Beachwatch

State of the beaches 2023–24

North Coast region

Department of Climate Change,
Energy, the Environment and Water

NSW GOVERNMENT

Acknowledgement of Country

Department of Climate Change, Energy, the Environment and Water acknowledges the Traditional Custodians of the lands where we work and live.

We pay our respects to Elders past, present and emerging.

This resource may contain images or names of deceased persons in photographs or historical content.

Artist and designer Nikita Ridgeway from Aboriginal design agency Boss Lady Creative Designs created the People and Community symbol.

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Contents

Recreational water quality has been monitored in the North Coast region since 2002 by Ballina Shire Council and Richmond Valley Council under the Department of Climate Change, Energy, the Environment and Water's Beachwatch Partnership Program. This report summarises the performance of 19 swimming sites on the north coast of New South Wales, providing a long-term assessment of how suitable a site is for swimming. Monitored sites include ocean beaches, estuarine areas in Shaws Bay, North Creek and Evans River, and swimming sites in Lake Ainsworth.

In 2023–2024, 53% of swimming sites in the North Coast region were graded as Good or Very Good, including all ocean beaches. These sites were suitable for swimming for most or almost all of the time. The overall decline from the previous year largely reflects the wet weather conditions and flooding events impacting the region in recent years. Despite some Poor grades, the majority of monitored sites were still suitable for swimming during dry weather.

In general, freshwater and estuarine swimming sites do not perform as well as ocean beaches due to lower levels of flushing, increasing the time needed to disperse and dilute pollution inputs, taking longer to recover from stormwater events.

North Coast region summary 2023–2024

Monitoring water quality for swimming in New South Wales

Airforce Beach

Photo: Beachwatch/DCCEEW

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 (2–4 years' worth of data depending on the sampling frequency) and a risk assessment of potential pollution sources.

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

Recreational water quality has been monitored in the North Coast region by Ballina Shire Council since 2002 and Richmond Valley Council since 2006.

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

The Beach Suitability Grade provided for one monitored site in Ballina Shire is provisional and subject to change. **Provisional classifications** are provided where the data available for the microbial assessment, the sanitary inspection or both are

incomplete. Further monitoring is required to obtain the necessary data to provide a definite classification in accordance with national guidelines.

Rainfall impacts

During 2023–2024, 19 swimming sites were monitored including ocean beaches, estuarine areas in Shaws Bay, North Creek and Evans River, and swimming sites in Lake Ainsworth.

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

The Beach Suitability Grades for 2023–2024 are based on water quality data collected over the last 2–4 years. Rainfall over this period has been diverse:

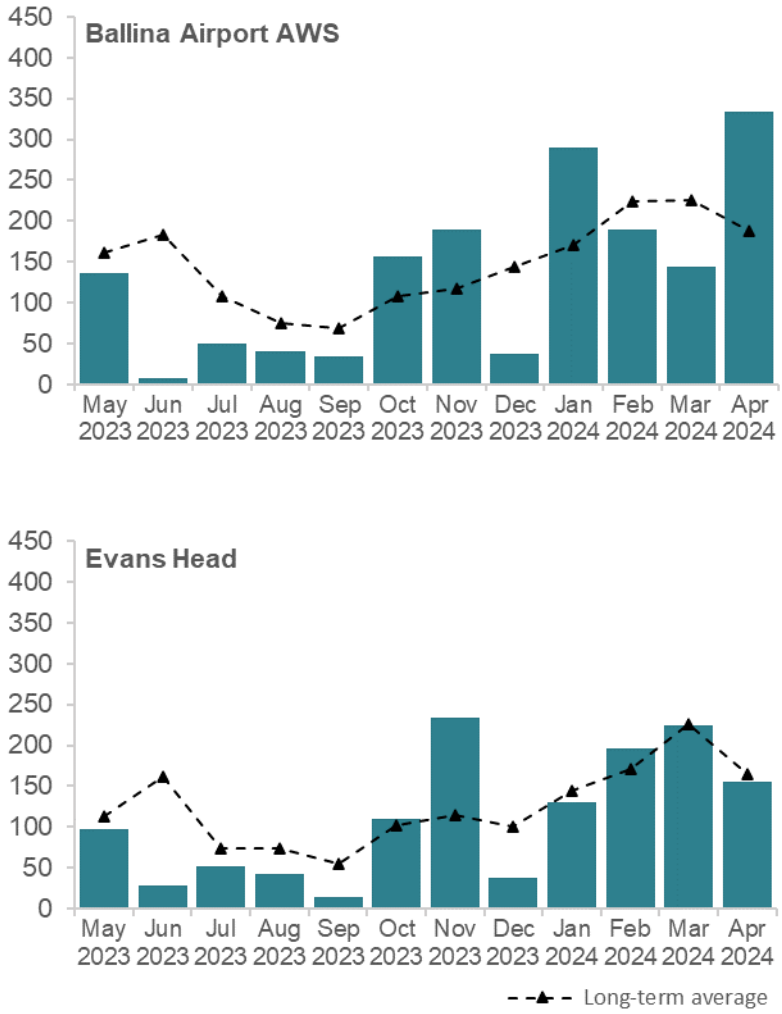
- 2020–2021: rainfall was average to below average except for a very wet summer
- 2021–2022: average to well above average rainfall in spring and a very wet summer, and significant flood events
- 2022–2023: below average rainfall with some very wet months and a dry summer
- 2023–2024: above average rainfall in spring and some wet months.

See the section on **How to read this report** on page 35 for an explanation of the graphs, tables and Beach Suitability Grades.

Rainfall on the North Coast was below the long-term monthly averages from May to September 2023. Above average rainfall was recorded across the region during spring 2023 due to heavy rainfall in October and November.

While rainfall was well below average in December 2023, above average monthly rainfall totals were recorded in January and April 2024 at Ballina.

North Coast region rainfall



Algal blooms

Blue-green algal bloom present in the water

Photo: Rachael Jenner/ Ballina Shire Council

Water NSW and Ballina Shire Council reported the occurrence of freshwater blue-green algal blooms due to *Microcystis aeruginosa* impacting Lake Ainsworth from September to December 2023 and in January and April 2024. Further caution alerts were issued for Lake Ainsworth in May 2023 due to the presence of surface scum with water users advised to avoid impacted areas.

Water NSW also issued a caution alert in November 2023 for *Trichodesmium* sp. impacting Lighthouse Beach in Ballina.

While freshwater and marine algae occur naturally, there were times of heightened risk to recreational users due to rapid increases in abundance causing blooms.

The appearance of **algae** is sometimes mistaken for **sewage contamination** due to a strong odour and thick green scum or discolouration in the water caused by the blooms.

Algae advisories were issued on the Ballina Shire Council, Beachwatch and Water NSW websites, as well as onsite signage during blooms.

Health risks

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

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

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

Beach Suitability Grades for North Coast region

Swimming site	Site type	Beach Suitability Grade	Change
Ballina Shire Council			
Seven Mile Beach	Ocean beach	VG	○
Lake Ainsworth North	Lake/Lagoon	P	○
Lake Ainsworth East	Lake/Lagoon	P	○
Lake Ainsworth South	Lake/Lagoon	G	○
Lake Ainsworth West	Lake/Lagoon	P	○
Shelly Beach	Ocean beach	VG	○
Lighthouse Beach	Ocean beach	VG	○
Shaws Bay North	Estuarine	P	○
Shaws Bay East	Estuarine	P	↓
Shaws Bay East Arm	Estuarine	G	○
Shaws Bay East Beach	Estuarine	G	○
Shaws Bay West	Estuarine	P	○
The Serpentine	Estuarine	G	○
Missingham Beach	Estuarine	P^	○
Richmond Valley Council			
Airforce Beach	Ocean beach	G	○
Main Beach	Ocean beach	G	○
Shark Bay	Ocean beach	VG	○
Evans River	Estuarine	P	○
Elm Street Bridge North (Evans River)	Estuarine	P	○

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

^ Provisional: Information required for the analysis is incomplete due to limited bacterial data or limited information on potential pollution sources in the catchment.

Ballina Shire Council

100%
ocean beaches graded Good or Very Good

Overall results

Seven of the 14 swimming sites were graded as Very Good or Good in 2023–2024, a slight decline in performance to the previous year.

Percentage of sites graded as Very Good or Good

	2021–2022	2022–2023	2023–2024	Trend
Ocean beaches (3 sites)	100%	**100%**	**100%**	
Estuarine sites (7 sites)	67%	**57%**	**43%**	
Lake/ lagoon sites (4 sites)	50%	**25%**	**25%**	

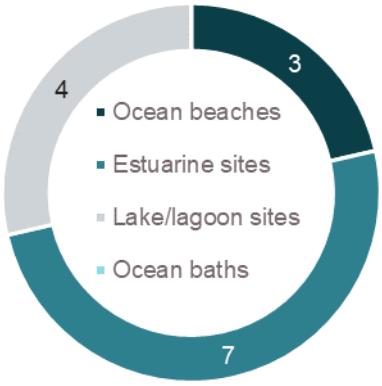
Fourteen swimming sites were monitored by Ballina Shire Council. Samples were collected weekly between November and February and sampling and laboratory analysis was fully funded by the council.

See the section on **How to read this report** on page 35 for an explanation of the graphs, tables and Beach Suitability Grades.

Best beaches

Seven Mile Beach, Shelly Beach and Lighthouse Beach.

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



Site types in Ballina Shire Council

Swimming sites monitored in the Ballina region include ocean beaches, estuarine areas in Shaws Bay and North Creek and lake/lagoon swimming sites in Lake Ainsworth, with each site type having a different response to rainfall-related impacts.

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

As a general precaution swimming should be avoided during and for at least one day after heavy rain at ocean beaches, and for up to 3 days in estuarine areas, or if there are signs of stormwater pollution such as discoloured water or floating debris.

Ocean beaches

Beach Suitability Grades for Ballina Shire Council ocean beaches

Seven Mile Beach, Shelly Beach and Lighthouse Beach continued to be graded as Very Good in 2023–2024. These beaches had excellent water quality and were suitable for swimming almost all of the time.

Estuarine beaches

Beach Suitability Grades for Ballina Shire Council estuarine beaches

Three of the 7 estuarine swimming locations were graded as Good in 2023–2024: Shaws Bay East Arm, Shaws Bay East Beach and The Serpentine. Water quality at these sites was frequently suitable for swimming in dry weather, with 96% or greater of dry weather samples within the safe swimming limit.

Four estuarine swimming sites were graded as Poor in 2023–2024: Shaws Bay North, Shaws Bay East, Shaws Bay West and Missingham Beach. Shaws Bay East was downgraded from Good in the previous year due a decline in microbial water quality. The Poor grade for Missingham Beach is provisional as the assessment is based on limited bacterial data.

While these sites were mostly suitable for swimming during dry weather, elevated bacterial levels were often recorded following light rainfall and regularly after heavy rainfall. Water quality at these sites can be impacted by upstream sources and can take longer to recover due to lower levels of flushing.

The water quality results were influenced by wet weather impacts, with a higher proportion of samples collected at these sites during wet weather conditions compared to the 2022–2023 assessment period.

It is recommended that swimming should be avoided during and for up to 3 days following rainfall at estuarine swimming sites, or if there are signs of pollution such as discoloured water or floating debris.

Lake/lagoon swimming sites

Beach Suitability Grades for Ballina Shire Council lake/lagoon swimming sites

Lake Ainsworth South continued to be graded as Good in 2023–2024. This site was mostly suitable for swimming during dry weather, with 84% of dry weather samples within the safe swimming limit. Elevated enterococci levels were frequently recorded at this site after heavy rainfall.

Lake Ainsworth North, Lake Ainsworth East and Lake Ainsworth West were graded as Poor in 2023–2024, a result consistent with previous years. Elevated bacteria levels were recorded at these lake swimming sites during dry and wet weather conditions. Despite the poor grades, between 66% and 78% of dry weather samples were within the safe swimming limit. These sites may be impacted by a number of significant potential sources of faecal contamination, including stormwater, and have low levels of flushing.

Microbial assessment categories decline slightly for Lake Ainsworth swim sites due to wet weather impacts, with a higher proportion of samples collected at these sites during wet weather conditions compared to the 2022–2023 assessment period.

More information about Ballina Shire Council's **Healthy Waterways** and **Coastal Management Programs** is available on council's website.

During 2019, council investigated the source of microbial contamination by testing additional samples for faecal sterols at sites within Lake Ainsworth. The results found that the main contributors to elevated bacteria levels are from avian (bird) sources.

It is recommended that swimming should be avoided during and for up to 3 days following rainfall or if there are signs of stormwater pollution such as discoloured water or floating debris.

Sampling sites and Beach Suitability Grades in Ballina Shire Council

Seven Mile Beach

Beach grade: VG

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

Seven Mile Beach extends for over 8 km and is patrolled over the summer period.

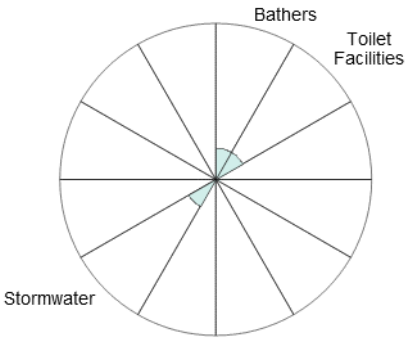
The Beach Suitability Grade of Very Good indicates microbial water quality is considered suitable for swimming almost all the time, with few potential sources of faecal contamination.

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

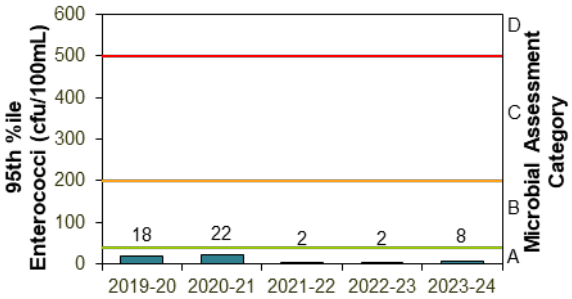
The site has been monitored since 2002.

Site type	Assessment period	Dry weather samples suitable for swimming	Water samples	Beach grade status
Ocean beach	Nov 2019 to Feb 2024	100%	98	Stable

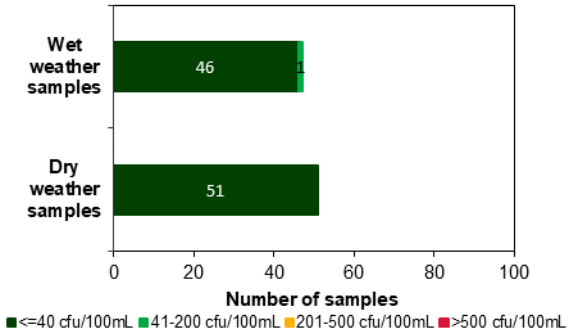
Sanitary inspection: Low



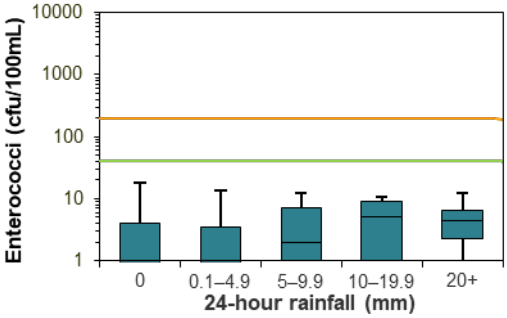
Microbial Assessment Category: A



Dry and wet weather water quality



Water quality in response to rainfall



Lake Ainsworth North

Beach grade: P

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

Lake Ainsworth North is located at the northern end of Lake Ainsworth.

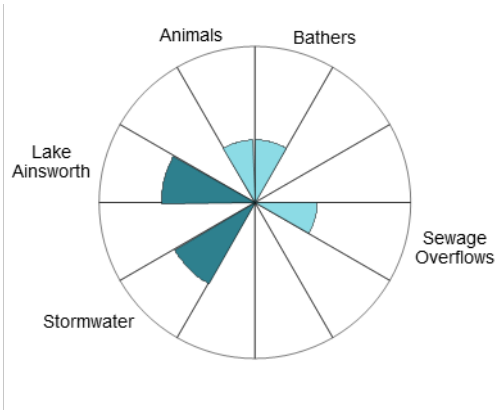
The Beach Suitability Grade of Poor indicates microbial water quality is susceptible to faecal pollution, particularly after rainfall and occasionally during dry weather conditions, with potential faecal contamination from stormwater and elsewhere within the lake.

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

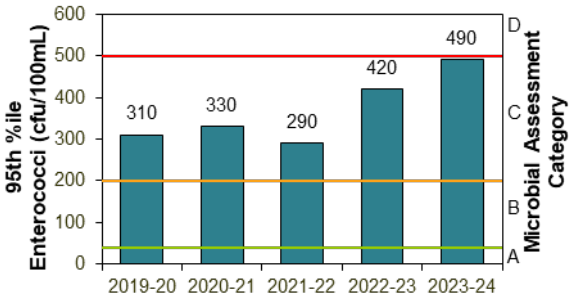
The site has been monitored since 2016.

Site type	Assessment period	Dry weather samples suitable for swimming	Water samples	Beach grade status
Lake/Lagoon	Jun 2019 to Feb 2024	78%	99	Stable

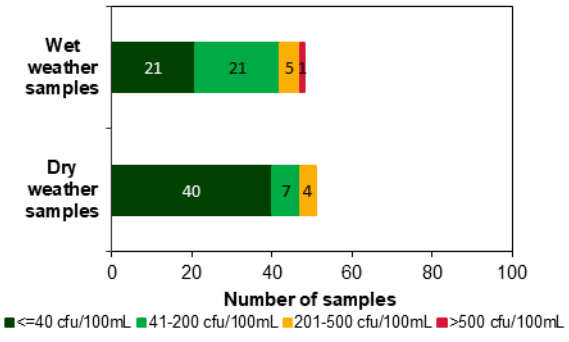
Sanitary inspection: Moderate



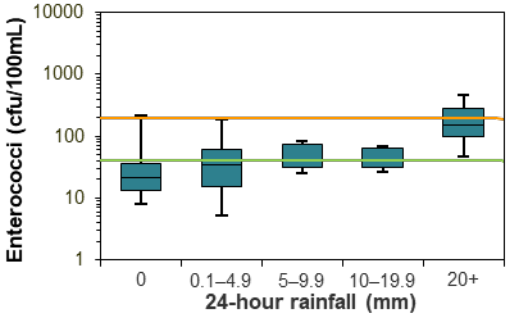
Microbial Assessment Category: C



Dry and wet weather water quality



Water quality in response to rainfall



Lake Ainsworth East

Beach grade: P

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

Lake Ainsworth East is located on the eastern shore of Lake Ainsworth, a coastal freshwater lake.

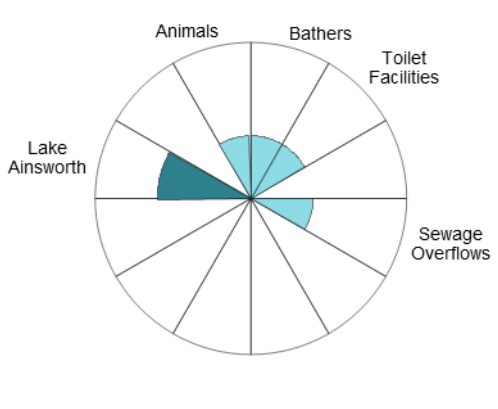
The Beach Suitability Grade of Poor indicates microbial water quality is susceptible to faecal pollution, particularly after rainfall and occasionally during dry weather conditions, with potential faecal contamination from stormwater and elsewhere within the lake.

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

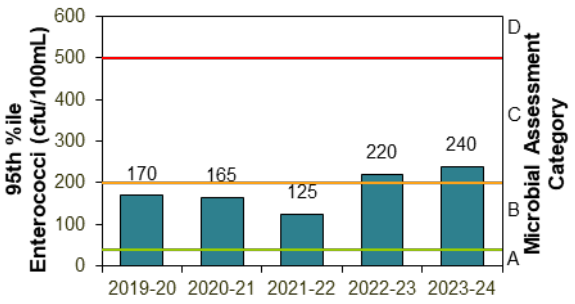
The site was monitored from 2002 until 2009, and since 2012.

Site type	Assessment period	Dry weather samples suitable for swimming	Water samples	Beach grade status
Lake/Lagoon	Nov 2019 to Feb 2024	76%	97	Stable

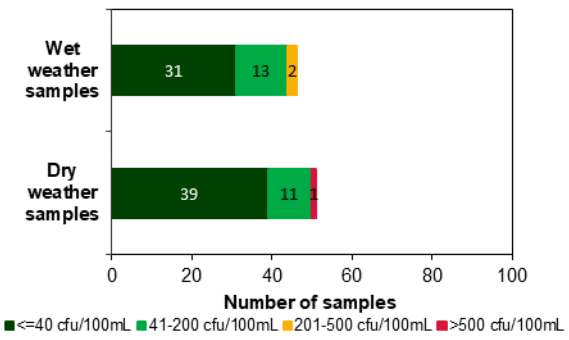
Sanitary inspection: Moderate



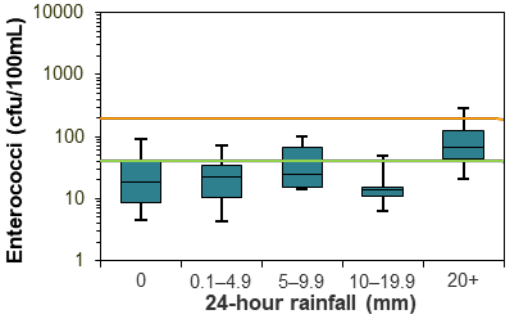
Microbial Assessment Category: C



Dry and wet weather water quality



Water quality in response to rainfall



Lake Ainsworth South

Beach grade: G

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

Lake Ainsworth South is located on the southern shore of Lake Ainsworth, a coastal freshwater lake.

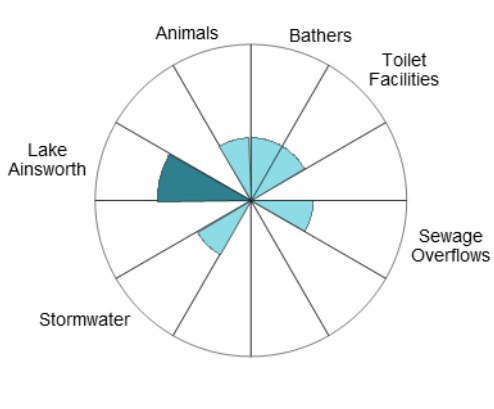
The Beach Suitability Grade of Good indicates microbial water quality is considered suitable for swimming most of the time but may be susceptible to pollution after rain, with several potential sources of faecal contamination including from elsewhere within the lake.

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

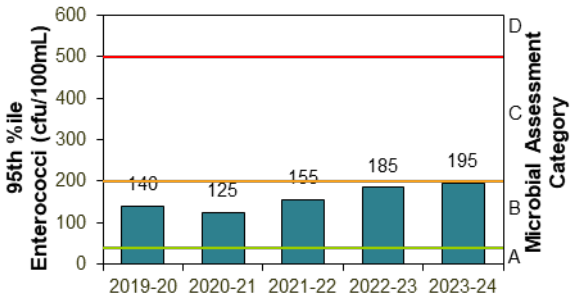
The site was monitored from 2002 until 2009, and since 2012.

Site type	Assessment period	Dry weather samples suitable for swimming	Water samples	Beach grade status
Lake/Lagoon	Jun 2019 to Feb 2024	84%	99	Stable

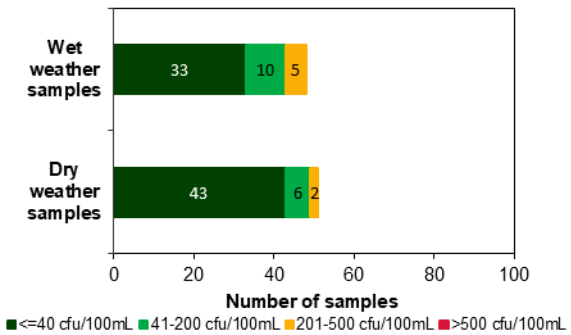
Sanitary inspection: Moderate



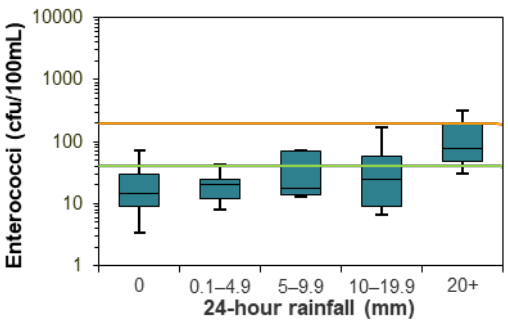
Microbial Assessment Category: B



Dry and wet weather water quality



Water quality in response to rainfall



Lake Ainsworth West

Beach grade: P

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

Lake Ainsworth West is located on the western shore of Lake Ainsworth, a coastal freshwater lake.

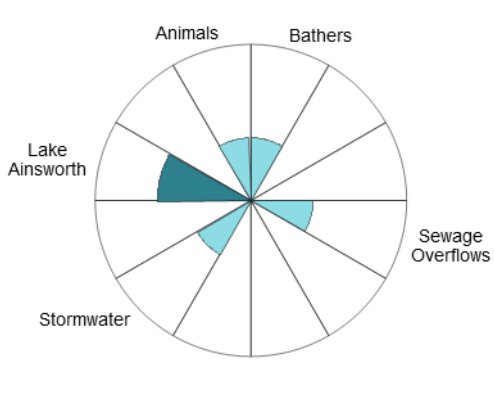
The Beach Suitability Grade of Poor indicates microbial water quality is susceptible to faecal pollution, particularly after rainfall and often during dry weather conditions, with potential faecal contamination from elsewhere within the lake.

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

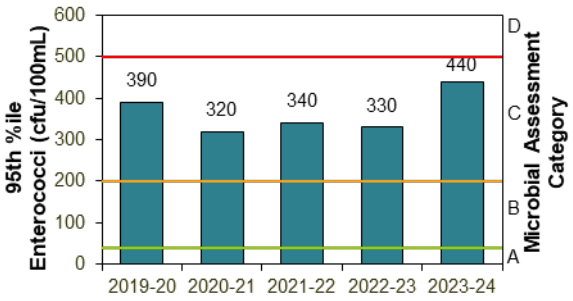
The site has been monitored since 2002.

Site type	Assessment period	Dry weather samples suitable for swimming	Water samples	Beach grade status
Lake/Lagoon	Jun 2019 to Feb 2024	66%	98	Stable

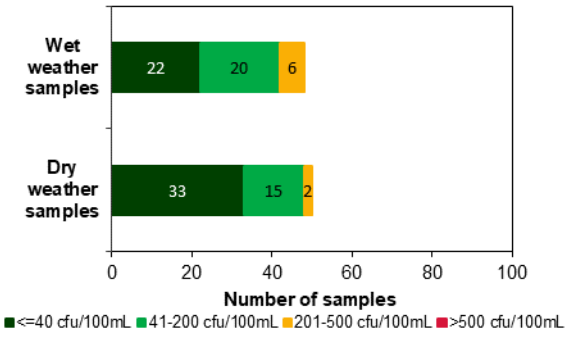
Sanitary inspection: Moderate



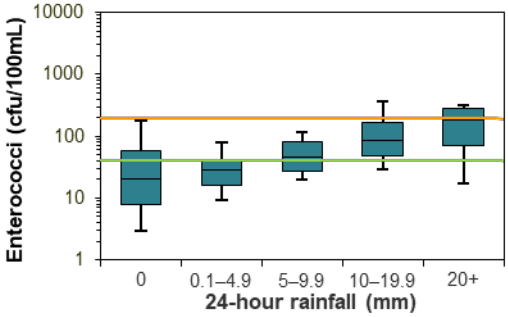
Microbial Assessment Category: C



Dry and wet weather water quality



Water quality in response to rainfall



Shelly Beach

Beach grade: VG

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

Shelly Beach is a 700 m long beach located between Black Head and Richmond River Lighthouse, and is patrolled during holiday periods.

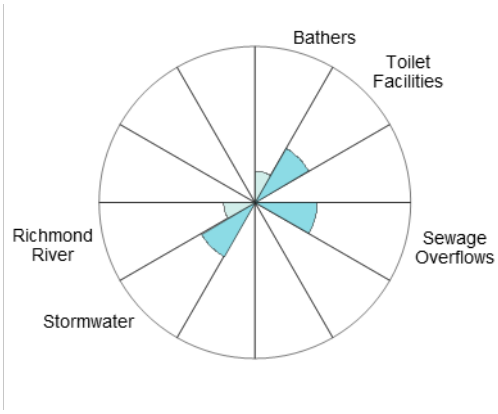
The Beach Suitability Grade of Very Good indicates microbial water quality is considered suitable for swimming almost all of the time, with few potential sources of significant faecal contamination.

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

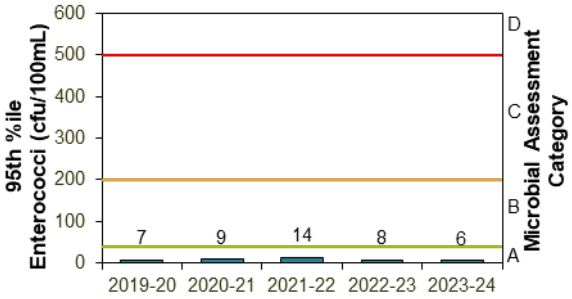
The site has been monitored since 2002.

Site type	Assessment period	Dry weather samples suitable for swimming	Water samples	Beach grade status
Ocean beach	Nov 2019 to Feb 2024	100%	98	Stable

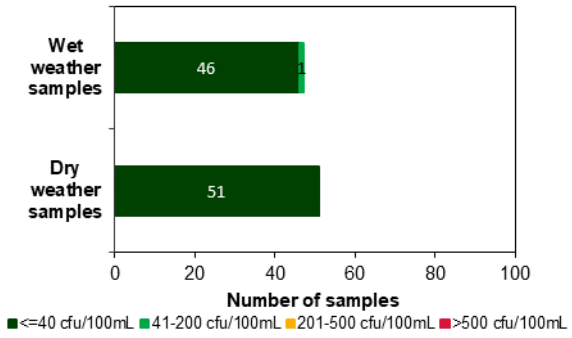
Sanitary inspection: Low



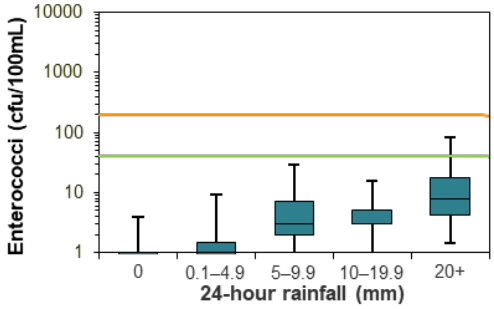
Microbial Assessment Category: A



Dry and wet weather water quality



Water quality in response to rainfall



Lighthouse Beach

Beach grade: VG

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

Lighthouse Beach is situated north of the sea wall at the mouth of the Richmond River and is patrolled during holiday periods.

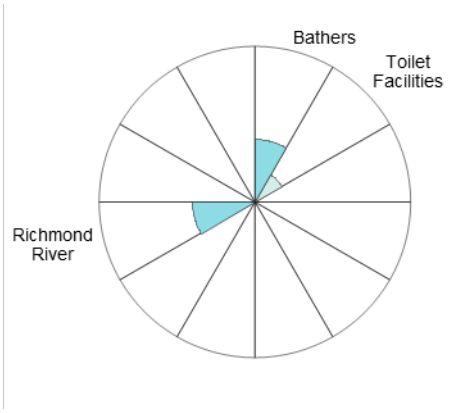
The Beach Suitability Grade of Very Good indicates microbial water quality is considered suitable for swimming almost all of the time, with few potential sources of faecal contamination.

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

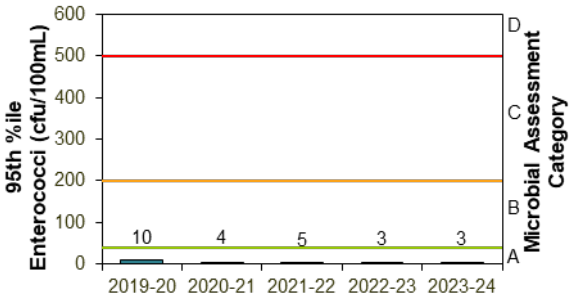
The site was monitored from 2002 until 2003, and since 2009.

Site type	Assessment period	Dry weather samples suitable for swimming	Water samples	Beach grade status
Ocean beach	Nov 2019 to Feb 2024	100%	98	Stable

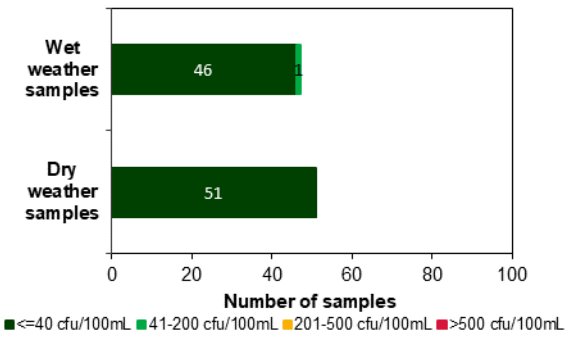
Sanitary inspection: Low



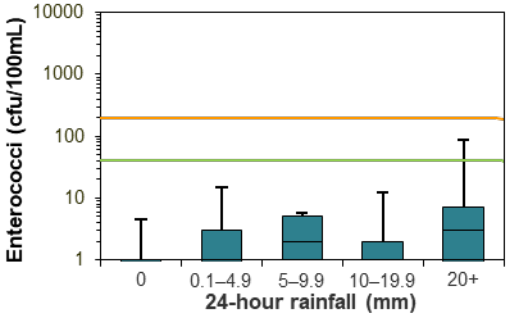
Microbial Assessment Category: A



Dry and wet weather water quality



Water quality in response to rainfall



Shaws Bay North

Beach grade: P

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

Shaws Bay North is located on the northern side of Shaws Bay, an inlet near the mouth of the Richmond River.

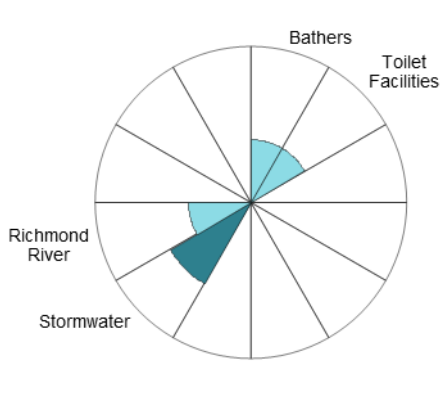
The Beach Suitability Grade of Poor indicates microbial water quality is susceptible to faecal pollution, particularly after rainfall and often during dry weather conditions, with potential faecal contamination from within the lake.

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

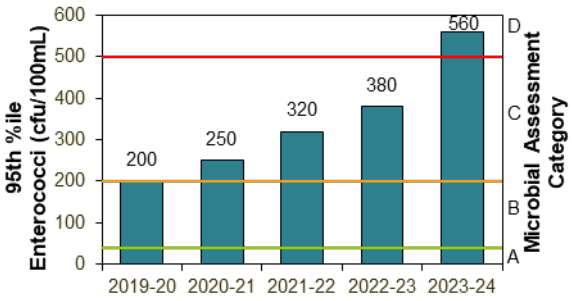
The site was monitored from 2002 until 2009, and since 2012.

Site type	Assessment period	Dry weather samples suitable for swimming	Water samples	Beach grade status
Estuarine	Nov 2019 to Feb 2024	67%	89	Stable

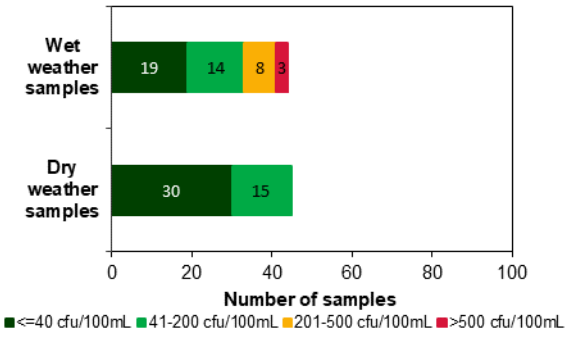
Sanitary inspection: Moderate



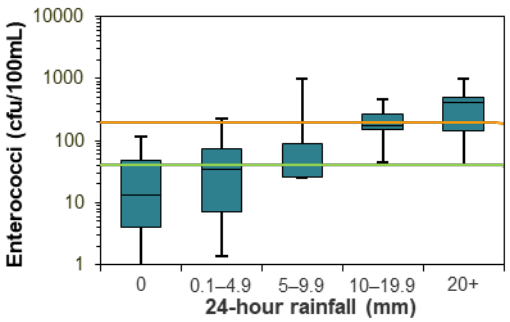
Microbial Assessment Category: D



Dry and wet weather water quality

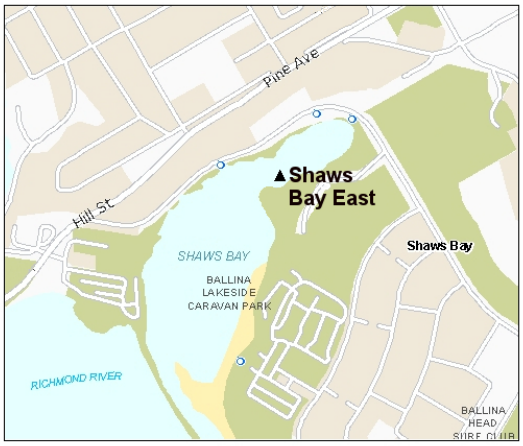


Water quality in response to rainfall



Shaws Bay East

Beach grade: P



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

Shaws Bay East is located on the eastern side of Shaws Bay, an inlet near the mouth of the Richmond River.

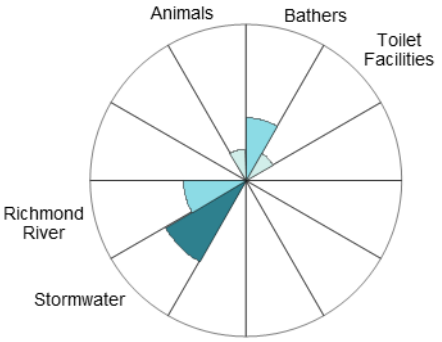
The Beach Suitability Grade of Poor indicates microbial water quality is susceptible to faecal pollution, particularly after rainfall and often during dry weather conditions, with potential faecal contamination from stormwater.

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

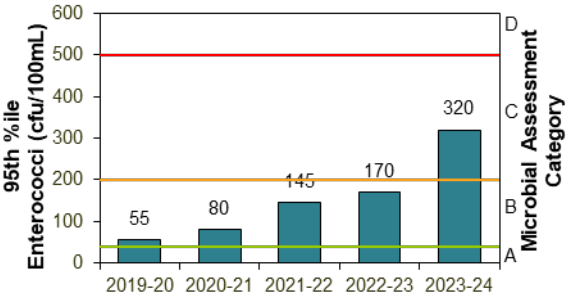
The site has been monitored since 2002.

Site type	Assessment period	Dry weather samples suitable for swimming	Water samples	Beach grade status
Estuarine	Nov 2019 to Feb 2024	76%	89	Declined ↓

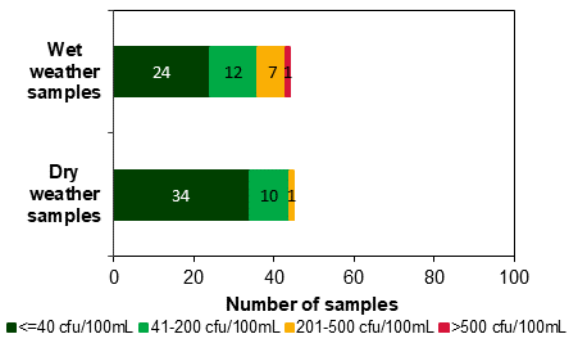
Sanitary inspection: Moderate



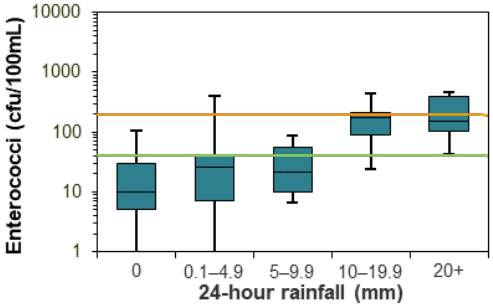
Microbial Assessment Category: C



Dry and wet weather water quality

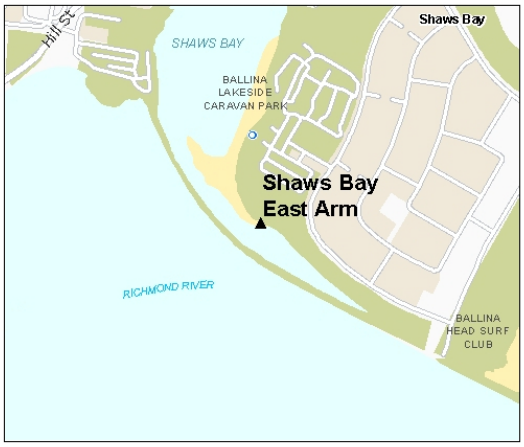


Water quality in response to rainfall



Shaws Bay East Arm

Beach grade: G



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

Shaws Bay East Arm is a sandy beach located on the southern side of Shaws Bay, an inlet near the mouth of the Richmond River.

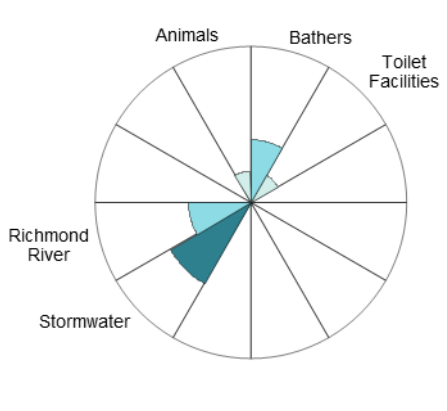
The Beach Suitability Grade of Good indicates microbial water quality is considered suitable for swimming most of the time but can be susceptible to pollution after rain, with several potential sources of faecal contamination including stormwater.

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

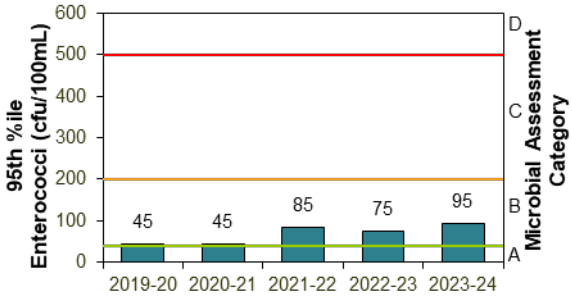
The site has been monitored since 2014.

Site type	Assessment period	Dry weather samples suitable for swimming	Water samples	Beach grade status
Estuarine	Nov 2019 to Feb 2024	96%	97	Stable

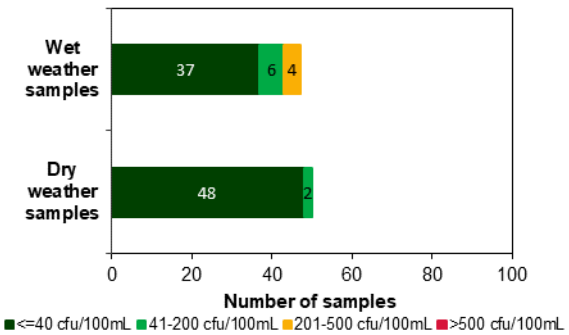
Sanitary inspection: Moderate



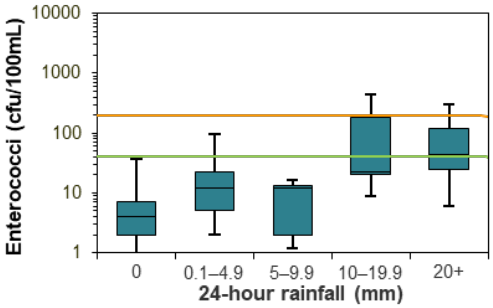
Microbial Assessment Category: B



Dry and wet weather water quality



Water quality in response to rainfall



Shaws Bay East Beach

Beach grade: G

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

Shaws Bay East Beach is a sandy beach located on the eastern side of Shaws Bay, an inlet near the mouth of the Richmond River.

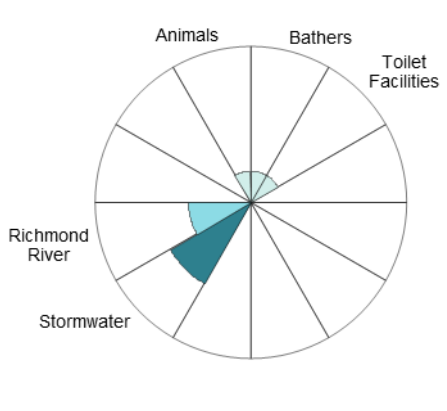
The Beach Suitability Grade of Good indicates microbial water quality is considered suitable for swimming most of the time but can be susceptible to pollution after rain, with several potential sources of faecal contamination including stormwater.

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

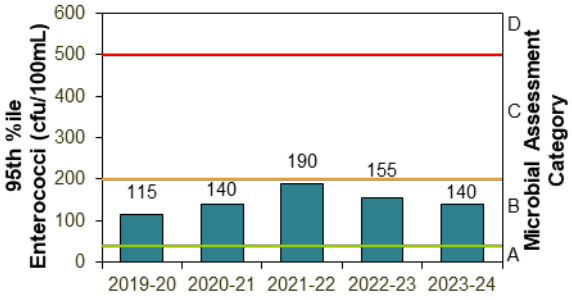
The site has been monitored since 2014.

Site type	Assessment period	Dry weather samples suitable for swimming	Water samples	Beach grade status
Estuarine	Nov 2019 to Feb 2024	98%	89	Stable

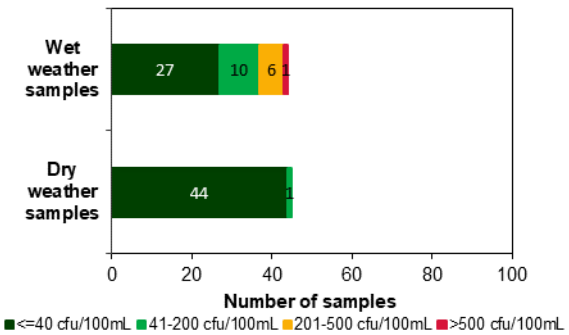
Sanitary inspection: Moderate



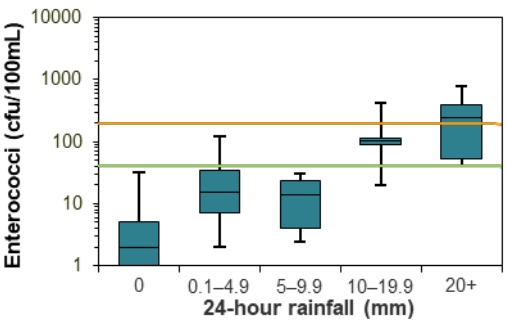
Microbial Assessment Category: B



Dry and wet weather water quality



Water quality in response to rainfall



Shaws Bay West

Beach grade: P

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

Shaws Bay West is located on the western side of Shaws Bay, an inlet near the mouth of the Richmond River.

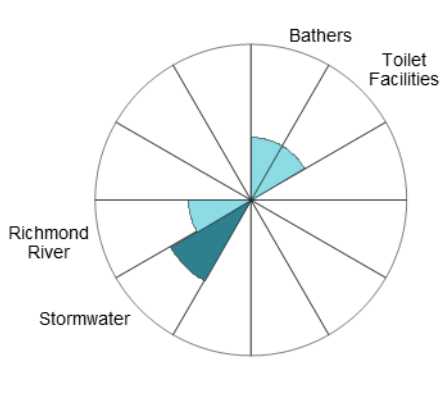
The Beach Suitability Grade of Poor indicates microbial water quality is susceptible to faecal pollution, particularly after rainfall and occasionally during dry weather conditions, with potential faecal contamination from stormwater and elsewhere within the lake.

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

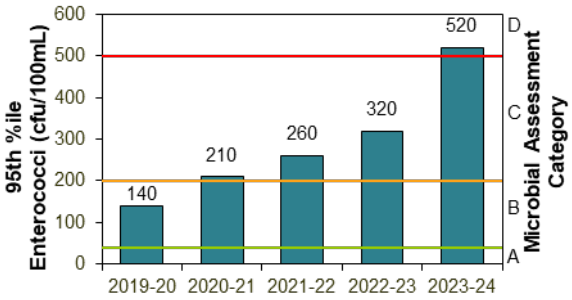
The site was monitored from 2002 until 2009, and since 2012.

Site type	Assessment period	Dry weather samples suitable for swimming	Water samples	Beach grade status
Estuarine	Nov 2019 to Feb 2024	75%	98	Stable

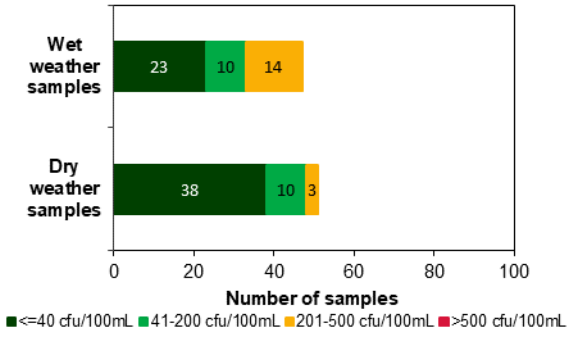
Sanitary inspection: Moderate



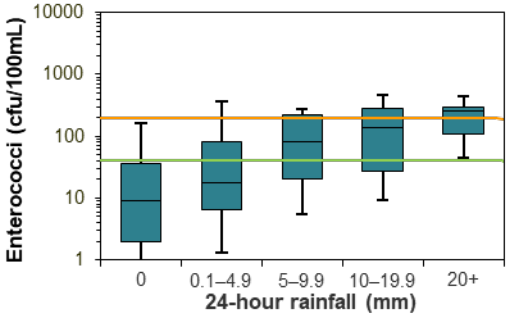
Microbial Assessment Category: D



Dry and wet weather water quality

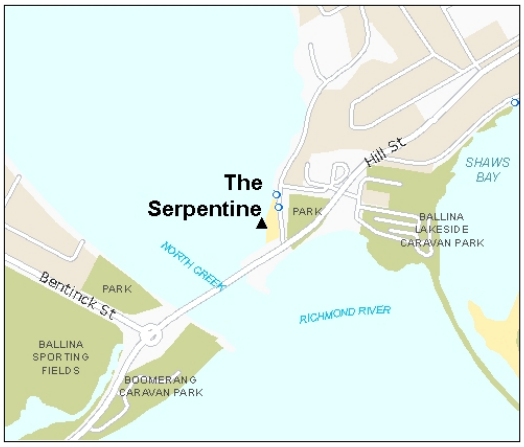


Water quality in response to rainfall



The Serpentine

Beach grade: G



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

The Serpentine is adjacent to Missingham Bridge in North Creek, a tributary of the Richmond River.

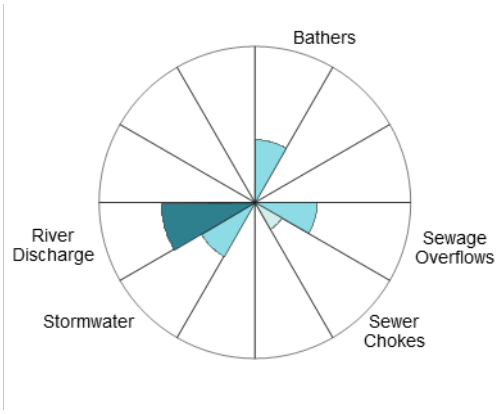
The Beach Suitability Grade of Good indicates microbial water quality is considered suitable for swimming most of the time but may be susceptible to pollution after rain, with several potential sources of faecal contamination including upstream river sources.

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

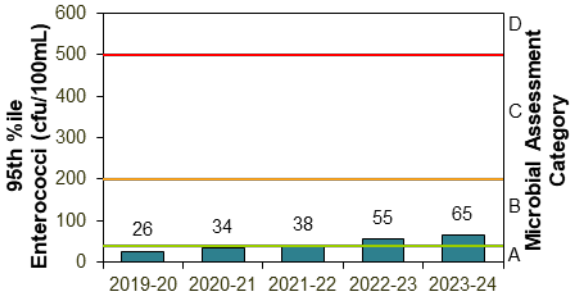
This site has been monitored since 2002.

Site type	Assessment period	Dry weather samples suitable for swimming	Water samples	Beach grade status
Estuarine	Nov 2019 to Feb 2024	96%	98	Stable

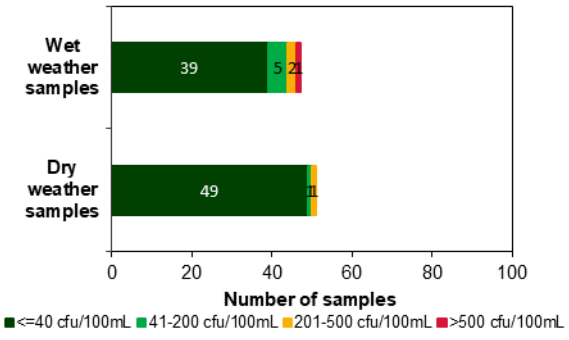
Sanitary inspection: Moderate



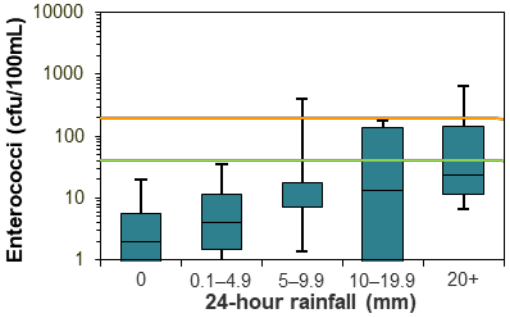
Microbial Assessment Category: B



Dry and wet weather water quality



Water quality in response to rainfall



Missingham Beach

Beach grade: P

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

Missingham Beach is a sandy beach located on the northern side of the Richmond River, adjacent to Missingham Park.

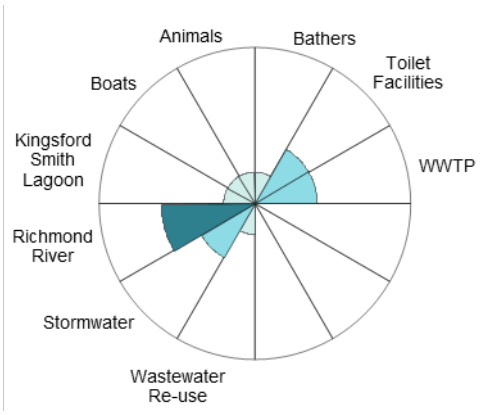
The Beach Suitability Grade of Poor indicates microbial water quality is susceptible to faecal pollution, particularly after rainfall and occasionally during dry weather conditions, with several potential sources of faecal contamination including upstream river sources.

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

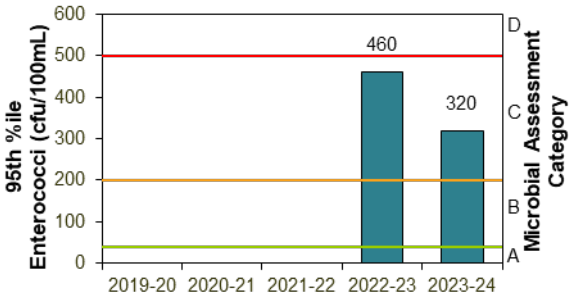
This site has been monitored since 2022.

Site type	Assessment period	Dry weather samples suitable for swimming	Water samples	Beach grade status
Estuarine	Nov 2022 to Feb 2024	71%	40	Stable

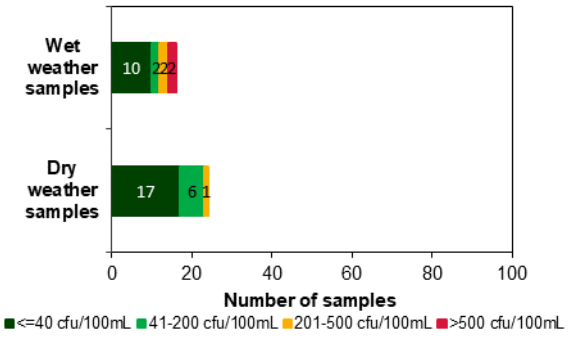
Sanitary inspection: Moderate



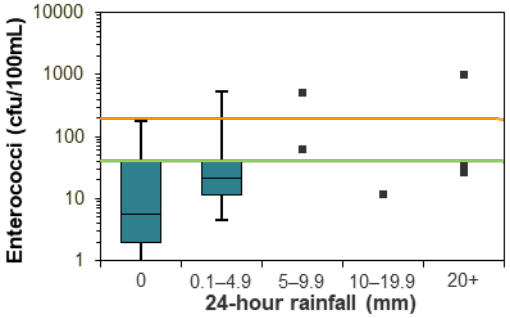
Microbial Assessment Category: C



Dry and wet weather water quality



Water quality in response to rainfall



Richmond Valley Council

100%
ocean beaches graded Good or Very Good

Overall results

Three of the 5 swimming sites were graded as Very Good or Good in 2023–2024. This is a similar performance to the previous year.

Percentage of sites graded as Very Good or Good

	2021–2022	2022–2023	2023–2024	Trend
Ocean beaches (3 sites)	100%	**100%**	**100%**	
Estuarine sites (2 sites)	50%	**0%**	**0%**	

Five swimming sites were monitored by Richmond Valley Council. All sampling and laboratory analysis was fully funded by the council. The 3 ocean beaches and Elm Street Bridge North were sampled weekly from October to March. Evans River is sampled weekly throughout the year.

See the section on **How to read this report** on page 35 for an explanation of the graphs, tables and Beach Suitability Grades.

Best beaches

Shark Bay.

This site had excellent water quality and was suitable for swimming almost all of the time.

Swimming sites monitored in the Richmond Valley Council region include ocean beaches and estuarine areas in Evans River, with each site type having a different response to rainfall-related impacts.

Site types in Richmond Valley Council

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

As a general precaution swimming should be avoided during and for at least one day after heavy rain at ocean beaches, and for up to 3 days in estuarine areas, or if there are signs of stormwater pollution such as discoloured water or floating debris.

Ocean beaches

Beach Suitability Grades for Richmond Valley Council ocean beaches

Shark Bay was graded as Very Good in 2023–2024. Water quality at this beach has been consistently excellent for many years and is suitable for swimming almost all of the time.

Airforce Beach and Main Beach continued to be graded as Good in 2023–2024, a similar result to previous years. While water quality at these beaches was suitable for swimming most of the time, elevated enterococci results were occasionally recorded in dry and wet weather conditions.

Estuarine beaches

Beach Suitability Grades for Richmond Valley Council estuarine beaches

Evans River and Elm Street Bridge North continued to be graded as Poor in 2023–2024. Elevated bacterial levels were recorded in dry weather and were regularly elevated during and following moderate to heavy rainfall. Despite this, water quality was mostly suitable for swimming during dry weather, with 69% and 75% of dry weather samples within the safe swimming limit at Evans River and Elm Street Bridge respectively.

Water quality results at the Evans River swim sites were heavily influenced by wet weather impacts, with close to

half of the samples in this year's assessment period collected during wet weather conditions.

It is recommended that swimming should be avoided during and for up to 3 days following rainfall or if there are signs of stormwater pollution such as discoloured water or floating debris.

Sampling sites and Beach Suitability Grades in Richmond Valley Council

Airforce Beach

Beach grade: G

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

Airforce Beach is located on a 31 km stretch of beach and is not patrolled by lifeguards.

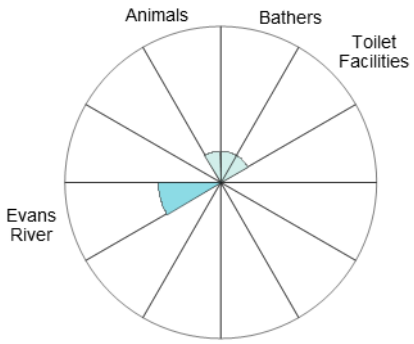
The Beach Suitability Grade of Good indicates microbial water quality is considered suitable for swimming most of the time but may be susceptible to pollution after rain, from several potential sources of faecal contamination including stormwater.

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

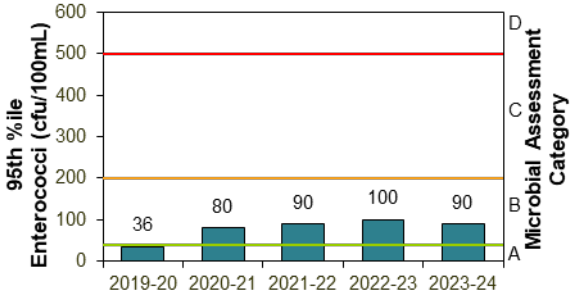
The site has been monitored since 2006.

Site type	Assessment period	Dry weather samples suitable for swimming	Water samples	Beach grade status
Ocean beach	Jun 2020 to Mar 2024	87%	100	Stable

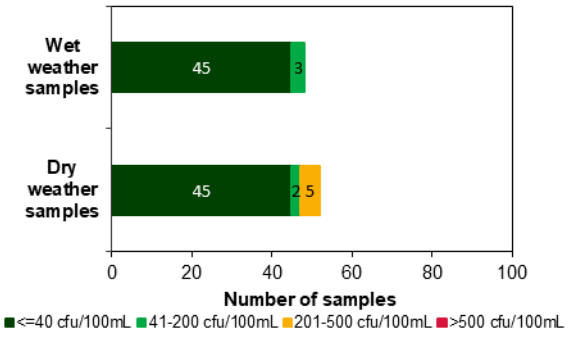
Sanitary inspection: Low



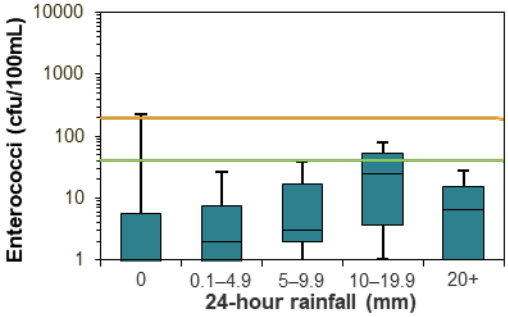
Microbial Assessment Category: B



Dry and wet weather water quality



Water quality in response to rainfall



Main Beach

Beach grade: G

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

Main Beach is located at the southern end of a 31 km stretch of beach and is patrolled during holiday periods.

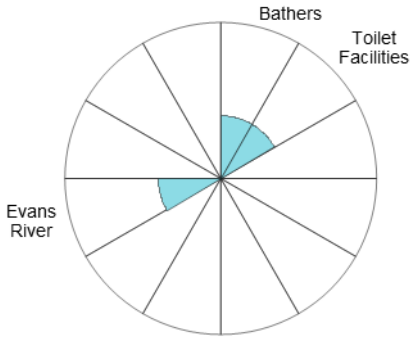
The Beach Suitability Grade of Good indicates microbial water quality is considered suitable for swimming most of the time but may be susceptible to pollution after rain, from several potential sources of faecal contamination including stormwater.

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

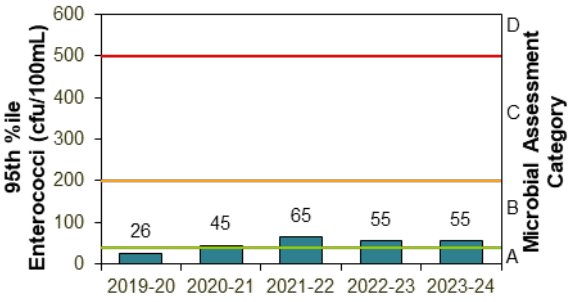
The site has been monitored since 2006.

Site type	Assessment period	Dry weather samples suitable for swimming	Water samples	Beach grade status
Ocean beach	Jun 2020 to Mar 2024	90%	100	Stable

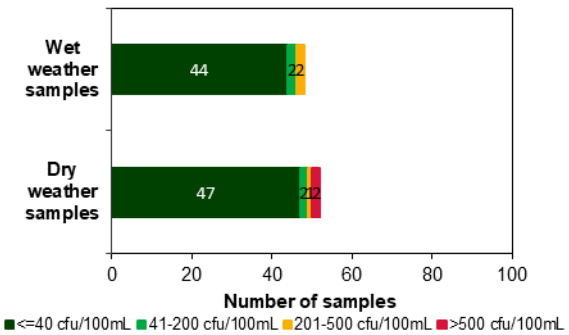
Sanitary inspection: Low



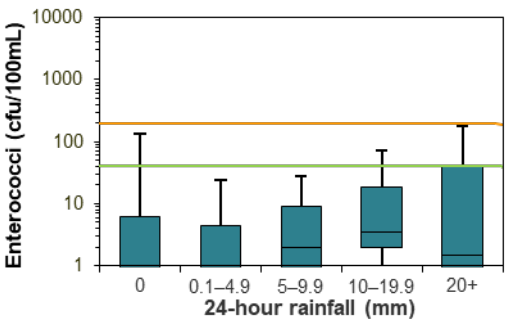
Microbial Assessment Category: B



Dry and wet weather water quality



Water quality in response to rainfall



Shark Bay

Beach grade: VG

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

Shark Bay is a small beach located between the southern entrance wall to the Evans River and the cliffs below Razorback Lookout and is not patrolled by lifeguards.

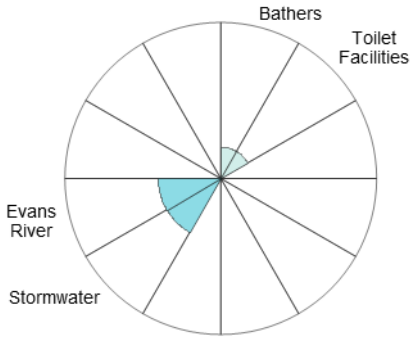
The Beach Suitability Grade of Very Good indicates microbial water quality is considered suitable for swimming almost all of the time, with few potential sources of faecal contamination.

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

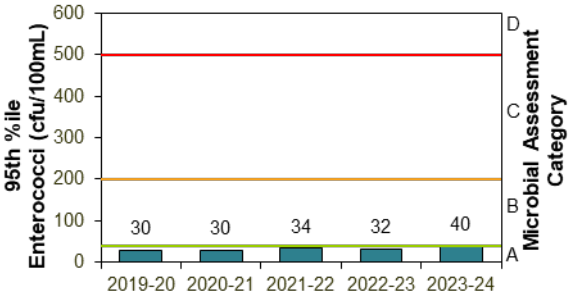
The site has been monitored since 2006.

Site type	Assessment period	Dry weather samples suitable for swimming	Water samples	Beach grade status
Ocean beach	Mar 2020 to Mar 2024	92%	100	Stable

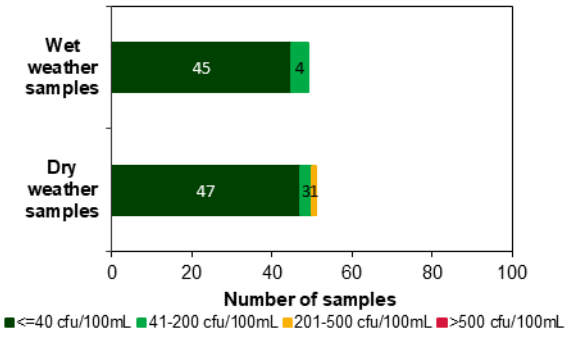
Sanitary inspection: Low



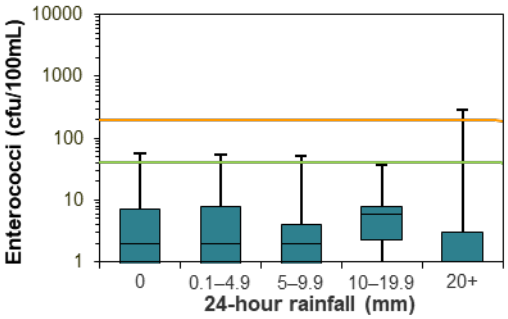
Microbial Assessment Category: A



Dry and wet weather water quality

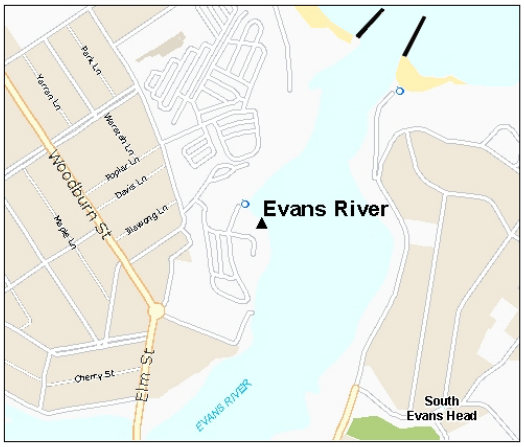


Water quality in response to rainfall



Evans River

Beach grade: P



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

Evans River sampling site is located upstream of the river mouth and near the caravan park.

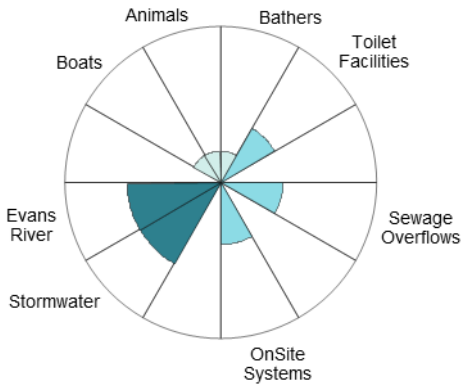
The Beach Suitability Grade of Poor indicates microbial water quality is susceptible to faecal pollution, particularly after rainfall and occasionally during dry weather conditions, with potential faecal contamination from upstream river sources and stormwater.

Enterococci levels increased with increasing rainfall, often exceeding the safe swimming limit after no rain, and regularly in response to rain.

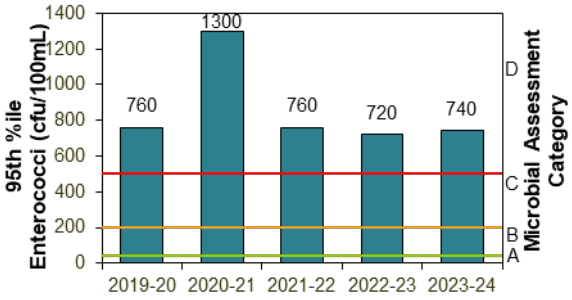
The site has been monitored since 2006.

Site type	Assessment period	Dry weather samples suitable for swimming	Water samples	Beach grade status
Estuarine	May 2022 to Apr 2024	69%	100	Stable

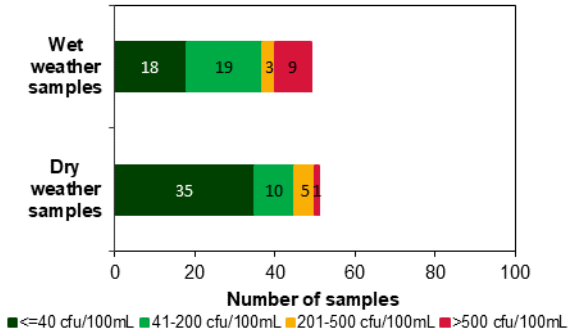
Sanitary inspection: Moderate



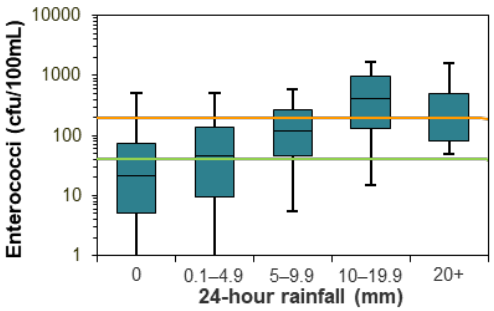
Microbial Assessment Category: D



Dry and wet weather water quality

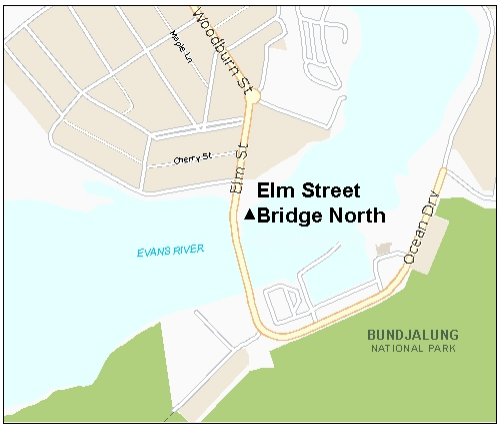


Water quality in response to rainfall



Elm Street Bridge North

Beach grade: P



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

Elm Street Bridge North (Evans River) is located on the eastern side of Elm Street Bridge in the Evans River.

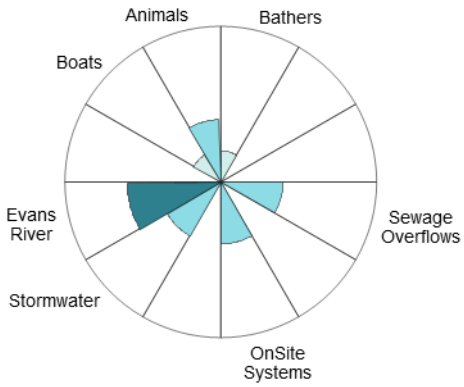
The Beach Suitability Grade of Poor indicates microbial water quality is considered suitable for swimming most of the time but may be susceptible to pollution after rain, with several potential sources of faecal contamination including upstream river sources.

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

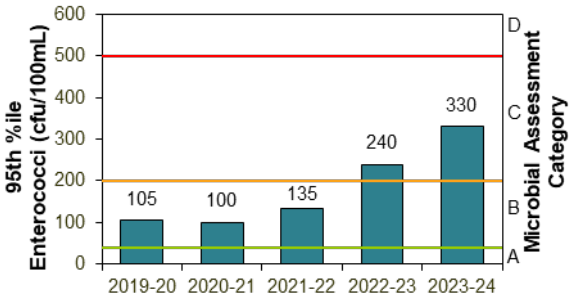
The site has been monitored since 2015.

Site type	Assessment period	Dry weather samples suitable for swimming	Water samples	Beach grade status
Estuarine	Oct 2020 to Mar 2024	75%	100	Stable

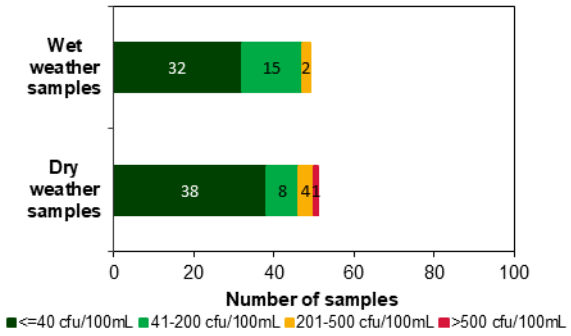
Sanitary inspection: Moderate



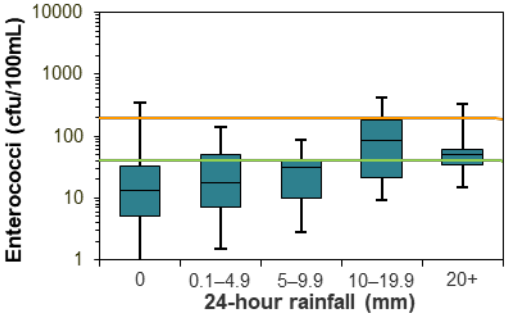
Microbial Assessment Category: C



Dry and wet weather water quality



Water quality in response to rainfall



How to read this report

Beach Suitability Grades

Beach Suitability Grades provide an assessment of the suitability of a swimming location for recreation over time and are based on a combination of sanitary inspection (identification and rating of potential pollution sources at a beach) and microbial assessment (water quality measurements gathered over previous years). There are 5 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 3 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 3 days following rainfall or if there are signs of pollution such as discoloured water or odour or debris in the water

Some 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 the catchment.

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 3 days following rainfall

VP Very Poor

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

Follow Up

Sometimes a location's sanitary inspection and water quality data produce incongruent results. These locations are classified as 'Follow Up'. Further assessment will be required to obtain the necessary data to provide a definite classification in accordance with national guidelines.

The guidelines

The National Health and Medical Research Council's guidelines for managing risks in recreational water (NHMRC 2008) 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 (WA Department of Health 2007).

Enterococci

The national guidelines advocate the use of enterococci as the single preferred faecal indicator in recreational 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 (Standards Australia 2007).

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

Beach Suitability Grades are determined by using the following matrix:

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

* Follow up occurs when sanitary inspection and water quality data produce potentially incongruent results; further assessment will be required.

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

Microbial Assessment Category (MAC)

There are 4 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 (Wyer et al. 1999).

Risk of illness associated with Microbial Assessment Categories

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

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

Calculating the MAC

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

The 95th percentile values for each of the 4 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. The WA Department of Health recommends a minimum of 65 samples, collected from a particular site over 5 consecutive years, to provide sufficient confidence and reliability in the 95th percentile data output. This tool has been used to calculate the 95th percentile values

presented in this report and has been adopted for use by other state governments in Australia.

The tool can be downloaded from the WA Government's 'Environmental waters publications' webpage, under *Forms and templates*.

Sanitary Inspection Category (SIC)

More information about the **sanitary inspection** process is available in the Beachwatch Protocol for assessment and management of microbial risks in recreational waters, found on the department's website.

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

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

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

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

Stormwater drain flow

Photo: Beachwatch/DCCEEW

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

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

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

Explanation of tables

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

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

○ Stable

▲ Improved

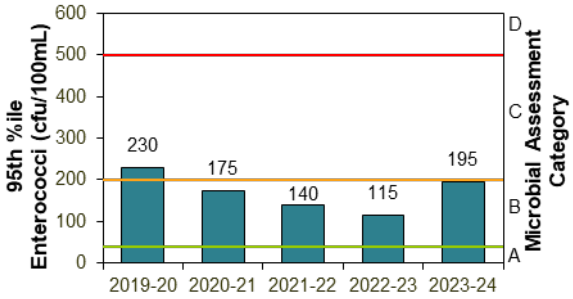
▼ Declined

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

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

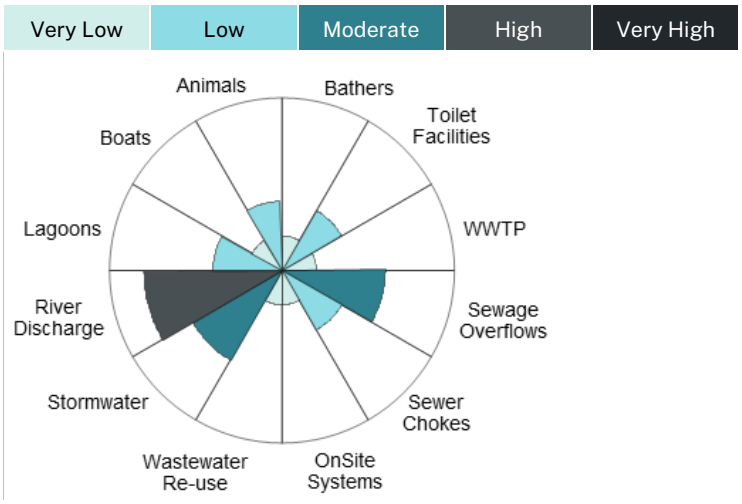
Microbial Assessment Category (MAC) chart

On each beach page, the MACs for the last 5 years are displayed on a simple bar chart. The MAC for the current year is based on enterococci data collected during the assessment period. The bars are labelled with the 95th percentile value for each year and the thresholds dividing the A, B, C and D categories are marked in green, amber and red for reference.



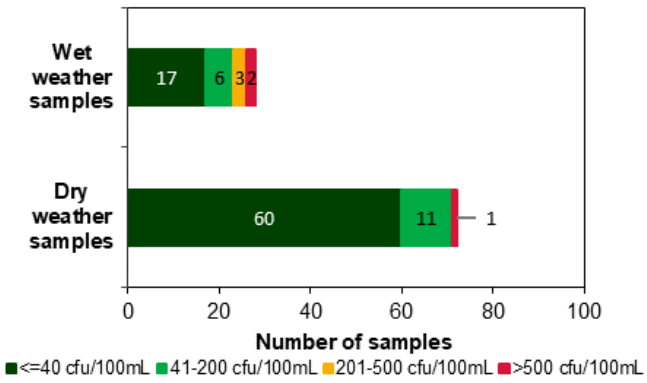
Sanitary Inspection Category (SIC) chart

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



Wet and dry weather water quality chart

Enterococci levels in wet and dry weather conditions are presented for each swimming location as a bar graph. All data collected during the assessment period is included in the analysis. Dry weather is defined as no rainfall recorded in the previous 24 hours. Each bar is colour coded to show the number of enterococci results up to 40 cfu/100 mL, between 41 and 200 cfu/100 mL, between 201 and 500 cfu/100 mL and greater than 500 cfu/100 mL. These categories reflect the Microbial Assessment Category thresholds and are coloured on the graph as dark green, light green, amber and red respectively.

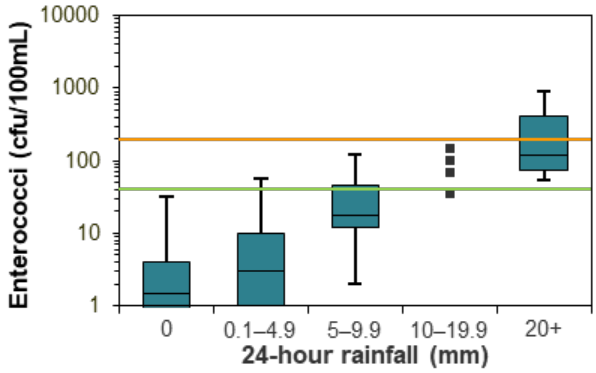


It is expected that swimming sites with lower levels of flushing will show some elevated bacterial results in dry weather samples (no rainfall in the previous 24 hours) due to the longer time needed to recover from a rainfall event. At some estuarine and lake/lagoon swimming locations the impacts of stormwater pollution on beach water quality may be detected up to 3 days after rainfall.

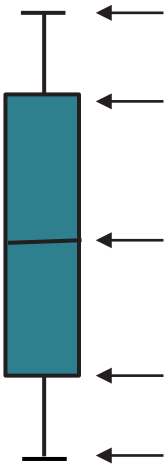
Water quality in response to rainfall

Trends in enterococci levels in response to rainfall are shown using a box plot. For reference, enterococci levels of 40 cfu/100 mL and 200 cfu/100 mL are indicated with a green and orange line, respectively. The 40 cfu/100 mL level is referred to as the ‘safe swimming limit’. The enterococci data were obtained from the last 5 years of monitoring. Rainfall data were obtained from rain gauges situated close to the sample site and are 24-hour totals to 9 am on the day of sampling. If there are fewer than 5 enterococci data points in a rainfall category, individual data points are presented instead of a box plot. At sites

where many results are below the detection limit (1 cfu/100 mL), only the upper portion of the box plots will be visible.



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



95% of the samples lie below the top whisker

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

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

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

5% of the samples lie below the bottom whisker.

Information bars

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

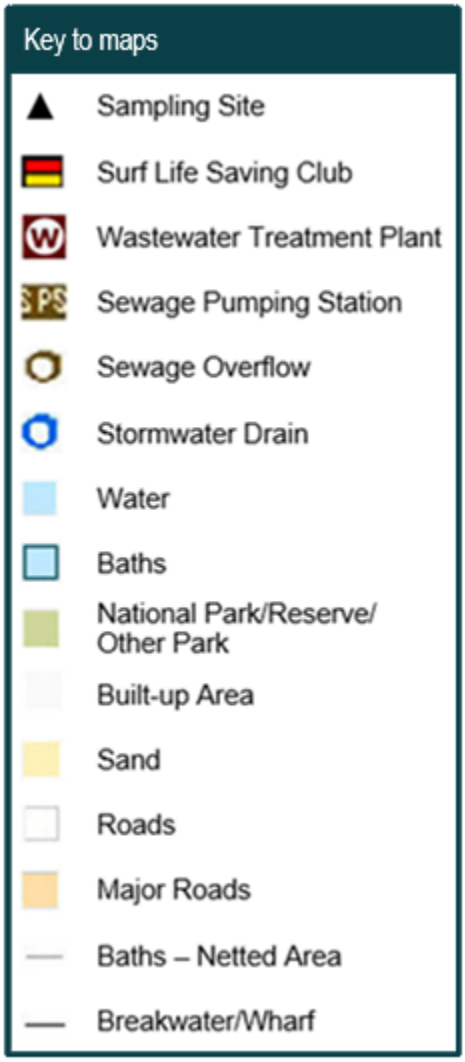
The **assessment period** shows the timeframe in which the water samples were collected. The NHMRC guidelines state beach grades should be determined from the most recent 100 water quality results collected within a 5-year period. The assessment period varies between sites depending on sampling frequency.

Dry weather samples suitable for swimming (**dry weather swimmability**) shows the percentage of water samples with enterococci levels below 40 cfu/100 mL. Dry weather is defined as no rainfall in the previous 24 hours.

Swimming sites with lower levels of flushing often have a lower percentage of dry weather samples within the safe swimming limit due to the impacts of rainfall detected up to 3 days after the event.

Explanation of maps

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



References

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

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

WA Department of Health (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, ww2.health.wa.gov.au/Articles/A_E/Environmental-waters-publications, accessed 23/06/23.

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):715–722.

More information

- Beachwatch webpage
- Coastal management program progress
- Sanitary inspection of beaches
- WA Government environmental water publications
- Ballina Shire Council's Healthy Waterways program
- Ballina Shire Council Coast and Estuary Management
- Richmond Valley Council Beachwatch program