



caring about you & your environment

Report 00.713

19 October 2000

File: K/8/9/1

[Report 2000.Env00713.GRmm]

Report to Environment Committee
from Gretchen Robertson, Surface Water Quality Scientist

Faecal Coliform Investigation of the Mangapouri Stream, Otaki

1. Purpose

To present the results of recent faecal coliform tests conducted within the Mangapouri Stream.

2. Background

Wellington Regional Council baseline freshwater sampling has identified the lower Waitohu Stream as an area with poor stream health. Turbidity, biochemical oxygen demand, and ammonia levels are amongst the highest of the 50 freshwater sites monitored around the Region.

As an initial step to understanding the processes leading to the degradation of the lower Waitohu, a targeted investigation of stream health was conducted in the catchment (Robertson, 2000). This study identified higher ammonia, phosphorus, nitrate, conductivity, temperature, and biological oxygen demand within the main tributary of the Waitohu Stream (Mangapouri Stream) than the main channel of the Waitohu Stream. Oxygen saturation levels also breached the guidelines for aquatic ecosystem's purposes within the Mangapouri Stream.

At the time of sampling Caleb Royal (a lecturer from Te Wananga o Raukawa) conducted faecal coliform sampling within the Waitohu and Mangapouri Streams. Very high concentrations of faecal coliforms were found within the Mangapouri Stream. Wellington Regional Council Policy Advisor, Nigel Clarke, took further samples from the Mangapouri Stream on the 24th July 2000. These results confirmed the high faecal coliform concentrations and identified some areas of particular concern.

As a follow up to these investigations another sampling round was undertaken at 11 sites in the Mangapouri Stream on the 26th September 2000. The objective of this

sampling was to identify the sources of the high faecal coliform levels previously found.

3. Methods

Faecal coliforms are a bacterial organism associated with the gut of warm-blooded animals (including humans). These bacteria generally do not cause illness in humans, but indicate the presence of faecal material. This faecal material often contains pathogens that may cause illness in those coming in contact with the water itself or plants and fish harvested from the water.

Historically the guidelines for recreational water quality have used faecal coliforms as an indicator of potential risk (ANZECC, 1992). The guideline for primary contact (swimming and other activities involving direct contact with the water) was 150 faecal coliforms/100ml, whilst the guideline for secondary contact (boating and fishing) was set at 1000 faecal coliforms/100ml. The Ministry for the Environment and Ministry of Health are still conducting scientific studies to determine the best indicator for freshwaters. In the mean time *E. coli* has been given as the interim indicator species. The report uses the previous indicator (Faecal coliforms) as a guide to the quality of water in the Mangapouri Stream.

Eleven sites were chosen for analysis along the Mangapouri Stream (attachment 1). Sampling was conducted on the 26th September 2000. Many of the sites were in similar locations to those sampled by Clarke on the 24th July 2000 (attachment 2). Samples were taken during rainfall to determine a worst case scenario of bacterial contamination. This differed from the previous dry weather investigation undertaken by Clarke.

4. Results

Site Number	Site Name	Faecal coliforms/100ml
1	Drain adjacent to Otaki Race Course	9,000
2	Downstream of Freemans Rd	10,000
3	Above Otaki Race Course drain confluence	8,000
4	34 County Rd	625
5	Harata St	16,000
6	Mill Haven Rd	4,115
7	Huratai Park	3,110
8	Anzac Rd downstream of culvert	2,705
9	Opposite Otaki Primary School	1,185
10	Lupin Rd	1,270
11	St Peters Channel School	2,265

All sites sampled, breached the guidelines for primary contact recreation (ANZECC, 1992) recording faecal coliform reading above 150 faecal coliforms/100ml. Ten out of the 11 sites also breached the guidelines for secondary contact recreation recording faecal coliform reading above 1000 faecal coliforms/100ml. The exception was site 4 which met the guidelines for secondary contact recording a faecal coliform concentration of 625 faecal coliforms/100ml.

High faecal coliform counts were recorded in the upper sections of the stream at site 1 (the Race Course drain), site 2 (Freemans Rd), and site 3 (above the Race Course drain confluence). The drain adjacent to the Otaki Race Course is unfenced from grazing horses and runoff from pasture around the area appears to be the cause of high faecal coliform levels. The water from this drain is culverted beneath Rahui Rd and enters the Mangapouri Stream via another man made drain. The two other sites of high bacterial concentration were located Below Freemans Rd and approximately 200m below this point. It is likely that agriculture in the area is contributing to the high faecal coliform counts in the area. These upper catchment sites recorded faecal coliform concentrations consistent with results recorded in the Waikato from farm drains surrounded by intensive agriculture. Of the 69 streams and rivers monitored by Environment Waikato in 1998, 10 had maximum recorded counts exceeding 10,000 faecal coliforms/100ml (Ministry for the Environment, 2000). Stormwater discharges from the settlement above may also be providing a source of bacteria. Feral animals inhabiting the native bush on one side of the stream may also contribute some faecal material.

Further down the catchment, water quality improved at site 4 (34 County Rd) before deteriorating again at site 5. The highest faecal coliform concentration (16,000/100ml) was recorded at site 5 (Harata Rd). This general area recorded the highest faecal coliform concentrations in Clarke's previous investigation (attachment 2). Maps of the stormwater system indicate a discharge to the stream at a point in close proximity to the area. It has not yet been determined if this is the actual cause of the elevated faecal coliform levels recorded in the area.

It is important to note that the Mangapouri Stream is a small stream with relatively low volumes of water. This low water volume contributes to the high concentrations of faecal coliforms recorded in the stream as dilution is limited in comparison to larger rivers and streams. There is evidence of high levels of faecal contamination within the stream, however, and the small size of the stream is not an excuse for this.

5. Conclusions

Significant levels of faecal contamination were recorded within the Mangapouri Stream on the 24/7/00 and 26/9/00. All sites sampled on the 26th September 2000 breached the guidelines for primary contact recreation (ANZECC, 1992) which are set at 150 faecal coliforms/100ml. Furthermore, 10 out of the 11 sites breached the secondary contact guidelines of 1000 faecal coliforms/100ml.

There are a number of potential sources of faecal coliform bacteria within the Mangapouri Stream catchment. The upper catchment is influenced by agriculture and a number of farm drains enter the stream from surrounding pasture. Some stormwater drains also enter the stream in the upper catchment, but as the area is not densely

populated these point sources are sparse. It is likely that agriculture is the major source of faecal material in the upper catchment. The drain running adjacent to the Otaki Racecourse, is an example of a waterway influenced solely by grazing animals. There are no point source discharges to this waterway; the major sources of faecal coliforms are horses and ducks, yet the faecal count was 9,000/100ml. The upper Mangapouri has a number of similar drains discharging to it, while the main channel is also surrounded by agriculture. Agriculture is therefore thought to be the main source of faecal material in the upper Mangapouri Stream.

Further down the catchment, land use intensifies to primarily urban. The highest faecal coliform reading of all sites was recorded at site 5 (Harata Rd). The concentration recorded at this site was 16 times higher than the guideline for secondary contact recreation. Approximately 100m downstream at site 6, the faecal coliform count had dropped to about a quarter of that recorded at site 5 and levels remained relatively low further downstream. As the general area around site 5 was found to be a problem in Clarke's previous investigation, there seems to be a concentrated source of faecal coliforms entering the Mangapouri Stream between the State Highway and Harata St. The source of this is still unknown.

6. Further Action

The results of this investigation and the previous investigation undertaken by Clarke (24/7/00) will be presented to the Kapiti Coast District Council. Following this, the Resource Investigations Department will liaise with the Kapiti Coast District Council to determine the source of faecal coliforms around site 5.

The results will also be passed to the Public Health Service. We are aware that people take watercress from the stream and children swim in it. The health implications of these activities need to be managed by the Health Authorities.

7. Communications

The findings of the investigations will be communicated to the public through a press release. This will involve warning people not to eat watercress from the stream, without boiling it first, and advising people to not allow children to swim in the stream. Results will also be presented to the Kapiti Coast District Council and the Public Health Service in the form of a short report. Discussions will then be held between the Resource Investigations Department and the Kapiti Coast District Council to decide how best to address the faecal contamination identified by this investigation.

8. Regional Policy Statement Implementation

Investigation of the Mangapouri Stream and the causes of faecal contamination help achieve policies 5.4 (4,5,6,7) relating to the quality of freshwater.

9. Recommendation

That the information be received and noted.

Report prepared by:

Approved for submission:

GRETCHEN ROBERTSON
Surface Water Quality Scientist

JOHN SHERRIFF
Manager, Resource Investigations

JANE BRADBURY
Divisional Manager, Environment

Attachments: 2