the state of our environment

Published by Gisborne District Council

Gisborne 2009 and 2010

The Coastal environment

Principal findings

- The new wastewater treatment plant was commissioned on time and under budget
- The Wainui Stream study used advanced technology to investigate pollution sources
- Some coastal and marine water samples failed quality testing at times when there was sediment and debris in the water, and following significant rainfall; this was as expected
- Gisborne surf breaks are enshrined in the revised Coastal Policy statement

What is water quality?

From an environmental perspective, quality water meets the aesthetic, recreational and human health requirements of a community. Contamination of water by faecal matter, whether animal or human in origin, is of serious concern for water quality. Marine and coastal waters are sampled by Gisborne District Council staff at 25 sites, and samples are assessed against guidelines depending on the type of use that occurs there – whether bathing and recreation or shellfish gathering. Popular recreation areas are sampled weekly throughout the summer season when use is the greatest, and those that are used throughout the year (for instance surf breaks) are monitored fortnightly throughout the remainder of the year.

Water samples are tested for faecal coliforms – bacteria present in the intestinal tract of both humans and animals. Faecal coliforms are considered indicator organisims, as their presence may mean that other more serious pathogens are also present in the water. Every year there are some samples of marine and coastal water that contain excessive amounts of bacteria, and the typical reason for this is when sampling coincides with a period of significant rain, which we know washes sediment, and with it bacteria , into the sea. However, some exceedences are not the result of rainfall, and in these cases the Environmental Health section of Council investigates possible sources of contamination.

Marine and coastal recreational water quality

Of 1,016 coastal and marine water samples taken during 2009 and 2010, 52 samples exceeded first alert level (that is, they contained *enterococci* counts of between 140 and 280 bacteria per 100ml of water) and 116 exceeded the second alert level (*enterococci* counts greater than 280/100ml).

The samples were taken from twenty-six sites, of which twenty four provided one or more samples that exceeded quality guidelines at some time, mostly directly linked to periods of significant rainfall at sites known from past monitoring history to be rain-affected.

Sites where exceedences were recorded that were not directly caused by rainfall included Waipiro Bay and Tokomaru Bay (in December 2010), both Anaura Bay and Tolaga Bay (at the end of Wharf Road) in January of both years, Turihaua Beach (in January 2009 and November 2010), Makorori Beach settlement (in January and February 2009), Waikanae Beach opposite the Surf Club (six exceedences in February 2009, March and December 2010), and Midway Beach opposite the Surf Club (five exceedences in February 2009, March, November and December 2010).

Very rough sea conditions along the whole East Coast in February 2010 in fact caused one entire run of samples to show higher then usual bacterial counts.

The multiple exceedences at Midway Beach were believed to have been the result of a large amount of very fine driftwood floating in the water, on two occasions compounded by high-impact wave action stirring up sediment. At Waikanae Beach exceedences were mainly attributable to contamination from the Turanganui River and possibly even large ships in the port agitating the water.

At the other sites, surveys revealed exceedences to be related to high bacterial counts in the rivers affecting the beaches.

Informing the public

Permanent or seasonal signage is located at water-quality sampling sites, and on access routes to shellfish gathering areas, to inform the public that water quality in the area is monitored. In rain-affected areas a warning is included that water quality may present increased risks to health for up to five days following heavy rain.

Wainui Stream study uses new technology to investigate pollution

Testing over many years has frequently detected high levels of faecal bacteria in the lower reaches of the Wainui Stream and its tributaries. Recent human health concerns led to Environmental Health staff initiating in 2010 a very detailed investigation into the source of the contamination.

New technology now exists to determine whether faecal coliform bacteria are of animal, bird or human origin. This is important to know, as the remedy for each type of contamination is very different.

New sophisticated tests, known as faecal source tracking (FST) tools, utilise DNA analysis of the bacteria, alongside very specific chemical analysis to detect molecules known as sterols, and are species-specific. Tests to detect traces of washing powders (which would implicate a septic or grey water source for the bacteria), oils and pesticides can also be added to the analysis. These tests are very expensive, however the results are so specific that in future it may be more useful to conduct fewer FST tests rather than a large number of the traditional types of tests for faecal indicator organisms.

Preliminary results for the Wainui Stream indicate the majority of faecal coliforms present are from ruminant grazers (cattle and sheep) within the catchment. However, there was also a minor component of coliforms from humans and birds (most likely ducks). These results demonstrate how useful FST testing is: management of bacterial contamination from stock would involve fencing stock out of streams and riparian planting, whereas the human-sourced bacteria may require an investigation of septic systems in the area.

The FST tests were conducted by ESR in Christchurch, and Council Environmental Health staff were successful in obtaining Envirolink funding for this project.

Some sites where the potential for water contamination is often present have permanent display signs warning people that the shellfish collected from the area are not safe to eat, for instance at the Peel Street Bridge over the Taruheru River, and Kaiti Beach at the Yacht club.

Temporary signage would also be placed at recreational sites to notify elevated risks if contamination not associated with rainfall is detected.

Information pamphlets are distributed to all visitor outlets including the Information Centre, and camping grounds.

People should be aware that at times when the sea is discoloured by sediment following heavy rain, the potential health risk to bathers is elevated. There is a risk of contamination always present at certain sites: Tokomaru Bay lagoon, Turihaua lagoon and Anaura Bay lagoon. The public is cautioned about swimming at these sites, which are not monitored for water quality.

Fuel spills in the marine environment

Council staff respond to fuel/oil spills in the marine environment under the Maritime Transport Act. Trained personnel attended six such incidents in the inner harbour in each of 2009 and 2010. In one case the port tug was used to agitate water on an outgoing tide in order to disperse diesel.

If a spill occurs, staff assess the situation and take appropriate action: monitoring and/or containment and cleanup of the area.

Gisborne's wastewater treatment plant: on time and under budget

It's all go. During 2009 the planning phase for Gisborne's new wastewater treatment plant concluded and 2010 saw a full year of construction. After years of discussion, debate and design, a panel of independent commissioners granted Gisborne District Council resource consent in June 2009 to begin construction on Council-owned land in Banks Street. Work began in November 2009 and the plant commenced operation in December 2010, receiving flows from the western interceptor pipe.

Initially the plant was costed at $80 million plus, a figure not acceptable to many people in Gisborne; neither was not having a plant at all. The project cost was reduced to $45M by relocating to the Banks Street site, and later to under $40M. The final cost was $39.5M.

Environmental effects

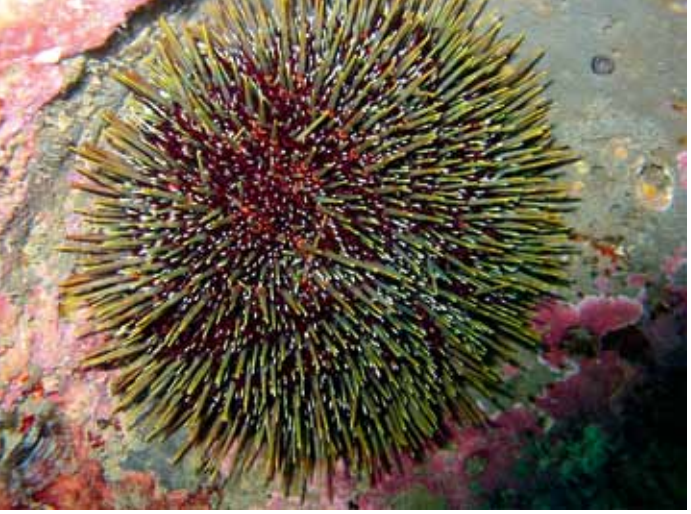
Included in the comprehensive suite of consent conditions were requirements to form a wastewater technical advisory group; prepare and implement an environmental management plan and construction management plan; provide landscaping in the first season after construction; and restrict noise to defined levels.

The only environmental impact of the plant during the construction stage was some surface run-off from the construction site, including the water involved in building the sub-surface stone columns. This was captured in settling ponds and passed through mesh screens before entering the Waikanae Creek.

The treatment process

The new plant uses a biological trickling filter system to transform fine wastewater solids into plant-like matter in a process known as biotransformation. Domestic wastewater is first screened by one of 2 rotating drum screens (one is on duty, one on standby) and then passed through a vortex grit removal chamber. Two more drum screens are used for industrial wastewater. The screenings and grit removed from these stages have the water pressed from them before being bagged and trucked to a landfill at Paeroa.

The screened and de-gritted wastewater is then pumped up through the central column of the biological filter, to a height of 8m. The wastewater is distributed via 6 rotating arms, and trickles slowly through 10 layers of plastic blocks. These provide the large surface area necessary for the biological transformation to take place. The treated wastewater is then pumped via a new outfall pump station to the existing marine outfall, 1.8km out to sea. We expect to report on improved water quality in the vicinity of the outfall from 2011 onwards.



Shellfish Sites

Two parameters are used to monitor the water quality at seven shellfish gathering sites, the seasonal median and maximum counts of faecal coliform bacteria per 100ml for 10% of the samples. Faecal coliforms are indicator organisms; their presence may indicate harmful bacteria, viruses or protozoa may also be present.

These are the same guidelines used by the shellfish export sector and are internationally accepted.

Only Pouawa complied with both monitoring criteria in 2009; Sponge Bay with just one. The remaining sites did not comply due mainly to rainfall carrying surface runoff.

In 2010 the Muriwai end of Wherowhero lagoon was non-complying and both Pouawa and Sponge Bay failed to meet one of the criteria. These results are similar to those recorded in previous years.

Gisborne surf breaks recognised

In December 2010, nineteen of New Zealand's leading surf spots were officially recognised and protected under the revised New Zealand Coastal Policy Statement.

The Policy's aims are to prevent inappropriate use and development that may adversely affect the use and enjoyment of nationally significant surf breaks.

In particular, the Policy refers to water quality, access, and or the placement of anything in or on the water that may hinder swell reaching the breaks in question. Protection for further unnamed surf breaks is also available, as local authorities and decision makers are required to preserve the 'natural character of the coastal environment', and 'surf breaks' are specifically identified as being capable of being part of this natural character.

The Gisborne surf breaks enshrined in the Policy are: Makorori Point – Centres; Wainui - Stock Route, Pines and Whales and the Island.