



Terrigal Catchment Audit



Summary of the initial water quality report

The Terrigal Catchment Audit is a comprehensive program being undertaken in partnership between Council and the NSW Government. The objectives of the program are to identify and address possible sources of pollution within the Terrigal Catchment and better understand their impacts on long term water quality at the Beach, Lagoon and Haven.

The audit, which commenced in January 2019, aims to assess microbial contamination as an indicator of risk to swim safety, investigate possible contamination sources and develop a water quality improvement program.

The initial audit addressed in this summary establishes a robust monitoring program at 12 locations - six along Terrigal Beach, four along Terrigal Haven, one in the rockpool and one in Terrigal Lagoon, stretching from the lagoon to the "7 drains" (Referenced as T3-T9 in the below diagram).

Samples are taken from the stormwater pipes that discharge to the beach, and are paired with adjacent ocean samples to assess the impact of stormwater on ocean microbial contamination.

These samples have been assessed and reported in both the full report and this summary report. The initial audit period includes results from January to May 2019 with reference to a single more recent wet weather event in June 2019.

Poor water quality in urban areas is not a new phenomenon and is a common issue in both developed and developing countries. There are a number of possible sources of microbial contamination at any beach, estuary and lagoon environment, and these may directly affect water quality in the ocean. Microbial pollutants may enter the environment from point or diffuse sources, or may be latent in the system.

In urban waterways, microbial pollutants may arise from a range of different sources including domestic and wild animals, discharge from boats, bather shedding and beach showers, private and public toilet facilities, sewer overflows or discharges, sewer chokes, cross contamination of damaged sewer and stormwater infrastructure, on-site sewer management, contaminated groundwater, organic fertilisers, seaweed and sediment reservoirs or proximity to nearby waterways (e.g. rivers or lagoons).

Sewer overflows can occur on private land or from Council systems as a result of blackouts affecting private and Council pump stations, sewer pipe infiltration from groundwater, illegal connections from private buildings and blockages caused by flushed sanitary items or rubbish, tree roots, sediment and debris.

Contamination may be caused by damaged Council or private underground sewer pipes or illegal connections from private sewer to stormwater, private septic systems or pump stations which are managed or serviced incorrectly.



Outcomes from the initial audit indicate:

- Terrigal Beach and Terrigal Haven were rated as "Good" for swimming 94% and 84% of the time during dry and wet weather respectively.
- Dry weather flows were found to have some degree of microbial contamination at all stormwater pipes discharging to the beach, however this contamination varied and did not correspond to elevated results at the paired ocean locations (the beach) with minimal risk to swim safety associated with dry weather flows from stormwater drains. This is likely a result of low discharge volumes and effective dilution with ocean waters (seen in map 2).
- A number of pipes in the Terrigal Beach and Terrigal Haven catchment areas have been placed on a works program for upgrade after being identified as being in poor condition following CCTV inspection of stormwater and sewer networks.
- Council recommends people do not swim within three days of rainfall at Terrigal Beach due to the identified relationship between rainfall and microbial contamination. During wet weather, the ocean sites adjacent to the stormwater drains at Terrigal Beach T3-T9 ("7 drains") showed an increase in microbial contamination (seen in map 3).
- Lagoon openings, which often coincide with rainfall events, increased the likelihood of beach microbial contamination seen in map 4. Large rainfall events and their associated impacts particularly caused microbial contamination seen in map 5.
- Heavy rainfall in the Terrigal area on the 24 June resulted in the opening of the Lagoon which contributed to poor water quality, however testing shows this was not the sole source of pollution seen in map 5. Investigations for this stormwater pollution event are ongoing.

Infrastructure investigations

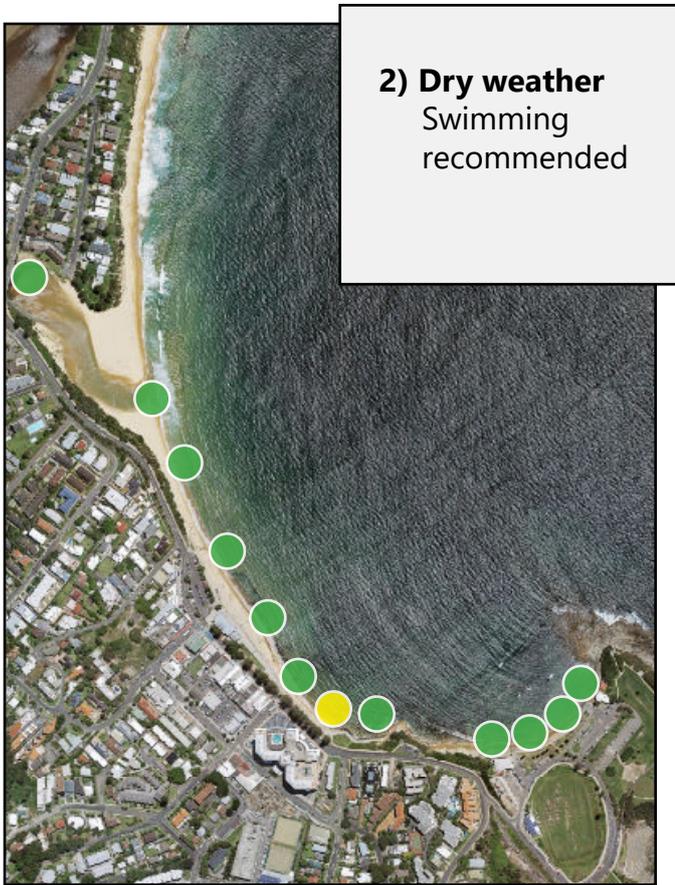
Regardless of initial results which indicated minimal to no impact on recreational swim safety, catchment water quality and infrastructure investigations continue to be undertaken to assess potential sources of microbial contamination; and where possible, reduce the likelihood of cross-contamination between sewer and stormwater networks.

A number of pipes in the Terrigal Beach and Terrigal Haven catchment areas have been placed on a works program for upgrade after being identified as being in poor condition following CCTV inspection of stormwater and sewer networks. These pipes did not noticeably increase beach microbial presence throughout paired pipe and ocean sampling, however they will be upgraded to ensure contamination cannot occur.

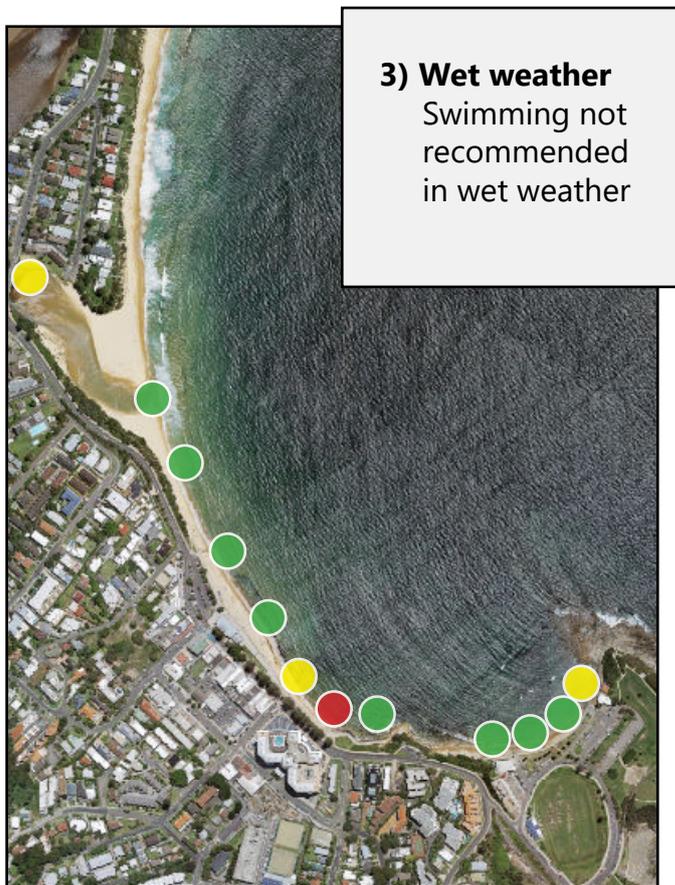
Investigations assessing private and Council infrastructure are ongoing in both stormwater and sewer networks in dry and wet weather.

Colour code

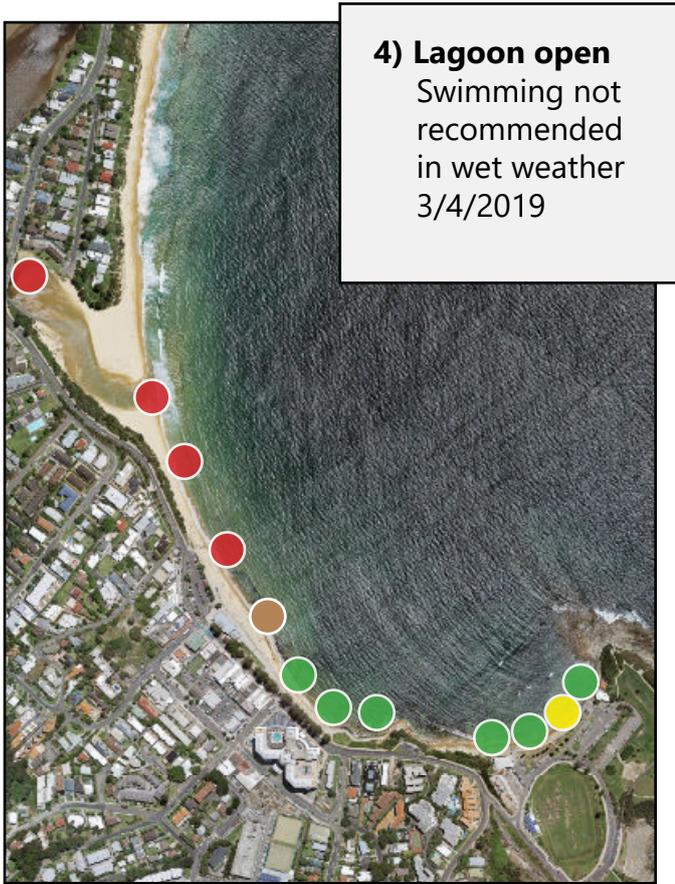
- **Good**
- **Fair**
- **Poor**
- **Bad**



2) Dry weather
Swimming recommended



3) Wet weather
Swimming not recommended in wet weather



4) Lagoon open
Swimming not recommended in wet weather 3/4/2019



5) Large rainfall event
Swimming not recommended in wet weather 24/6/2019

Initial outcomes of the Terrigal Catchment Audit are based on a small sample size of 20 days between January and May 2019, with continuing investigations potentially finding new and unpredicted results which may change the outcomes of the audit. Although minimal to no risk to swim safety from stormwater pipes in dry weather has been detected in the initial audit, further data may prove this outcome to be incorrect.

Council is continuing to sample and assess the water quality at Terrigal Beach and Terrigal Haven to build a detailed understanding of the system and water quality under different conditions.



Future works

After the initial audit, which focussed primarily on microbial contamination to assess swim safety, the program will progress to the major audit undertaken in partnership with the NSW Government and Central Coast Council. The major audit will;

- Assess hydrological mechanisms driving microbial movement in Terrigal Beach and Haven, including an assessment of the offshore zone where swimmers cross to Terrigal Haven.
- Assess the effect of reduced flushing on water quality at Terrigal Haven and the Marine Rescue Boat Ramp.
- Assess volume and load of pollution hotspots within the catchment including assessment of microbial contamination and other environmental impacts from stormwater. This information will feed into the water quality improvement program.
- Conduct comprehensive sampling at Terrigal Lagoon to assess pollution hotspots to assist the water quality improvement program,
- Assess the impact of lagoon openings on beach water quality.
- Investigate the impacts of large wet weather events on water quality.

Together, Council and the NSW Government are addressing these issues, and will report back to the community as a part of the major audit. The process is complex, and will take time to work through to ensure we fully understand the drivers of water quality, and are able to target future investment wisely

What you can do

It is the cumulative effect of our daily activities that has the greatest effect on water quality. The pollution from each household or business may seem insignificant, but multiplied by thousands of households and businesses, the concentration of pollution reaching our waterways quickly magnifies. You can:

- Pick up litter and pick up after pets.
- Check your plumbing. Do you have an illegal connection? Check that your gutters and drainage do not go to the sewer system, as rainwater can overload the sewer and cause sewage overflows which may reach the beach.
- Only ever flush the 'three P's' down your toilet – 'Poo, Pee and Paper', everything else needs to go in the appropriate bin.
- If you experience water or sewerage concerns we have crews on standby 24 hours a day, 365 days a year so please call Council immediately – day or night – on **1300 463 954**.
- Visit Council's website to read our Frequently Asked Questions.



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