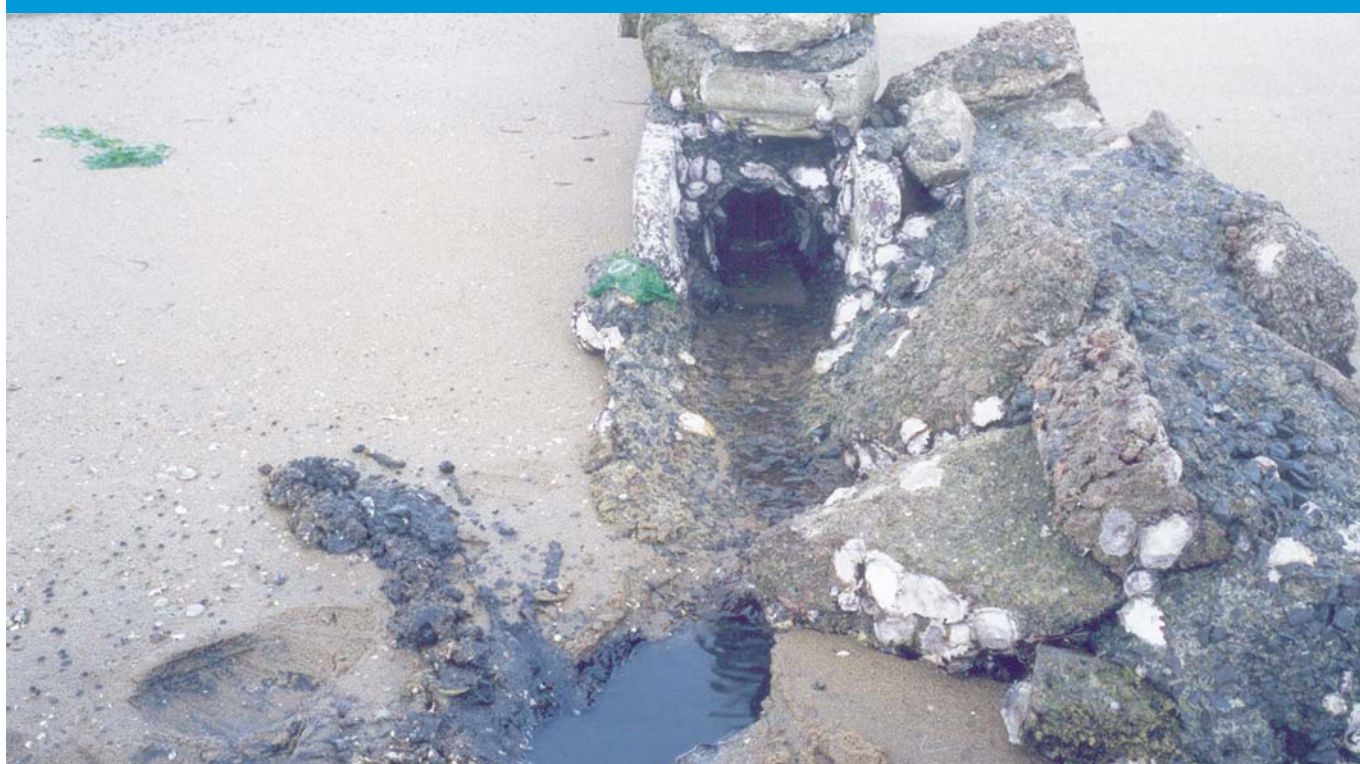


# Impact of Septic Tank Contamination at Te Puna

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Environment Bay of Plenty  
Environmental Publication 2003/10  
June 2003 Update

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ISSN 1175 - 9372

## **Acknowledgement**

Former Environmental Scientist, John Gibbons-Davies,  
for sample collection and data analysis

Cover photo: One of the drains (No.9) that discharge to Te Puna Estuary



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## Chapter 1: Introduction

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The On-Site Effluent Treatment Regional Plan became Operative in December 1996. Within the Plan, policies were developed to give guidance for the use of on-site effluent treatment systems.

The policies addressed:

- (a) The issue of contamination through poor maintenance and servicing of systems;
- (b) The lack of knowledge of what lay below the ground at each household;
- (c) The need for a maintenance programme to be developed; and
- (d) The need for continued environmental monitoring.

Ian Gunn, an on-site treatment specialist from Auckland Unitec Services, was contracted in 2001 to review the on-site effluent treatment and disposal programme for specific communities, and in his report he recommended increased monitoring of three communities in Tauranga Harbour, one in Opotiki, two on the shores of Lake Rotoiti, and one at Lake Tarawera.

Te Puna, one of the communities identified by Ian Gunn as requiring increased monitoring, was not included in the previous on-site effluent monitoring and inspection programme. Environmental Publication 2002/07, *Impact of Septic Tank Contamination at Te Puna*, reported on the impact of septic tank contamination at Te Puna. This report identified specific areas where highly contaminated discharges were occurring. The Medical Officer of Health, for Pacific Health, was advised of the public health hazard.

In December 2002 the Te Puna community agreed to join the maintenance programme of regular cleaning and inspection of their systems.

This report discusses the results of the monitoring programme at Te Puna between 8 May 2002 and 26 May 2003, and the results of monitoring of septic tank systems up to June 2003.



## Chapter 2: Septic Tank Maintenance Programme

In December 2002 the Te Puna community started a voluntary maintenance programme. The area covered by the programme covers 136 properties, including seven empty sections. Some sections may have more than one dwelling on them. At the start of June 2003, 52 inspection forms had been received. There is also one system for which Environment Bay of Plenty is not expecting an inspection as a new system was installed under resource consent 61569 in 2002.

About 55% of systems reported so far have failed. As expected there is a predominance of failures around the Waitui Reserve but not an absence of failures elsewhere. Pass/failure rates for reports received by June 2003 are shown in Figure 1. A gross failure was reported for a property in Fairlie Grove where a pumice concrete tank had deteriorated to the point it no longer contained any effluent and was positioned directly over a pipe believed to be a stormwater drain. The owner of this property had a new system installed by the time Environment Bay of Plenty received the report and therefore for the purposes of the analysis of causes for failure has been ignored.

Table 1: Summarises the various causes for failure.

Problem	Number for Te Puna	Percentage of Te Puna systems	Percentage in total database
Tank size between 2000 litres and 2700 litres	17	32%	37%
Tank size below 2000 litres	3	6%	24%
Failure of soakage field/soak hole	11	20%	6%
Groundwater clearance too low	6	12%	<1%
<i>Groundwater clearance marginal</i>	2	4%	3%
Physical barrier within 5 metres causing problem	3	6%	2%
<i>Physical barrier within 5 metres no obvious problem</i>	5	10%	4%
Access for regular maintenance	5	10%	1%
Condition of Tank	0	0%	7%

Those in italics do not score enough points by themselves to cause failure of inspection.

The systems at seven properties have multiple causes for failure.

Approximately 20% of the systems have a failed soakage field/soak hole. This compares to only 6% of all systems in the entire database failed for this characteristic. Additionally 70% of systems in Te Puna are served by soak holes (of those communities on the maintenance programme only Woodlands has a higher percentage), which will be affording little treatment of the effluent discharged from the septic tanks. In total 80% of systems at Te Puna are served by a failed soakage system or a soak hole or both.



The number of systems with low groundwater clearance and close proximity to a physical barrier to horizontal soakage such as a cutting or retaining wall is also higher than in many other areas but not in league of some communities e.g. Hinehopu >50% groundwater clearance issues.

The median section size at Te Puna is just over 1000m<sup>2</sup> with the most common section size being just under 1000m<sup>2</sup>. Therefore depending on soil types and how much of sections are developed there may be reasonable potential for upgrade of the treatment, post the septic tanks.

Only 40% of systems have been reported so far and therefore the above analysis needs to be treated with some caution. At this stage it is too early to decide whether Environment Bay of Plenty should be advising property owners to remedy any minor causes for failure within a defined time period and advising other solutions such as sewage reticulation. However, for those property owners whose systems failed because of the disposal field then there is a need to take action in the shorter term. Similarly, if any more systems like the one in Fairlie Grove described above are revealed then urgent action would be required.

Based on the information to date, the practicality and effectiveness of replacing all soak holes with effluent trenches and installing raised beds for the Waitui Reserve area may need to be considered. However, it is important that Environment Bay of Plenty wait till the remaining properties are inspected to confirm these are correct options to pursue.

## Chapter 3: Environmental Monitoring

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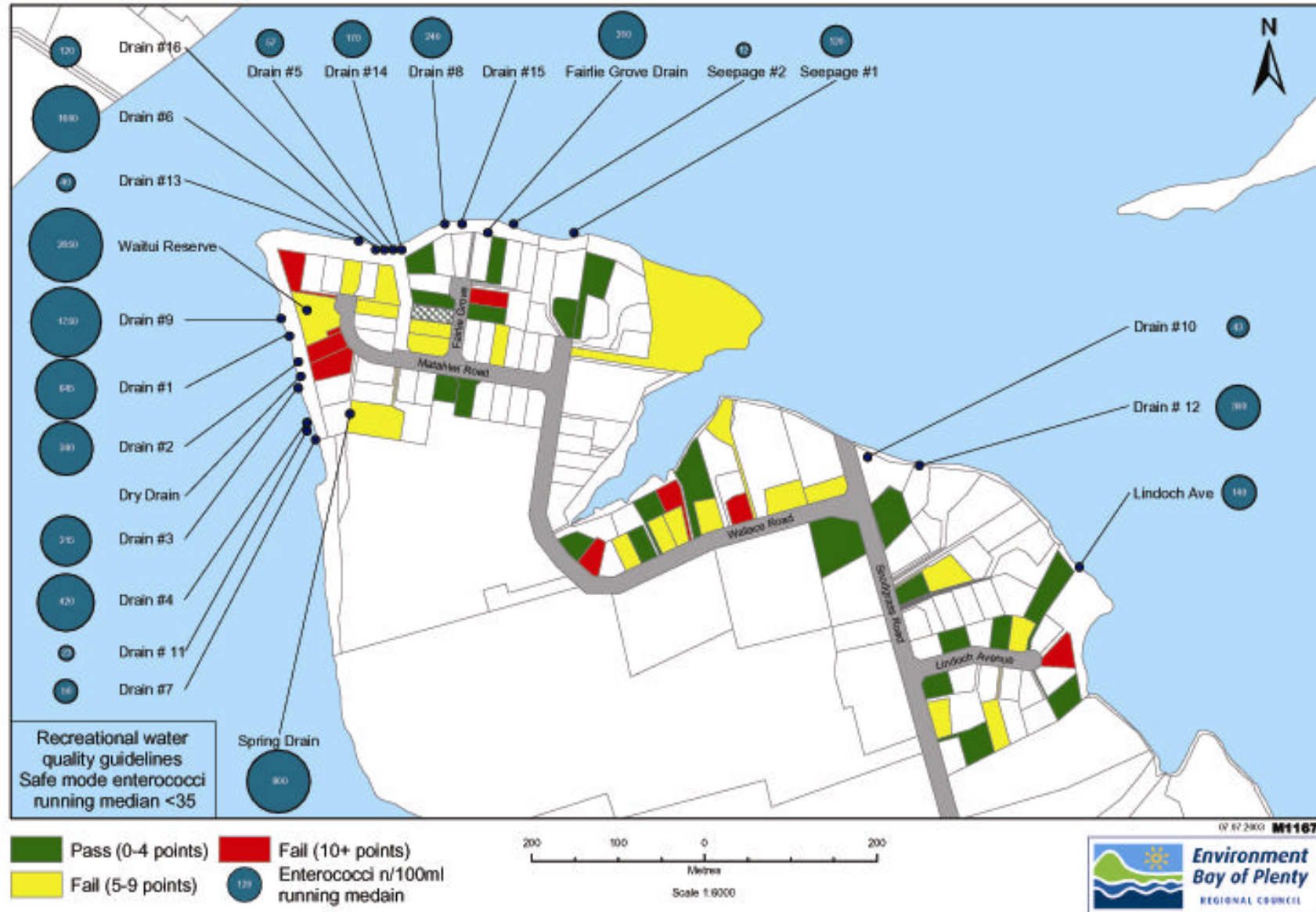
The Waitui Reserve and the Lindoch Ave drains were first sampled in 1997. Since then there has been a dramatic increase in the enterococci and faecal coliforms found in the discharge from the Waitui Reserve drain with the counts being consistently in the tens of thousands and occasionally in the hundreds of thousands. The Lindoch Ave drain has also been consistently higher although the numbers are an order of magnitude lower than the Waitui Reserve drain.

The median enterococci numbers for each sample point during the period covered by this report compared with Recreational Water Quality guidelines are shown in Figure 1.

A dramatic increase in the bacterial number was observed in the discharges from the drains entering the estuary around the community, and in particular the discharge from the Waitui Drain, in May 2002. The results for the following 12 months indicate that there has been little change to the bacterial numbers since then. There was an initial decline in bacteria counts in January, February and March of this year, but this may be due the dry weather experienced over those months. The higher counts since then may be a result of increased rainfall events.

It can be seen from the tables of results (Appendix 1) that there has been no pattern of decreasing bacteria numbers since the voluntary inspections started in December 2002. Those drains that exhibited high numbers in the past continue to do so.

Figure 1: Te Puna Sampling Sites



## Chapter 4: Conclusion

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Drains entering Tauranga Harbour around Te Puna area continue to show elevated bacterial level septic tank contamination. This bacterial contamination presents a significant health hazard for the community when using the estuary for recreational purposes.

Only 40% of systems have been cleaned, inspected and reported on so far. This is too few to enable Environment Bay of Plenty to fully assess the problem. However, early indications are that a high percentage of soak holes and failed soakage systems, along with poor groundwater clearance around the Waitui Reserve may be key factors. Of the systems reported so far there is a predominance of failures around the Waitui Reserve but not an absence of failures elsewhere.

Environment Bay of Plenty needs to continue to encourage the remainder of the Te Puna community to have their septic tank systems cleaned and inspected voluntarily, while proceeding with a change to the On-Site Effluent Treatment Regional Plan to formally include Te Puna in the compulsory Maintenance Programme.



## Appendices

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### *Appendix I – Environmental Monitoring Data*



## Appendix I – Environmental Monitoring Data

Sample Location	Date	Sample	pH	Enterococci/ 100ml	Faecal Coliforms/100ml
Waitui Reserve	08/05/02	022243	9.59	8000	5000000
	13/05/02	022312		700	19000
	23/05/02	022495	7.3	22000	370000
	06/06/02	022619	7.7	1900	730
	19/06/02	022818	7.1	4700	36000
	04/07/02	022977	6.97	590	21000
	08/07/02	023007		130	19000
	04/11/02	024426	7.39	13	600000
	17/11/02	024601	7.72	2000	82000
	02/12/02	024807	7.6	4700	97000
	16/12/02	025142	7.6	700	4700
	13/01/02	030136	7.1	39000	220000
	29/01/03	030607	7.1	1230	80000
	14/02/03	030953	7.5	2100	59000
	12/03/03	031493	6.9	6700	14000
	01/04/03	031877	7	1000	360000
	01/05/03	032392	7.2	9100	340000
26/05/03	032776		190000	1400000	
Lindoch Ave.	04/07/02	022978	6.93	80	660
	08/07/02	023008		140	230
	04/11/02	024429	7.23	2400	57
	17/11/02	024599	7.33	2000	160
	02/12/02	024810	7.7	80	6200
	16/12/02	025143	7.2	3100	2700
	13/01/02	030141	6.9	120	970
	29/01/03	030610	6.7	17	40
	14/02/03	030954	7.4	1200	4100
	12/03/03	031499	6.9	210	3900
	01/04/03	031881	6.9	7	20
	01/05/03	032388	7.1	220	390
	26/05/03	032782		100	190
Drain #4	04/07/02	022979	6.81	170	6600
	08/07/02	023012		820	24000
	04/11/02	024424	7.4	59	7800
	17/11/02	024596	7.53	1600	510000
	02/12/02	024805	7.5	34	47
	16/12/02	025139	7.4	290	3000
	13/01/02	030133	7	1600	4100
	29/01/03	030605	7.6	100	1900
	14/02/03	030952	7.8	1900	3200
	12/03/03	031489	6.7	1300	5200
	01/04/03	031873	6.8	1000	6600
	01/05/03	032384	7.7	420	220000
	26/05/03	032773		90	2700
Drain #1	04/07/02	022980	6.89	1100	23000
	08/07/02	023009		1100	3200



Sample Location	Date	Sample	pH	Enterococci/ 100ml	Faecal Coliforms/100ml
	04/11/02	024425	7.28	80	89000
	17/11/02	024597	7.64	5200	740000
	16/12/02	025141	7.7	2400	3400
	13/01/02	030135	6.9	640	20000
	12/03/03	031492	6.6	650	6900
	01/04/03	031876	6.8	190	100
	01/05/03	032385	7	190	1400
	26/05/03	032771		630	3700
Drain #2	04/07/02	022981	7.69	3600	170
	08/07/02	023010		6100	1200
	12/03/03	031491	7.3	130	7100
	01/04/03	031875	7.7	340	410
	26/05/03	032772		110	410
Drain #3	04/07/02	022982	7.1	640	940000
	08/07/02	023011		50	7100
	02/12/02	024806	7.6	270	74000
	16/12/02	025140	7.7	160	2100
	13/01/02	030134	7	410	41000
	12/03/03	031490	6.7	570	97000
	01/04/03	031874	7	40	890000
	26/05/03	032786		60	410
Drain #5	04/07/02	022983	7.36	57	280
	08/07/02	023013		12	370
	12/03/03	031495	7.4	900	5800
Fairlie Grove Drain	04/07/02	022984	6.52	540	800
	12/03/03	031497	7.6	1600	4200
	01/04/03	031879	7.6	270	330
	01/05/03	032386	7.6	310	470
	26/05/03	032778		100	410
Drain #6	08/07/02	023014		20	150
	13/01/02	030138	7.6	1700	1300
	12/03/03	031496	7.3	1600	310
Drain #7	08/07/02	023015		1400	26000
	13/01/02	030132	7.5	20	150
	12/03/03	031488	7	50	140
	01/04/03	031872	7.6	5	9
	01/05/03	032383	6.9	14	200
Drain #9	08/07/02	023016		77	570
	02/12/02	024808	7.5	200	1200
	13/01/02	030137	7.2	5700	29000
	12/03/03	031494	7.3	1600	1300
	01/04/03	031878	7.5	2600	67
	26/05/03	032775		1900	13
Drain #8	08/07/02	023017		140	3300
	04/11/02	024427		90	90
	17/11/02	024602	7.69	730	160
	02/12/02	024809		220	1200
	13/01/02	030139		240	130
	29/01/03	030608	7	33300	8000
	01/05/03	032393	6.2	390	1000
Seepage #1	08/07/02	023018		73	40
	04/11/02	024428	6.95	190	37

Sample Location	Date	Sample	pH	Enterococci/ 100ml	Faecal Coliforms/100ml
	17/11/02	024598	7.42	73	120
	13/01/02	030140	7.1	90	60
	29/01/03	030609	7.4	120	800
	12/03/03	031498	6.8	170	160
	01/04/03	031880	6.8	70	1
	01/05/03	032387	6.8	180	90
	26/05/03	032779		600	100
Drain #10	08/07/02	023019		10	43
Drain # 11	04/11/02	024430	7.68	27	2400
	17/11/02	024600	8.11	5	20
	26/05/03	032774		23	47
Drain # 12	04/11/02	024431	6.79	37	170
	17/11/02	024603	7	140	490
	02/12/02	024811	6.7	1700	240
	16/12/02	025144	7.2	470	900
	13/01/02	030142	6.7	310	430
	29/01/03	030611	7.4	1200	4000
	14/02/03	030955	7.1	300	2700
	12/03/03	031500		400	2000
	01/04/03	031882	6.8	230	90
	01/05/03	032389	6.8	37	130
	26/05/03	032781		87	13
Spring Drain	12/12/02	025062	6.32	130	900
Drain #13	13/01/02	030143	7.5	40	70
Seepage #2	13/01/02	030144	7	53	40
	01/05/03	032391	6.9	31	12
	26/05/03	032780		30	3
Drain #14	12/03/03	031501	7.4	160	170
	01/05/03	032390	7.1	160	80
	26/05/03	032777		23	270
Drain #16	26/05/03	032785		40	120

Drain #15

No data for this reporting period.

