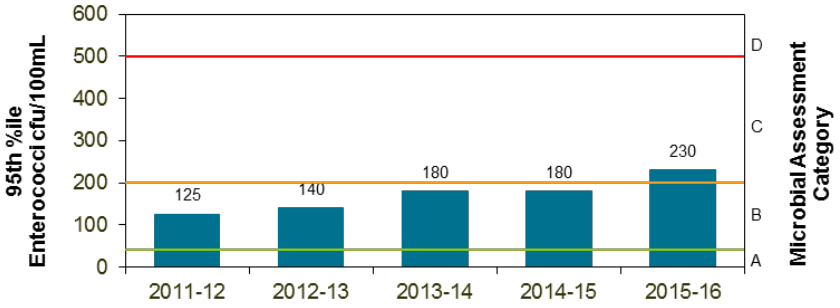
The site has been monitored since 1994. Microbial water quality has improved since 2000–2001 due to sewage overflow abatement works in the catchment.

Sanitary Inspection: **Moderate**



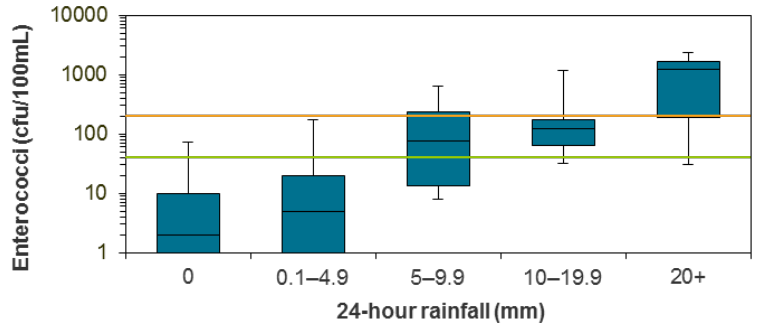
Microbial Assessment: **C**

Monitoring period for 2015–16 result is December 2013 to April 2016.

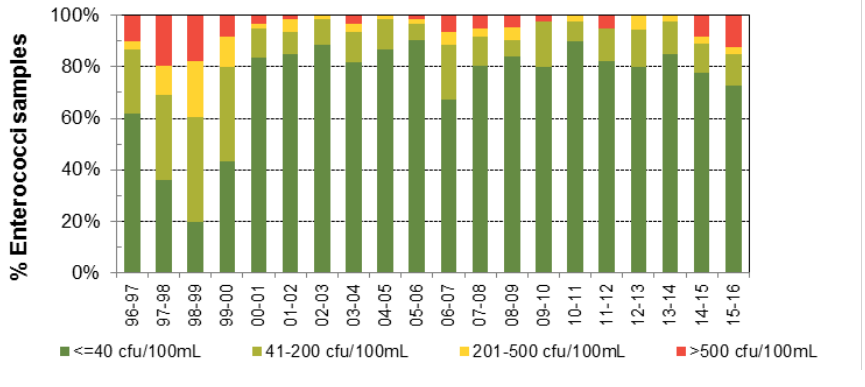


Response to rainfall

Rainfall from South Cronulla rain gauge



Trends in enterococci data through time



State of the Beaches

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.

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.

Beach Suitability Grades are determined by using the following matrix:

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].

[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 www.public.health.wa.gov.au/3/1287/2/publications.pm. Accessed on 6/06/16]

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[3].

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

[3]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.

Matrix used to determine Beach Suitability Grades

		Microbial Assessment Category (MAC)			
		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

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[4].

Category	Enterococci (cfu/100mL)	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; AFR = acute fever and rash

Sanitary Inspection Category (SIC)

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.

Through the sanitary inspection process[5], beaches are categorised to reflect the likelihood of faecal contamination. There are five categories: Very Low, Low, Moderate, High and Very High.

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.

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: www.public.health.wa.gov.au/3/1287/2/publications.pm under Forms and Templates [accessed 06/06/16].

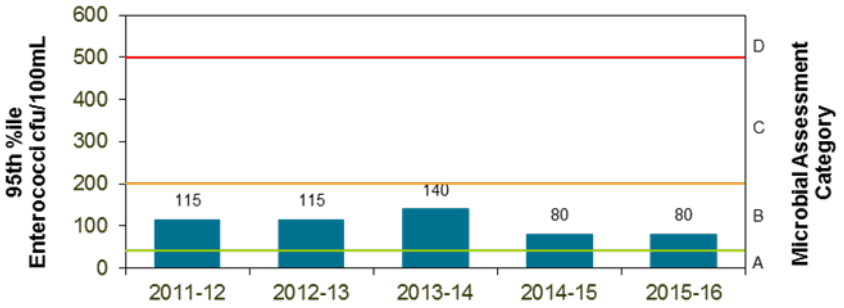
[4] Wyer MD, Kay D, Fleisher JM, Salmon RL, Jones F, Godfree AF, Jackson G and Rogers A 1999, An experimental health related classification for marine waters, *Water Research* 33(3), pp.715–722.

[5] Office of Environment and Heritage 2013, *Sanitary Inspections*, Office of Environment and Heritage, Sydney, NSW, viewed 25 May 2016, www.environment.nsw.gov.au/beach/sanitaryinspections.htm.

Explanation of graphs and charts on beach pages

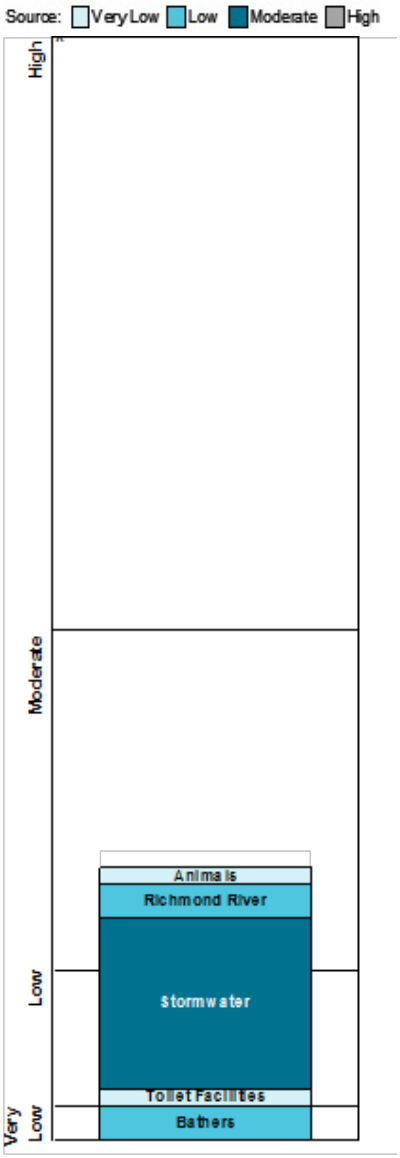
Microbial Assessment Category (MAC) chart

On each beach page, the MACs for the last five years are displayed on a simple bar chart. The bars are labelled with the 95th percentile value for each year and the thresholds dividing the A, B, C and D categories are marked for reference.



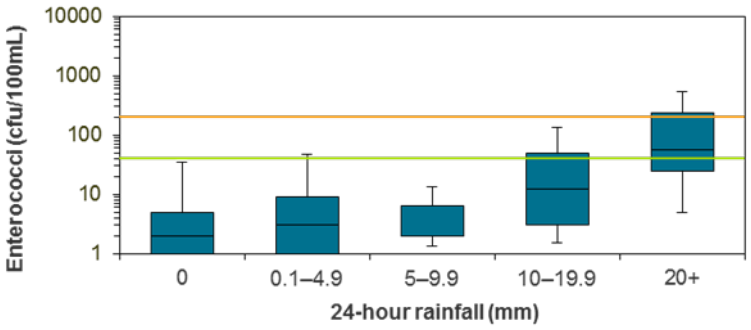
Sanitary Inspection Category (SIC) chart

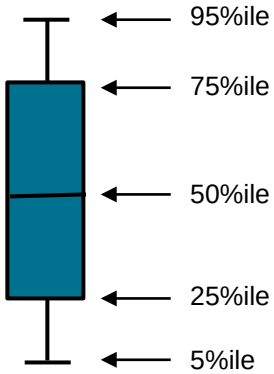
The results of the sanitary inspection for each swimming location are presented in a vertical bar chart, such as the one to the right. The graph shows the likelihood that each identified pollution source will contribute to faecal contamination at a swimming site, as indicated by the size and colour of the components of the bar, with the sum of these contributions being the overall likelihood, or Sanitary Inspection Category.



Response to rainfall plots

Trends in enterococci levels in response to rainfall are shown using a box plot (see below). For reference, enterococci levels of 40cfu/100mL and 200cfu/100mL are indicated with a green and orange line, respectively. The 40cfu/100mL 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 (1cfu/100mL), only the upper portion of the box plots will be visible.



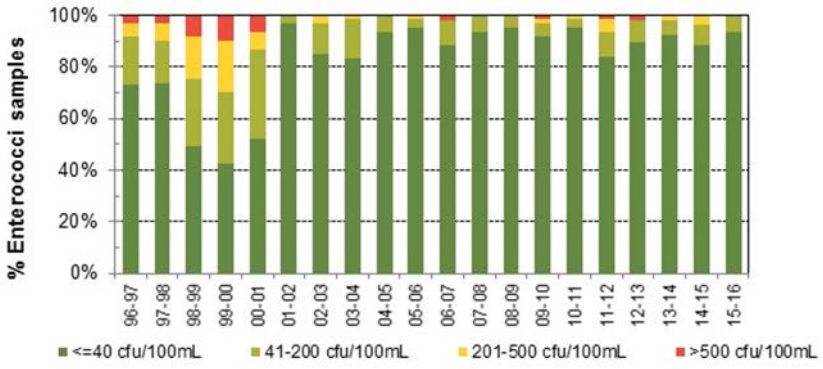


Each part of the box plot represents a significant percentile value of the sample population:

- 5% of the samples lie below the bottom whisker
- 25% of the samples lie below the bottom of the box
- half the samples are on each side of the middle line of the box (median or 50%ile)
- 75% of the samples lie below the top of the box
- 95% of the samples lie below the top whisker.

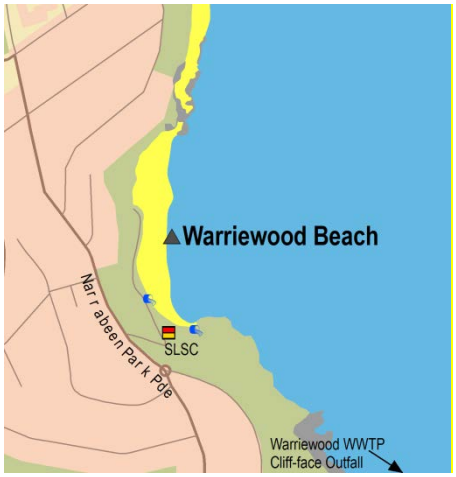
Historical enterococci data graphs

Trends in enterococci levels through time are presented for each swimming location as a bar graph. Each year's bar is colour coded to show the percentage of enterococci results up to 40cfu/100mL, between 41 and 200cfu/100mL, between 201 and 500cfu/100mL and greater than 500cfu/100mL. These categories reflect the Microbial Assessment Category thresholds and are coloured on the graph by dark green, light green, amber and red respectively.



Explanation of maps

A map of individual swimming locations is presented on each beach page. The scale of the maps is 1:15,000. 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.



Key to maps

- Sampling site
- Surf lifesaving club
- Wastewater treatment plant
- Storm sewage treatment plant
- Sewage pumping station
- Stormwater drain
- Water
- Baths
- National park
- Other park/reserve
- Built-up area
- Sand
- Land
- Roads
- Rock/cliff/reef
- Baths – netted area
- Breakwater/wharf