Environment B·O·P
Environmental Report 99/11
May 1999

ENVIRONMENT B·O·P
Bay of Plenty Regional Council

Compliance Report Tauranga District Council Discharge of Tauranga and Mount Maunganui Sewage Consent Numbers 02 3803 and 02 3540

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Cover Photo: View of Te Maunga Sewage Treatment Plant and Artificial Wetland for Sewage Treatment.

Contents

Chapter 1: Introduction

Sewage from the Tauranga District is reticulated to either of two wastewater treatment facilities. The Tauranga City area is serviced by the Chapel Street wastewater treatment plant and the Mount Maunganui and Papamoa areas are serviced by the Te Maunga sewage plant (previously treatment ponds). Treated effluent from the Chapel Street treatment plant is then piped via the Tauranga Harbour Bridge to the Te Maunga wastewater treatment plant for further treatment in wetlands. The effluents from each plant are then combined and discharged via the Omanu ocean outfall to the Pacific Ocean.

During drier periods of the year, a portion of reclaimed water from the Chapel Street sewage treatment plant is used for irrigation of various parks and reserves.

Chapter 2: History and Background

2.1 The Tauranga District Council has previously held consent for the discharge of treated sewage via its Otumoetai Outfall into the Tauranga Harbour. It was decided by the Council as a result of public consultation that it should aim to curtail the discharge of treated sewage to the harbour. Over recent years it has worked to achieve this objective by investigating alternative treatment and disposal options for both Tauranga City and Mount Maunganui sewage.

2.2 The final option selected was to retain the existing treatment facilities at Chapel Street and Mount Maunganui, to add disinfection to the Chapel Street process and polish via wetland treatment prior to discharge to the ocean via the existing Omanu Outfall. This outfall has been used for some years for the discharge of Mount Maunganui treated effluent.

The decision to disinfect the effluent from the Chapel Street wastewater treatment plant was two-fold. Disinfection was initially added to protect the Tauranga Harbour water from bacterial contamination. With the long term treatment and disposal options it was decided that effluent should be utilised for irrigation of parks and reserves where possible. As these parks and reserves are public access areas disinfection was necessary to protect public health in these disposal areas.

2.3 The treatment process at each place comprises the following:

- Chapel Street, primary treatment followed by secondary treatment by the contact stabilisation activated sludge process. Final treatment by UV light disinfection. This effluent is then piped to Te Maunga where it is treated via a wetland prior to discharge.

- Mount Maunganui has an extended aeration plant and clarifier followed by an oxidation pond and wetland. This effluent is discharged via the existing ocean outfall. Figure 1 shows the layout of the Te Maunga waste treatment site and wetlands.

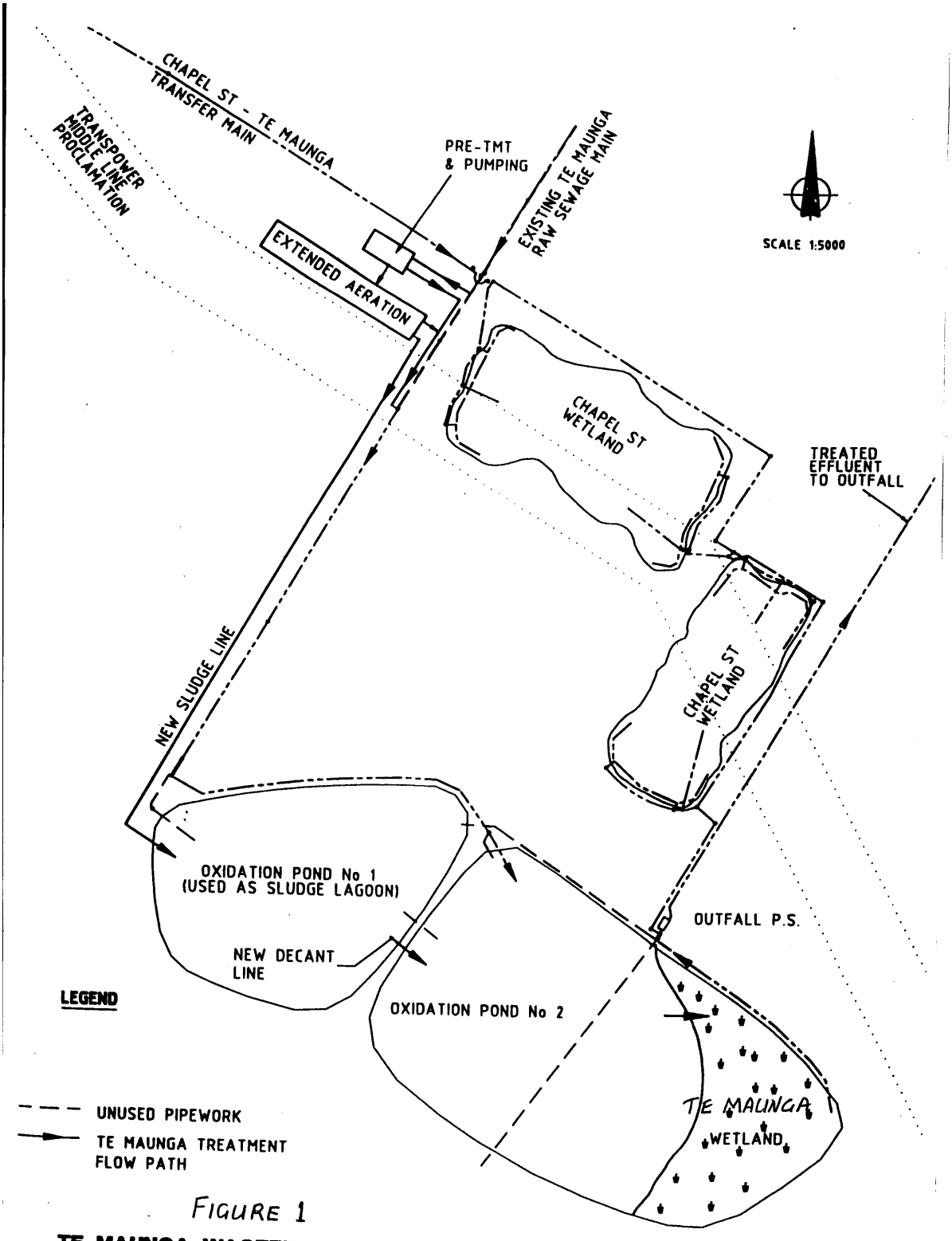


FIGURE 1

TE MAUNGA WASTEWATER TREATMENT PLANT PIPELINE ROUTES AT END OF 1997

2.4 As already mentioned disinfected effluent (reclaimed water) from the Chapel Street wastewater treatment plant is also utilised for irrigation of parks and reserves. Irrigation takes place only during the dry periods of the year. The reclaimed water is supplied to the sites by the pipeline between Chapel Street and the Te Maunga treatment plant. Discharge of this treated effluent to land is authorised by consent number 02 3803. Compliance with this consent is also reported to this document.

2.5 The consents relating to the treatment and discharge of Tauranga and Mount Maunganui sewage are outlined in Table 1 below. A copy of all these consents are attached as Appendix I.

Table 1

Consent Number	Purpose	Date of Expiry
02 3540	Discharge of treated sewage from the Tauranga and Mount Maunganui wastewater treatment plants into the Pacific Ocean.	30 April 2005
02 3803	Discharge of reclaimed water from the Chapel Street Sewage Treatment Plant on to land.	30 April 2005

Chapter 3: Methodology

3.1 Staff have assessed the compliance with consent conditions and impact on the receiving environment in the following ways:

- Site inspections have been undertaken to assess compliance with conditions relating to maintenance and construction at the site. These inspections have been undertaken at various times.

- The applicant is required to collect data and analyse effluent samples as conditions of consent. The results submitted have been assessed against consent limits specified in the consent.

- Independent effluent samples have been analysed by Environment B·O·P and compared with consent conditions.

Compliance has been assessed over the period since the last compliance report, December 1996 – April 1999.

Chapter 4: Compliance

Compliance with consent conditions is detailed below. The order of comparison for each consent is as listed in Table 1. A copy of each consent is attached as Appendix I.

4.1 Consent 02 3540

This is the main discharge consent. It authorises the discharge of effluent to the ocean from both Tauranga City and Mount Maunganui.

The following outlines consent conditions which require monitoring:

Condition 2 Quantity and Rate of Discharge (37,000 m^3/d)

Condition 3 Point of Discharge

Condition 4 Outfall

Condition 5 Treatment System Operation and Maintenance

Condition 6 Effluent Analysis and Monitoring

Condition 7 Effluent Quality

Condition 8 Effluent Monitoring

Condition 9 Microbiological Water Monitoring

Condition 10 Microbiological Shellfish Monitoring

Condition 11 Arsenic and Heavy Metal Monitoring

4.1.1 Point of Discharge and Outfall

The point of discharge has not been altered since the granting of consent. Condition 4.2 requires that the outfalls be inspected at least once per annum, and the results be sent to Environment B·O·P. The frequency of monitoring complies with consent requirements and the latest inspection was undertaken in December 1998.

4.1.2 Treatment System Operation and Maintenance

Condition 5 requires that:

- The treatment and disposal system be operated and maintained in accordance with sound engineering practices

- Effluent from the Chapel Street Sewage Treatment Plant be disinfected, and treated in a wetland with a hydraulic residence time of at least two days, and

- Effluent from the Te Maunga Sewage Treatment Plant be treated in an oxidation pond and wetland (with a hydraulic residence time of at least two days) prior to discharge.

Staff visit both treatment plants regularly and believe that they are managed and operated effectively. Disinfection is in place at Chapel Street as required. The only area of non-compliance is that the Te Maunga Sewage Treatment Plant comprises an activated sludge treatment system rather than the oxidation ponds as specified in condition 5.4. Tauranga District Council has recently made application for a change to consent conditions to alter the wording to include the actual process.

Staff do not consider this as significant non-compliance as the alternative treatment system is able to produce better quality effluent than the oxidation ponds, has less potential for odour and can be managed more precisely according to loading rate.

4.1.3 Effluent Analysis and Monitoring

Condition 6 requires that accessible sampling sites be maintained, effluent analysis be undertaken to appropriate protocols and that flow gauging stations are available at both the Chapel Street Sewage Treatment Plant and at Te Maunga. All aspects of this condition have been complied with to date.

4.1.4 Effluent Quality

Condition 7 specifies the minimum effluent quality for:

- BOD_5

- Suspended Solids, and

- Enterococci bacteria

It also specifies that the effluent discharged shall be substantially free from oil and grease, and that the Tauranga District Council maintains trade waste bylaws to control the discharge of toxic substances into the sewer.

Checking the records indicates:

- Full compliance with the BOD5, Suspended Solids and Enterococci standards except one suspended solids sample which read 136 g/m^3 on 17 December 1998. Tauranga District Council staff believe this elevated suspended solids result was caused by algae growth in the wetland. Visual inspection of effluent reveals it contains no oil or grease. The Tauranga District Council does maintain appropriate trade waste bylaws as required.

4.1.5 Effluent Monitoring

The consent holder is required to monitor the following parameters as listed below:

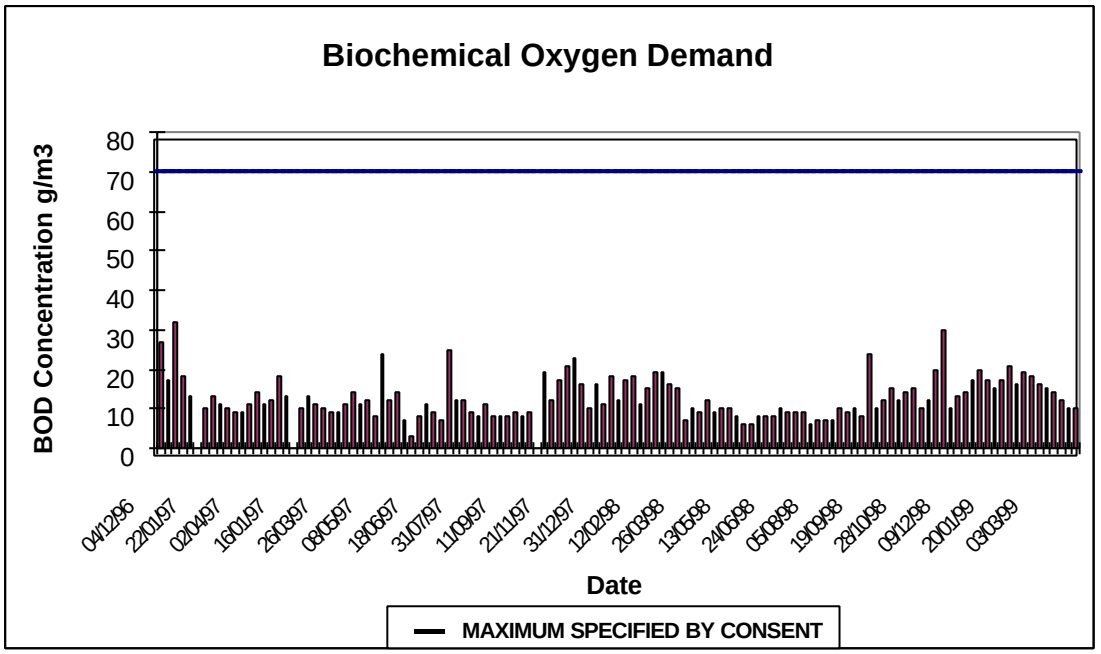
- Daily effluent volume,
- At least once per week analyse a 24 hour flow proportional sample and analyse for:
    - BOD5
    - Suspended Solids
    - Total Phosphorus
    - Amonia Nitrogen
    - Total Kjeldahl Nitrogen
    - Nitrate Nitrogen
- Collect five samples monthly and analyse for enterococci bacteria, and
- Analyse effluent for a specified range of heavy metals in May and December each year.

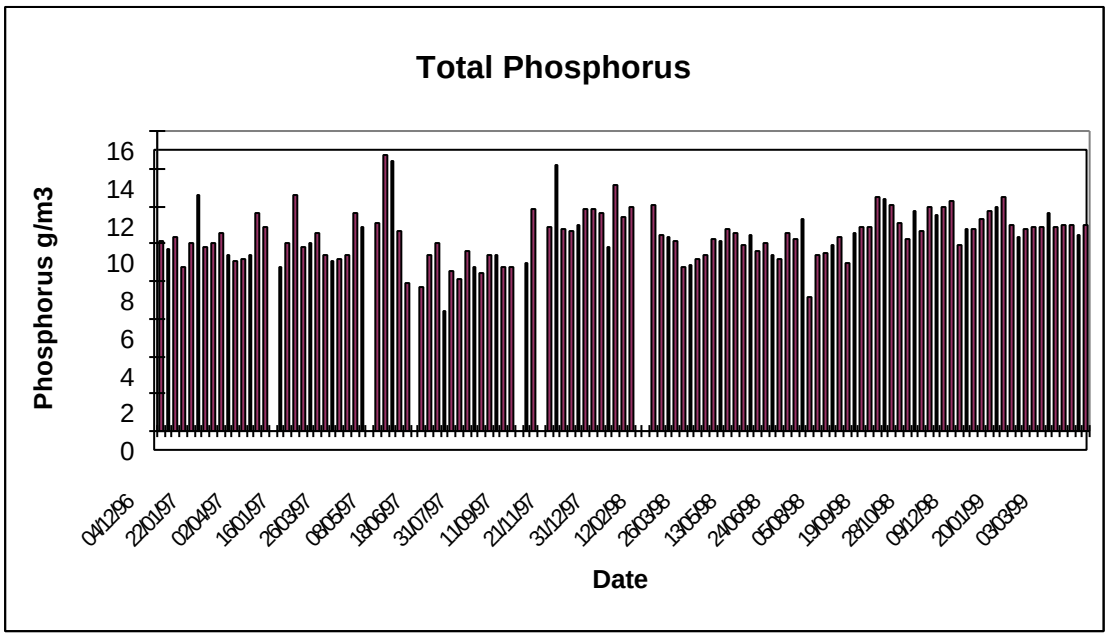
The daily effluent volume has not exceeded the limit of 37,000 m^3/d. Daily records are collected and submitted as required.

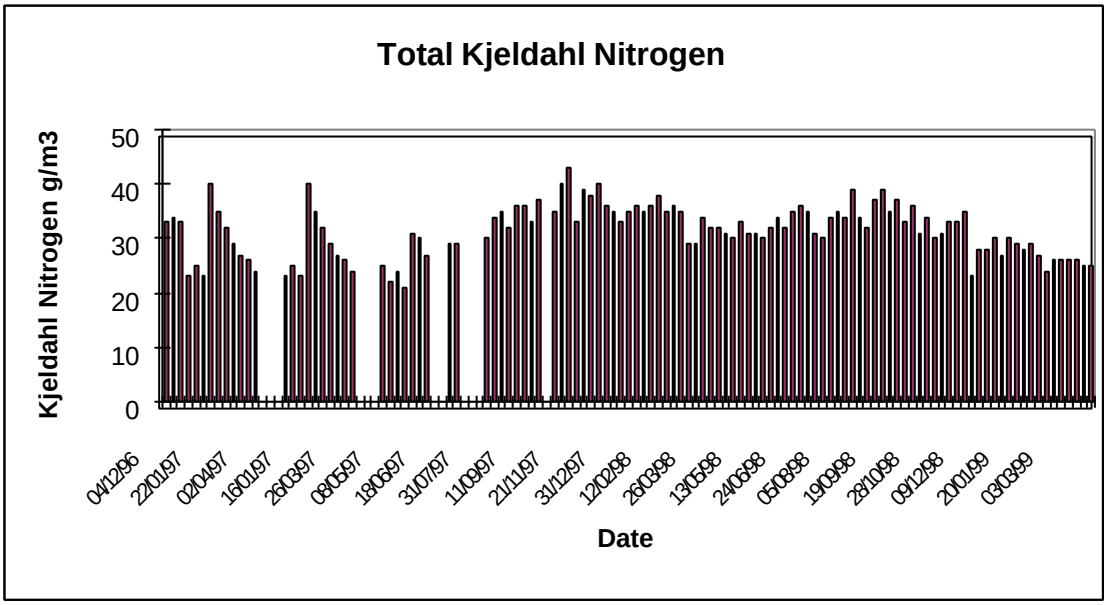
With respect to weekly effluent analyses required, the results of monitoring are presented in graphs below. The main conclusions from reviewing the graphs are:

- The BOD_5 easily meets the consent limit and is consistently below 25 g/m^3.
- The suspended solids exceeded the limit of 95 g/m^3 on one occasion but is consistently within the range of 10-60 g/m^3. It is likely that at higher suspended solids concentration, algal growth in the wetland system is elevating the concentration in the sample.
- Total phosphorus is consistently in the range of 10-14 g/m^3. This is the normal concentration found in untreated domestic effluent and supports the conclusion that the treatment systems are not removing significant quantities of phosphorus.
- Three forms of nitrogen are measured. Total Kjeldhal nitrogen (TKN) is a combination of organic nitrogen and ammonia nitrogen (NH_4) (also monitored). Perusal of the graphs for TKN and NH_4 indicates that the nitrogen is predominantly in the form of ammonia.
- Nitrate nitrogen is also monitored. Levels are low peaking at about 2 g/m^3.

- Generally monitoring shows the performance of the treatment system is consistent with what would be expected of activated sludge type treatment system, not specifically designed for nitrogen removal. Suspended solids concentrations however, are generally elevated. This is most likely due to increased algae growth in effluent as it passes through the wetlands.






Total Kjeldahl Nitrogen
Kjeldahl Nitrogen g/m3
50
40
30
20
10
0
04/12/96
22/01/97
02/04/97
16/01/97
26/03/97
08/05/97
18/06/97
31/07/97
11/09/97
21/11/97
31/12/97
12/02/98
26/03/98
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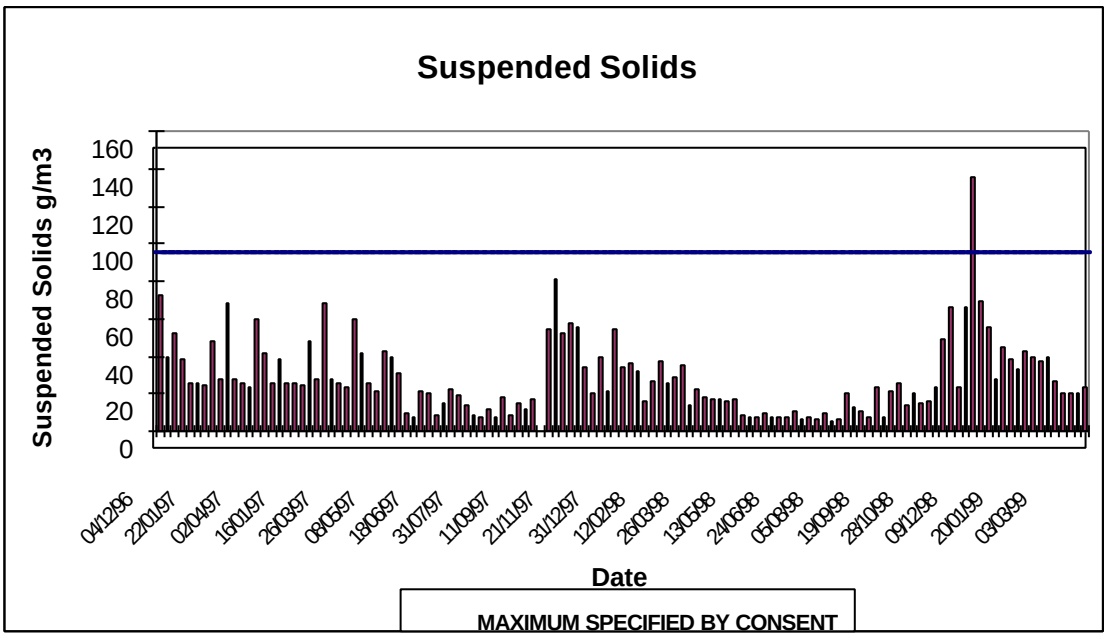
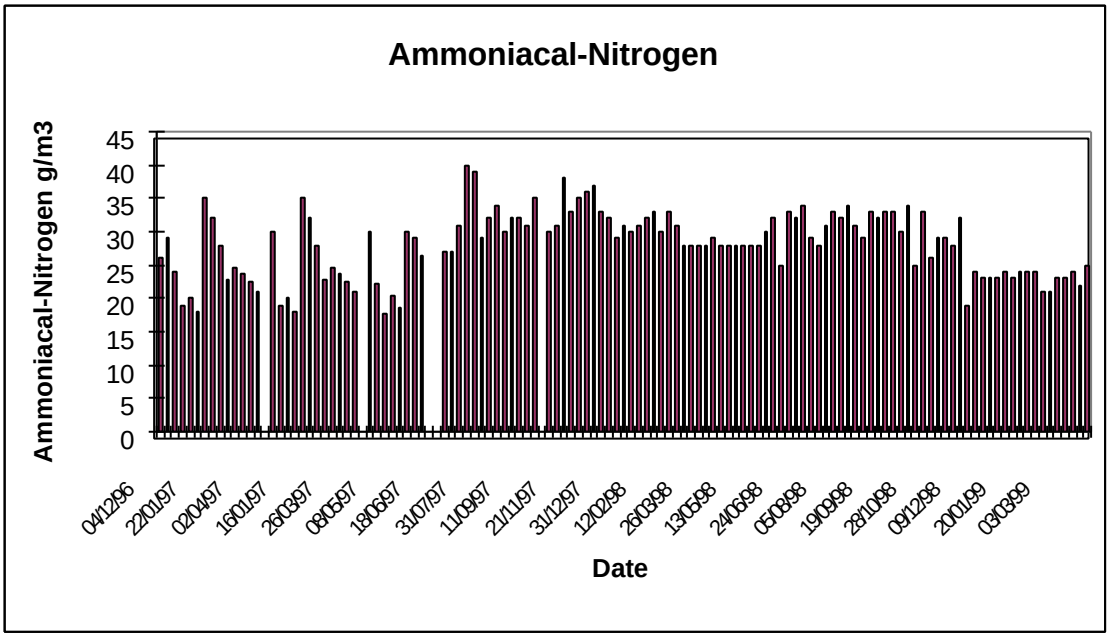
20/01/99
03/03/99
Date


Suspended Solids
Suspended Solids g/m3
160
140
120
100
80
60
40
20
0
04/12/96
22/01/97
02/04/97
16/01/97
26/03/97
08/05/97
18/06/97
31/07/97
11/09/97
21/11/97
31/12/97
12/02/98
26/03/98
13/05/98
24/06/98
05/08/98
19/09/98
28/10/98
09/12/98
20/01/99
03/03/99
Date
MAXIMUM SPECIFIED BY CONSENT


Ammoniacal-Nitrogen
Ammoniacal-Nitrogen g/m3
45
40
35
30
25
20
15
10
5
0
04/12/96
22/01/97
02/04/97
16/01/97
26/03/97
08/05/97
18/06/97
31/07/97
11/09/97
21/11/97
31/12/97
12/02/98
26/03/98
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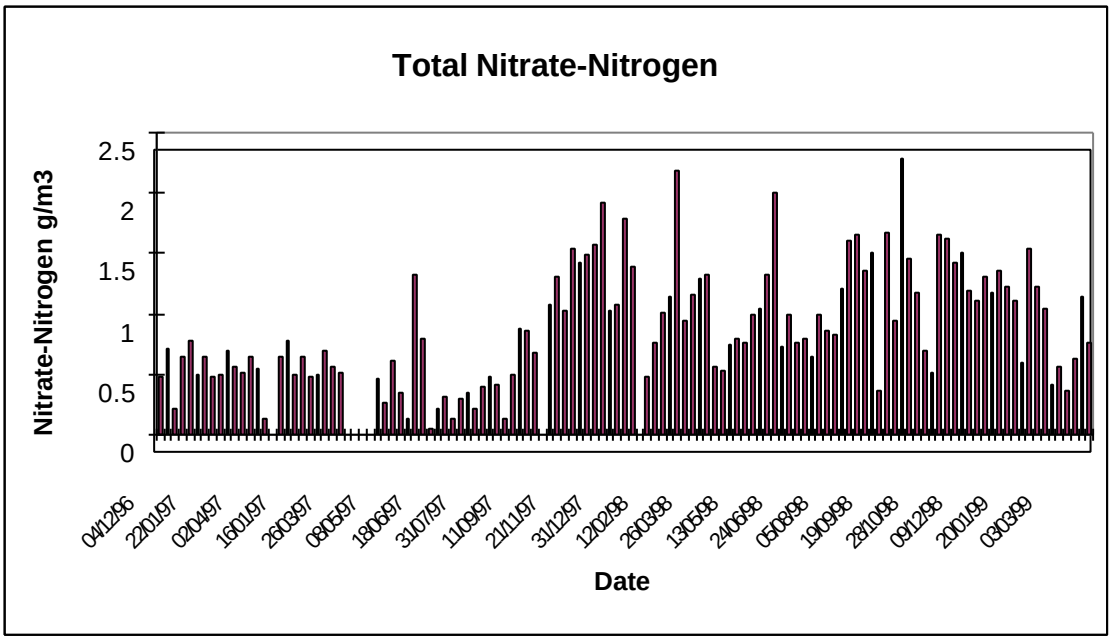
Total Nitrate-Nitrogen
Nitrate-Nitrogen g/m3
2.5
2
1.5
1
0.5
0
04/12/96
22/01/97
02/04/97
16/01/97
26/03/97
08/05/97
18/06/97
31/07/97
11/09/97
21/11/97
31/12/97
12/02/98
26/03/98
13/05/98
24/06/98
05/08/98
19/09/98
28/10/98
09/12/98
20/01/99
03/03/99
Date

The monthly enterococci results have not been graphed. As already mentioned, they comply with the limits set in condition 7.5

Effluent heavy metal monitoring has been undertaken generally as required (ie six monthly, however all monitoring events have not fallen in May or December as required).

Results of heavy metal monitoring have been summarised in the period June 1995 – December 1998 below. This includes data for the period six months prior to the compliance period specified in section three, but have been included to increase the data set.

Table 2: Maximum and average concentrations of Heavy Metals in Tauranga District Council treated effluent and ambient water quality criteria for protection of aquatic life.

	Arsenic (As) g/m³	Chromium (Cr) g/m³	Mercury (Hg) g/m³	Lead (Pb) g/m³	Cadmium (Cd) g/m³	Copper (Cu) g/m³	Nickel (Ni) g/m³	Zinc (Zn) g/m³
Maximum	0.003	0.004	0.0033	0.0249	0.0002	0.0141	0.017	0.278
Average	0.002	0.001756	0.00123333	0.00303	0.000116	0.00869	0.00436	0.089429
1 hour Average*	0.069	1.1	0.0021	0.14	0.043	0.0029	**0.140	** 0.17
4 day Average *	0.036	0.050	0.000025	0.0056	0.0093	**0.004	**0.0071	** 0.05

* Maximum one hour average and four day average concentrations for the protection of aquatic life on the marine environment (EPA 1985 ambient water quality criteria)

** Where one hour and four day average are not specified EPA 1980 maximum and average guidelines have been included respectively.

The maximum and average heavy metal concentrations in the treated effluent have been compared with one hour average and four day average concentrations for the protection of aquatic life in Table 2. It should be noted that the EPA values quoted in Table 2 are ambient water quality criteria for protection of aquatic life, and these have been compared with effluent concentrations of heavy metals. Further dilution of effluent will occur as it is discharged into the environment, via the ocean outfall.

All heavy metal concentrations in the treated effluent met the EPA 1985 ambient water quality criteria, except copper and zinc. Although copper and zinc both exceed the standards for protection of aquatic life the maximum exceedance is 8.23 times for the copper. Once released to the environment the initial dilution is at least 25 times which will result in ambient water quality criteria being met for both copper and zinc.

4.1.6 Microbiological Water Monitoring

The consent holder is required to monitor water quality for enterococci bacteria at nine stations off the beach to determine water quality around the outfall region. These stations are located at 500 m intervals either side of the outfall. Surveys have been undertaken generally as required for the compliance period.

Samples are required to meet the following standard:

- The median of enterococci samples taken over the bathing season shall not exceed 35 per 100 mls, and
- Any single sample shall not exceed 101 per 100 mls.

All single sample and median results meet the required standards. Enterococci levels encountered are generally in the range of 0-2 per 100 mls and clearly comply with bacterial limits.

4.1.7 Microbiological Shellfish Monitoring

The consent holder is required to monitor shellfish for bacterial quality at 5 stations off the beach to determine bacterial contamination of shellfish around the outfall region, with respect to the Health Department guidelines.

The monitoring has generally met the requirements for sample location and sampling times. However, condition 10.4 requires that each survey shall consist of five samples from each station over a 30 day period. Due to the difficulty in obtaining shellfish samples and the resources required to undertake the test the consent holder has not been able to comply with the requirement and has only sampled each station on one occasion over the 30 day period.

Analyses are required for:

- Faecal coliforms,
- Enterococci bacteria, and
- Salmonella bacteria

The results of faecal coliform monitoring and salmonella monitoring of shellfish can be compared with the Health Department guidelines for human consumption. These are:

Faecal Coliforms: > 230/100g = marginal

> 330/100g = unacceptable for human consumption

Salmonella: 0 present for human consumption

The results indicate:

- Only one occasion when samples exceeded 230 faecal coliforms/100g. The peak was 490/100g.

- No salmonella have been detected in any shellfish samples.

The enterococci monitoring showed similar levels to faecal coliforms, however there is no standard set for comparison of levels.

Tauranga District Council has recently made application to reduce the microbiological shellfish monitoring frequency to two occassions per year and only one sample from the five stations over a 30 day period. They have suggested in the application that if any exceedance of the Health Department guidelines was detected, the full five samples over the 30 day period would be reinstated for the following month. This is presently under consideration.

4.1.8 Arsenic and Heavy Metal Monitoring

The consent holder is required to sample shellfish and sediment at various locations up to two kilometres from the outfall for a range of heavy metals. This sampling is required to be undertaken at two yearly intervals. To date only two sampling surveys have occurred, therefore the frequency meets consent requirements. Results are attached as Appendix II.

No comments have been made on the results of this sampling as it is the long term trends in heavy metals that are to be considered rather than the absolute levels at any point in time. Analysis and commentary on this aspect will be undertaken in future compliance reporting.

4.2 Consent 02 3803

This consent authorises the discharge of reclaimed water from the Chapel Street Sewage Treatment Plant on to land at various publicly accessible sites within the Tauranga District. At present eleven sites are authorised in the consent for the application of reclaimed water. However, only the following three sites are reticulated and used for irrigation:

- Tauranga Domain
- Sulphur Point Reserve, and
- Omanu Golf Course

The following outlines consent conditions which require monitoring:

Condition 2 Quantity of discharge (6,000 m^3/day)

Condition 3 Points of Discharge

Condition 4 Water Treatment Quality

Condition 5 Effluent Analysis

Condition 6 Effluent Monitoring

Condition 7 Irrigation Method and Control

Condition 8 Site Monitoring and Control

Condition 9 Management Plan

Condition 10 Reclaimed Water Disposal Management

4.2.1 Condition 2 – Discharge Volumes

Condition 2 authorises a total discharge volume of 6,000 m^3 per day. Condition 6.2.1 requires that the total daily volume is recorded and reported to Environment B·O·P monthly. Perusal of the file reveals that the daily discharge volume has always complied with the limit. The maximum daily discharge has been 4,429 m^3 in one day.

4.2.2 Condition 3 – Points of Discharge

Staff have inspected all areas where effluent is irrigated. The irrigated sites are listed above on page 15 and are authorised by the consent.

4.2.3 Condition 4 – Water Treatment and Quality

The consent requires that effluent be treated to tertiary standards, including U.V disinfection. Staff believe this occurs at all times at the Chapel Street Sewage Treatment Plant.

The effluent is also required to meet the following quality:

- BOD_5 not exceed 27 g/m^3
- SS not exceed 35 g/m^3
- Enterococci, not exceed 101/100 mls and the median of five cumulative values must not exceed 33/100 mls.

Perusal of the records sent to Environment B·O·P regarding water quality show the following exceedences:

- BOD exceeded 27 g/m^3 on 2 ocassions
- SS exceeded 35 g/m^3 on 1 ocassion
- Enterococci exceeded 101/100 mls on 20 ocassions

4.2.4 Condition 5 – Effluent Analysis

This condition requires:

- An easily accessible sampling point be maintained.
- A flow gauging station (5.3) where the flow from Chapel Street Sewage Treatment Plant going to irrigation can be accurately gauged, and
- Flow measurement devices used to collect flows be checked and calibrated annually and results of calibrations sent to Environment B·O·P.

Compliance monitoring reveals:

- Effluent samples can easily by collected at the outlet of the U.V. disinfection for analysis.
- Flow meters are installed at all three sites to measure flows. Environment B·O·P staff believe that this meets the requirements of condition 5.3
- However, the flow meters presently in place cannot be calibrated. Tauranga District Council is presently replacing the flow meters and installing meters which can be checked and calibrated as required by consent.

4.2.5 Condition 6 – Effluent Monitoring

The consent holder is required to collect the following data and report to Environment B·O·P monthly:

- Daily volume discharged,
- BOD_5 once weekly,
- The SS once weekly, and
- The enterococci bacteria, five samples monthly

The results are submitted as required and are reported in the discussion of condition 4.

4.2.6 Condition 7 – Irrigation Methods and Control

This condition relates to specific site requirements including:

- Method of irrigation,
- Buffer zones,
- Trial aerosol monitoring, and
- Hours of operation

Staff inspection of the sites indicates compliance with the requirements. In particular condition 7.2 withheld authorisation for effluent discharge on sites adjacent to residential areas until a full season of irrigation on a more remote site had been completed and monitoring for spray drift and aerosols had been completed. The aim of this was to allow verification of buffer zone distances by trial monitoring. The appropriate report was submitted in September 1995.

4.2.7 Condition 8 – Site Monitoring and Control

The condition requires the following:

- Records be kept regarding daily application depth and areas irrigated, and a soil moisture balance kept on each site, and surface ponding or runoff of effluent be prevented.

Staff have checked records for all three operational sites for the period February 1999. All records are maintained as required Site inspections have revealed some minor seepage from sprinkler heads at the Sulphur Point Reserve to the roadside stormwater drains. The District Council has been requested to repair the leaks and monitor to ensure no further leakage.

4.2.8 Condition 9 – Management Plan

This requires that the Tauranga District Council prepares a Management Plan for the irrigation sites. A suitable Management Plan has been submitted as requested.

4.2.9 Condition 10 – Reclaimed Water Disposal Management

This condition requires that the Tauranga District Council be responsible for the overall management of the reclaimed water, and specifically references the following:

- Maintain register of operational sites,
- Be sure that each site and the site staff can meet all conditions of the resource consent (02 3803),
- Be responsible for training of site staff,
- Tauranga District Council must undertake an audit of all irrigation sites and report results to Environment B·O·P annually,
- Keep up to date on research relating to the spread of viruses from irrigation of sewage effluent and advise Environment B·O·P of any findings that add significantly to knowledge in that field.

Environment B·O·P staff are satisfied from inspections and discussions with Tauranga District Council staff that these conditions are being met. The most recent audit report was submitted in July 1998.

Chapter 5: Summary & Conclusions

5.1 Sewage from the Tauranga District is reticulated to either of two wastewater treatment facilities. The Tauranga City is serviced by the Chapel Street wastewater treatment plant and the Mount Maunganui and Papamoa areas are serviced by the Te Maunga sewage treatment plant.

5.2 Treatment at both plants comprises activated sludge treatment followed by wetland treatment at Te Maunga. Effluent treatment at Chapel Street is disinfected by UV light prior to reticulation to the Te Maunga wetlands.

5.3 Effluent is discharged to the ocean via the Omanu outfall, or during dry periods a portion of 'reclaimed' wastewater from the Chapel Street sewage treatment plant can be utilised for irrigation of parks and reserves in the Tauranga District.

5.4 At present three sites are reticulated to receive "reclaimed" water from the Chapel Street sewage treatment plant.

5.5 Resource consent number 02 3540 authorises the discharge of treated wastewater to the ocean. Generally compliance with consent conditions is high. The following summarises areas of non-compliance with consent conditions:

- Shellfish quality in the receiving environment exceeded consent limits on only one occasion.
- The number of samples collected for shellfish monitoring have not met consent requirements on a monthly basis.

Other monitoring has indicated satisfactory performance of the treatment plants and indicated results within acceptable environmental standards (heavy metal concentrations in effluent flows).

5.6 Resource consent number 02 3803 authorises the discharge of reclaimed water to various parks and reserves in the Tauranga district. Compliance with consent conditions has been reasonable. The following summarises areas of non-compliance with consent conditions:

- Water quality has exceeded consent limits on a number of occasions. The most significant of these are 20 exceedences of the one-off bacterial standard.

- Although flow meters have been in place, they have not been calibrated as required. Tauranga District Council is presently altering flow meters so that calibration can take place in the future as required.

Appendices

Appendix I – Resource Consents

Consent Number: 02 3540

BAY OF PLENTY REGIONAL COUNCIL

RESOURCE CONSENT

Pursuant to section 105 of the Resource Management Act 1991, the **ENVIRONMENTAL MONITORING COMMITTEE** acting under delegated authority from **THE BAY OF PLENTY REGIONAL COUNCIL**, by a decision dated 28 April 1993, **HEREBY GRANTS** to:

TAURANGA DISTRICT COUNCIL

Private Bag
TAURANGA

A permit to **DISCHARGE TREATED SEWAGE FROM THE TAURANGA AND THE TE MAUNGA SEWAGE TREATMENT PLANTS INTO THE PACIFIC OCEAN** subject to the following conditions:

1 **PURPOSE**

For the purpose of discharging effluent from the treatment of domestic sewage and industrial waste originating within the Tauranga district via the Mount Maunganui outfall.

2 **QUANTITY AND RATE**

The daily discharge shall not exceed 37,000 cubic metres per day and the rate of discharge shall not exceed 440 litres per second.

3 **POINT OF DISCHARGE**

Discharge shall be into the Pacific Ocean through the existing 950 metre outfall located at map reference NZMS 260 U14 968 870 as shown in the application.

4 **OUTFALL**

4.1 The discharge shall be through a diffuser section at least 22.5 metres long.

4.2 The outfall diffuser shall be inspected at least once per annum to ensure that it is operating satisfactorily. A report on the results of the inspection shall be sent to the Regional Council within one month of inspection.

Consent Number: 02 3540

5 TREATMENT SYSTEM OPERATION AND MAINTENANCE

5.1 The waste water treatment and disposal system shall be operated and maintained at all times to ensure that the treatment is in accordance with sound engineering practices.

5.2 All effluent emanating from the Chapel Street Sewage Treatment Plant shall be disinfected prior to being pumped to the Te Maunga Sewage Treatment Plant.

5.3 Treated effluent from the Chapel Street Sewage Treatment Plant shall be treated in a wetland prior to discharge via the ocean outfall. This wetland shall have an hydraulic residence time of at least two days.

5.4 Raw sewage being reticulated to the Te Maunga Sewage Treatment Plant shall be treated in oxidation ponds and then treated in a wetland prior to discharge via the ocean outfall. The ponds shall have screens installed at the outlet to prevent gross solids passing into the wetlands and the wetlands shall have an hydraulic residence time of at least two days.

6 EFFLUENT ANALYSIS AND MONITORING

6.1 The Grantee shall maintain the following easily accessible sampling points where a representative sample of effluent can be obtained:

6.1.1 where effluent from the Chapel Street Sewage Treatment Plant enters the wetland treatment system; and

6.1.2 where the combined effluent from the wetlands effluent enters the discharge pipeline.

6.2 Effluent analyses shall be carried out as set out in the latest edition of "Standard Methods for the Examination of Water and Waste Water" APHA-AWWA-WEF or such other method as may be approved by the General Manager of the Regional Council or his delegate.

6.3 The Grantee shall maintain easily accessible flow gauging stations where:

6.3.1 The flow from the Chapel Street STP entering the wetland can be accurately gauged, and

6.3.2 The combined effluent flow from the treatment wetlands, entering the outfall pipeline can be accurately gauged.

Consent Number: 02 3540

6.4 All effluent flows required by this consent shall be measured to an accuracy of ± 5%. The Grantee shall have all flow measuring devices which are required to collect flows under conditions of this consent checked and calibrated annually by a suitably qualified person. The results of these calibration checks shall be submitted to the Regional Council within one month of the check taking place.

7 EFFLUENT QUALITY

All waste water discharge via the Omanu outfall after treatment through wetlands shall meet the following standard:

7.1 The effluent shall be substantially free from grease and oil.

7.2 The five day biochemical oxygen demand of a 24 hour flow proportional composite sample of the effluent shall not exceed 70 grams per cubic metre, nor shall the median of five consecutive samples exceed 50 grams per cubic metre.

7.3 The suspended solids concentration of a 24 hour flow proportional composite sample of the effluent shall not exceed 95 grams per cubic metre, nor shall the median of five consecutive samples exceed 65 grams per cubic metre.

7.4 The Grantee shall maintain trade waste bylaws to control the discharge of toxic substances into the sewer system.

7.5 The median enterococci bacteria concentration of five samples of the effluent taken over not more than 30 days shall not exceed 10,000 per 100 mls.

8 EFFLUENT MONITORING

8.1 The Grantee shall measure and record the following parameters and send the results to the Regional Council within one calendar month of the record or sample being collected.

8.2 Effluent shall be sampled at a point where the combined effluent from both wetland streams is mixed prior to discharge to the ocean outfall. The following shall be measured and recorded:

8.2.1 The volume of effluent discharged each day.

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8.2.2 The concentration of five day biochemical oxygen demand discharged on at least one day per week as measured by the analysis of 24 hour flow proportional composite samples.

8.2.3 The concentration of suspended solids discharged on at least one day per week as measured by the analysis of 24 hour flow proportional composite samples.

8.2.4 The concentration of total phosphorus discharged on at least one day per week as measured by the analysis of 24 hour flow proportional composite samples.

8.2.5 The concentration of ammoniacal-nitrogen discharged on at least one day per week as measured by the analysis of 24 hour flow proportional composite samples.

8.2.6 The concentration of total Kjeldahl nitrogen discharged on at least one day per week as measured by the analysis of 24 hour flow proportional composite samples.

8.2.7 The concentration of nitrate-nitrogen discharged on at least one day per week as measured by the analysis of 24 hour flow proportional composite samples.

8.2.8 The numbers of enterococci per 100 mls of five representative samples of the effluent taken within a month, each month

8.2.9 During May and December of each year, the Grantee shall collect a representative sample of effluent and analyse for the following constituents:

Arsenic
Chromium
Mercury
Lead
Cadmium
Copper
Nickel
Zinc

8.3 Replicate samples of the combined effluent shall be supplied to the Regional Council for comparative analysis as required by the General Manager of the Regional Council or his delegate.

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9 MICROBIOLOGICAL WATER MONITORING

The Grantee shall carry out a programme of microbiological water monitoring as set out below and shall send reports on the results of the monitoring to the Regional Council within one calendar month of the record or sample being collected.

9.1 Water samples shall be collected from at least 9 stations approximately 250 metres offshore of the beach adjacent to the outfall. The stations shall be sited in locations where effluent is most likely to come ashore. Sampling methods and site locations shall be as agreed by the Tauranga District Council and the Bay of Plenty Regional Council.

9.2 Analyses shall be carried out for enterococci bacteria.

9.3 Surveys shall be carried out during the months of November, January, March and July each year, subject to safe sea conditions.

9.4 Each survey shall consist of five samples from each station within a period of 30 days.

9.5 Microbiological enumeration shall be carried out using methods approved in writing by the General Manager of the Regional Council or his delegate.

9.6 Replicate samples shall be supplied to the Regional Council for comparative analysis as required by the General Manager of the Regional Council or his delegate.

9.7 The samples shall meet the following standard:

- the median enterococci value of samples taken over the bathing season, shall not exceed 35 enterococci per 100 mls and any single sample shall not exceed 101 enterococci per 100 mls.

9.8 If in any month of monitoring the water quality monitoring reveals a breach of the standard specified in condition 9.7, the Grantee shall undertake water quality monitoring in the month following the breach as specified in condition 9.1 - 9.7.

10 MICROBIOLOGICAL SHELLFISH MONITORING

The Grantee shall carry out a programme of microbiological shellfish monitoring as set out below and shall send reports on the results of the monitoring to the Regional Council within one calendar month of the record or sample being collected.

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10.1 Shellfish samples shall be collected from at least 5 stations within the tidal zone off the beach adjacent to the outfall. The stations shall be sited in locations where effluent is most likely to come ashore. Sampling methods and site locations shall be as agreed with the Tauranga District Council and Bay of Plenty Regional Council.

10.2 Analyses shall be carried out for the following bacteria:

10.2.1 faecal coliforms;

10.2.2 enterococci bacteria;

10.2.3 Salmonella bacteria;

10.3 Surveys shall be carried out during the months of November, January, March and July each year.

10.4 Each survey shall consist of five samples from each station within a 30 day period.

10.5 The samples shall meet the currently accepted Health Department guidelines for human consumption, as set from time to time. Present guidelines specify faecal coliforms and salmonella bacteria.

10.6 If in any month of monitoring the shellfish monitoring reveals a breach of the standard specified in condition 10.5, the Grantee shall undertake shellfish monitoring in the month following the breach as specified in condition 10.1 - 10.5.

11 ARSENIC AND HEAVY METAL MONITORING

11.1 The Grantee shall undertake the following shellfish and sediment monitoring in the month of January of even year until the expiry of this consent.

11.2 Shellfish and sediment samples shall be collected at varying distances around the outfall location. The location and number of sites shall be as follows:

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Collect three replicate samples of shellfish and sediment from the following locations:

- 2km north of the diffuser, and

- 20m, 100m and 1 km from the diffuser

to the satisfaction of the General Manager of the Regional Council or his delegate.

11.3 Samples of shellfish and sediments shall be analysed for the following:

Arsenic
Chromium
Mercury
Lead
Cadmium
Copper
Nickel
Zinc

11.4 The results of the shellfish and sediment arsenic and heavy metal monitoring shall be submitted to the Regional Council within two months of monitoring.

12 REVIEW OF CONSENT CONDITIONS

12.1 The Regional Council reserves the right under section 128(a)iii of the Resource Management Act 1991 to review the conditions of this consent for the following reasons:

12.1.1 If it is shown by monitoring that any parameter of the effluent quality can consistently meet a substantially higher standard than specified in condition 7 of this consent (utilising the proposed treatment methods or different means of expressing the standard), the Regional Council may specify a higher standard or different means of expressing the standard than presently specified.

12.1.2 If it is shown by microbiological water sampling that this discharge is consistently causing or substantially contributing to a breach of the contact recreation standard as specified in condition 9 of this consent, the Regional Council reserves the right to specify an improved treatment standard or disposal method to mitigate this effect.

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12.1.3 If it is shown by microbiological shellfish sampling that this discharge is consistently causing or substantially contributing to shoreline shellfish either side of the ocean outfall becoming unsuitable for human consumption, the Regional Council reserves the right to specify an improved treatment standard or disposal method to mitigate this effect.

12.2 The review process shall be as set out in sections 128-132 of the Resource Management Act 1991.

13 SURRENDER OF CONSENT NUMBER 02 0077

The Grantee shall surrender consent number 02 0077 by 31 July 1995, when the reticulation and treatment systems to meet this consent are required to be commissioned.

14 TERM

This permit to discharge shall terminate on 30 April 2005.

15 RESOURCE MANAGEMENT CHARGES

The Grantee shall pay the appropriate resource management charges under section 36 of the Resource Management Act 1991 associated with this consent.

16 **THE PERMIT** hereby authorised is granted under the Resource Management Act 1991 and does not constitute an authority under any other Act, Regulation or Bylaw.

DATED at Whakatane this 9th day of July 1993

For and on behalf of
The Bay of Plenty Regional Council

J A Jones
General Manager

Consent Number: 02 3803

BAY OF PLENTY REGIONAL COUNCIL

RESOURCE CONSENT

Pursuant to section 105 of the Resource Management Act 1991, the **ENVIRONMENTAL MONITORING COMMITTEE** acting under delegated authority from **THE BAY OF PLENTY REGIONAL COUNCIL**, by a decision dated 22 September 1994, **HEREBY GRANTS** to:

TAURANGA DISTRICT COUNCIL

Private Bag
TAURANGA

A permit to **DISCHARGE RECLAIMED WATER FROM THE CHAPEL STREET SEWAGE TREATMENT PLANT ON TO LAND AT VARIOUS PUBLICLY ACCESSED SITES WITHIN THE TAURANGA DISTRICT** subject to the following conditions:

1 **PURPOSE**

For the purpose of discharging tertiary treated, reclaimed water from the Chapel Street sewage treatment plant by spray irrigation to various publicly accessed sites within the Tauranga district.

2 **QUANTITY**

This consent authorises the discharge of up to 6,000 cubic metres per day of reclaimed water.

3 **POINT OF DISCHARGE**

SEE CHANGE: Discharge shall be restricted to ~~ten~~ eleven sites within the Tauranga District as listed below:

3.1 the Tauranga Domain - main field;

3.2 Sulphur Point Reserve - north of the BMX track;

3.3 the roadside reserves each side of the causeway to Mount Maunganui;

the grass runways at the airport;

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3.4 an area of agricultural land between the airport and the Omanu Golf Course (called the airport Reserve);

3.5 the Omanu Golf Course;

3.6 Bayfair Reserve;

3.7 Links Reserve;

3.8 the Tauranga central business district, including the Strand Gardens and a number of street verges, and

3.9 Mount Maunganui Intermediate School.

3.10 Fergusson Park Reserve. The authority to spread at this site shall terminate on 30 April 2000.

SEE CHANGE:

4 WATER TREATMENT AND WATER QUALITY

4.1 All water discharged under the conditions of this consent shall be treated to tertiary standard in the Tauranga District Council Chapel Street sewage treatment plant. The final treatment stage shall include disinfection by ultra violet light.

4.2 The reclaimed water discharged to irrigation shall meet the following quality:

4.2.1 the five day Biochemical Oxygen Demand shall not exceed 27 g/m^3;

4.2.2 the Suspended Solids concentration shall not exced 35 g/m^3, and

4.2.3 the enterococci bacteria concentration shall not exceed 101 per 100 mls and the median value of any five consecutive samples shall not exceed 33 per 100 mls.

4.3 The Grantee shall maintain trade waste bylaws to control and minimise the discharge of toxic substances into the sewer system.

5 EFFLUENT ANALYSIS

The Grantee shall maintain an easily accessible sampling point where a representative sample of reclaimed water can be obtained.

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5.1 Effluent analyses shall be carried out as set out in the latest edition of "Standard Methods for the Examination of Water and Waste Water" APHA-AWWA-WEF or such other method as may be approved by the General Manager of the Regional Council or his delegate.

5.2 The Grantee shall maintain an easily accessible flow gauging station where the flow from the Chapel Street STP being disposed to irrigation can be accurately gauged.

5.3 All effluent flows required by this consent shall be measured to an accuracy of ± 5%.

5.4 The Grantee shall have all flow measuring devices which are required to collect flows under conditions of this consent checked and calibrated annually by a suitably qualified person. The results of these calibration checks shall be submitted to the Regional Council within one month of the check taking place.

6 EFFLUENT MONITORING

6.1 The Grantee shall measure and record the parameters listed in condition 6.2 and send the results to the Regional Council within one calendar month of the record or sample being collected.

6.2 The following shall be measured and recorded during the irrigation season:

6.2.1 The total volume of effluent discharged to irrigation daily.

6.2.2 The concentration of five day biochemical oxygen demand discharged on at least one day per week as measured by the analysis of 24 hour flow proportional composite samples.

6.2.3 The concentration of suspended solids discharged on at least one day per week as measured by the analysis of 24 hour flow proportional composite samples.

6.2.4 The numbers of enterococci bacteria per 100 mls of five representative samples of the effluent taken within a month, each month.

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7 IRRIGATION METHODS AND CONTROL

7.1 The method of application of reclaimed water at each site shall be as detailed in the application.

On all sites except the Airport Reserve the method of application may be medium pressure gear driven sprinklers, or low pressure micro irrigation, mini sprinklers, jets, or subsurface irrigation.

On the Airport Reserve irrigation shall be by low pressure, boom irrigator. The design shall include measures to minimise spray drift and aerosols. The final design of the boom irrigator shall be approved by the General Manager of the Regional Council or his delegate prior to it being commissioned.

7.2 The Grantee shall not irrigate effluent to the following sites until:

7.2.1 at least one less critical site has been operated for a full irrigation season,

7.2.2 the spray drift and aerosol monitoring as detailed in condition 8.4 has been completed and reported to the Regional Council, and

7.2.3 final buffer zone distances for these sites have been agreed between the General Managers of the District Council and the Regional Council, or their delegates:

7.2.4 the Bayfair Reserve;

7.2.5 the Links Reserve; and

7.2.6 the Mount Maunganui Intermediate School.

7.3 The following minimum buffer zone distances shall apply.

Note: A buffer zone is measured from the outside wetted diameter of a sprinkler or jet to the boundary of concern.

Around all open waterways a buffer zone of 20 m shall apply, except on the Omanu Golf Course where irrigation nozzles directed away from the water course may be within 5 metres of the central water course.

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7.3.1 Around any ground water bore used for domestic consumption a buffer zone of 20 m shall apply.

7.3.2 Around property boundaries the buffer zone distances shall be:

7.3.2.1 10 m where medium pressure sprinklers are used; or

7.3.2.2 5 m where low pressure sprinkler or drip irrigation is used, and

7.3.2.3 0.5 metre where subsurface irrigation is used.

7.3.3 During the first year of operation a minimum buffer zone distance of 25 m to any residential property shall be maintained. Thereafter the minimum buffer zone distances will default to the above unless aerosol monitoring undertaken in condition 8.4 reveals problems which indicate that a 25 m buffer zone to residential properties should be maintained.

7.3.4 On the north west boundary of the Airport adjacent to Mrs Hirama's property a 150 m buffer zone shall be maintained.

7.4 Any sprinklers within 50 m of any residential boundary must be quiet gear or piston driven medium pressure sprinklers or mini sprinklers.

7.5 All irrigation shall take place at night time between the hours of 7 pm to 7 am, except on the Airport Reserve and Fergusson Park Reserve where irrigation may take place at any time.

SEE CHANGE:

7.6 The Grantee shall erect and maintain prominent signs at all sites warning the public that reclaimed water is irrigated at each site.

7.7 The irrigation systems shall be monitored and controlled by automated mechanisms to immediately curtail any irrigation cycle where wind is causing spray drift onto neighbouring properties, or breaching buffer zone distances.

SEE CHANGE:

7.8 Up to 30 cubic metres per day of reclaimed water may be irrigated on the Te Maunga Tip site and roads to suppress dust. The method of application shall be by mobile tanker and water shall be discharged by gravity from a horizontal spreader bar no greater than one metre above the ground. The authority to spread at the land fill site shall terminate on 31 January 1996.

7.9 Water used at Fergusson Park Reserve shall be for dust suppression and establishing grass. The method of application shall be by mobile tanker and water shall be discharged by gravity from a horizontal spreader bar no greater than one meter above the ground.

SEE CHANGE:

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8 SITE MONITORING AND CONTROL

8.1 The manager at each irrigation site shall record and maintain the following records:

8.1.1 A daily soil moisture balance over the irrigation season, or use other suitable technology to measure and record soil moisture deficit.

8.1.2 A log of daily water applications including application depth, duration and block irrigated.

These records shall be made available to the Regional Council or Tauranga District Council staff on request.

8.2 The irrigation application shall only be used to control soil moisture deficits. Water shall not be applied to areas which are not in moisture deficit and applications shall not increase soil moisture levels above field capacity.

8.3 The application of reclaimed water shall not result in surface ponding or run off to watercourses.

8.4 During the first year of irrigation operation the Tauranga District Council shall design and undertake a study monitoring the effect of irrigation spray drift and aerosol transport from the operational sites. A monitoring programme shall be submitted to the Regional Council for approval prior to commencing the programme. It shall include:

- monitoring of aerosol and spray drift movement under varying wind conditions to test modelling predictions submitted with the application,
- details of maximum spray drift and aerosol movement,
- details of complaints or problems received by the site operators or Tauranga District Council regarding spray drift and aerosols from sites, and
- a reassessment of buffer zone distances in view of the monitoring programme and operational experience.

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9 MANAGEMENT PLAN

9.1 Within six months of this consent being granted the Tauranga District Council shall prepare a management plan for the irrigation sites. This plan shall include all requirements of this consent pertaining to each irrigation site. A copy of the plan shall be submitted to the Regional Council and at least one copy held at Tauranga District Council and each irrigation site.

9.2 Each irrigation site shall have one person nominated as the irrigation manager responsible for ensuring that conditions of the Management Plan are adhered to on each site. The Tauranga District Council shall notify the Regional Council in writing the names of irrigation managers for each site.

10 RECLAIMED WATER DISPOSAL MANAGEMENT

The Tauranga District Council shall be responsible for the overall management of the irrigation of reclaimed water. Specifically they shall undertake the following:

10.1 Maintain a register of the operational irrigation sites.

10.2 Before the Tauranga District Council authorises a site for irrigation of reclaimed water it must be satisfied that the site and the site staff can meet all conditions of this consent.

10.3 Tauranga District Council staff shall be responsible for training of individual irrigation site staff to ensure that they understand and comply with the Management Plan.

10.4 The Tauranga District Council shall undertake an annual audit of all irrigation sites using the reclaimed water to ensure that all sites comply with the Management Plan. A report on this audit shall be submitted to the Regional Council by 31 July each year. This report shall detail any areas of each system which do not comply with the plan and any actions taken to amend problems causing non-compliance.

10.5 The Grantee shall keep up to date on research related to the spread of viruses from irrigation of sewage effluent and shall advise Regional Council of any findings that add significantly to knowledge in that field.

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11 REVIEW OF CONSENT CONDITIONS

The Regional Council may, under s 128 (1)(a)(iii) of the Resource Management Act 1991, serve notice on the Grantee of its intention to review the conditions of this consent relating to buffer conditions. The purpose of such a review is to impose appropriate buffer zone distances to protect the health of and avoid nuisance to irrigation site neighbours.

Notice of such review may be given at any time after receipt of aerosol and spray drift monitoring results which show that the buffer zone distances specified in this consent are insufficient to ensure that nuisance conditions or a health hazard do not occur on neighbouring properties.

12 TERM

This permit shall terminate on 30 April 2005.

13 RESOURCE MANAGEMENT CHARGES

The Grantee shall pay the appropriate resource management charges under section 36 of the Resource Management Act associated with this consent.

14 **THE PERMIT** hereby authorised is granted under the Resource Management Act 1991 and does not constitute an authority under any other Act, Regulation or Bylaw.

DATED at Whakatane this 14th day of November 1994

For and on behalf of
The Bay of Plenty Regional Council

J A Jones
General Manager

Consent Number : 02 3803

CHANGE

The change of this resource consent was approved under delegated authority of the Bay of Plenty Regional Council, dated 16 December 1994, as follows:

Add a condition 7.8 as follows:

Up to 30 cubic metres per day of reclaimed water may be irrigated on the Te Maunga tip site and roads to suppress dust. The method of application shall be by mobile tanker and water shall be discharged by gravity from a horizontal spreader bar no greater than one metre above the ground. The authority to spread at the land fill site shall terminate on 31 January 1996.

R B GARDNER
Manager Environmental Regulation and Monitoring

for J A JONES
General Manager

CHANGE

The change of this resource consent was approved under delegated authority of the Bay of Plenty Regional Council, dated 23 December 1998, as follows:

Condition 3 shall have the word "ten" replaced with "eleven".

A new condition 3.11 "Fergusson Park Reserve. The authority to spread at this site shall terminate on 30 April 2000."

Condition 7.5 shall have the words "and Fergusson Park Reserve" inserted after the word "Reserve".

A new condition 7.9 "Water used at Fergusson Park Reserve shall be for dust suppression and establishing grass. The method of application shall be by mobile tanker and water shall be discharged by gravity from a horizontal spreader bar no greater than one meter above the ground."

R B Gardner
Manager Consents & Compliance

For J A Jones
Chief Executive

Appendix II – Arsenic and Heavy Metal Monitoring