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Report to the Rural Services and Wairarapa Committee
from B Stansfield, Water Quality Scientist

Annual Wairarapa Municipal Oxidation Pond Report

1. Purpose

To report to the Committee, the results of the Wairarapa municipal oxidation pond monitoring programme for the period 26 July 1998 to 24 June 1999.

2. Background

2.1 Special conditions attached to the discharge permits for the Wairarapa municipal oxidation ponds require the monitoring of their pond performance. This involves monthly wastewater analysis.

2.2 In addition to this onsite monitoring programme, the Wellington Regional Council has a monitoring programme which focuses on the impacts of the treated effluent discharges to the receiving water bodies. This involves monthly sampling both upstream (site 1) and downstream (site 2) of the discharge points.

3. Objectives

The main objectives of this report are:

1. To provide information on the effluent quality from the municipal oxidation ponds of the Wairarapa.
2. To provide information on the quality of the water bodies receiving these oxidation pond discharges.
3. To provide comparisons of the different municipal oxidation pond effluents and their receiving waters.

4. Methods

4.1 The five municipal oxidation ponds monitored in the Wairarapa are:

<u>Pond</u>	<u>Receiving Water</u>
Masterton	Makoura Stream / Ruamahanga River
Carterton	Mangatarere River
Greytown	Papawai Stream
Martinborough	Ruamahanga River
Featherston	Donald's Creek / Lake Wairarapa

4.2 The sampling consists of

- Monthly sampling for chemical and microbiological water quality variables
- Annual sampling of macroinvertebrates

Dissolved oxygen, (percentage saturation and concentration) and temperature are measured in the field. Biological oxygen demand, suspended solids, conductivity, pH turbidity, nutrients, E.coli and faecal coliforms are analysed in the laboratory.

The structure of the Macroinvertebrate Community is summarised by the Macroinvertebrate Community Index (MCI) and its quantitative analogue (QMCI).

In some instances comparisons have been made with water quality sites from the Baseline Rivers Water Quality Monitoring Programme.

5. Results & Discussion

- 5.1 The water quality of the Martinborough oxidation pond effluent was significantly poorer than the other sites. This is expected as the Martinborough oxidation ponds have the most simple design (single pond).
- 5.2 Although the Martinborough oxidation pond effluent was significantly poorer than the other sites, the effects of the discharge on the receiving water (the Ruamahanga River) was often less than the other sites. This is because the Martinborough oxidation ponds have a low volume of discharge and the receiving water offers greater dilution. Improvements in effluent water quality at the Martinborough oxidation pond outfall have been observed since the installation of mechanical aerators in August 1998.
- 5.3 The Makoura 2 site (located downstream of the Masterton Oxidation Ponds outfall) had significantly poorer water quality compared to other receiving waters. This result is consistent with previous annual reports.
- 5.4 The MCI and QMCI results showed that the receiving waters for the Carterton and Martinborough oxidation ponds (Mangatarere River and Ruamahanga River respectively), had good water quality upstream and downstream of these outfalls. Conversely the same results for the Masterton and Greytown oxidation pond receiving waters, showed that

the out fall to these ponds were having a significant impact on their receiving waters (Makoura Stream and Papawai Stream respectively). The previous years annual report also found the Featherston oxidation ponds to have significantly poorer water quality downstream.

- 5.5 The following table indicates significant changes identified along the receiving waters of each municipal oxidation pond of the Wairarapa for the past three years.

Variable	Masterton Makoura	Masterton Ruamahanga	Carterton Mangatarere	Greytown Papawai	Martinborough Ruamahanga	Featherston Donald's Creek
BOD	⊗⊗⊗	⊗⊗⊗		⊗⊗		⊗⊗⊗
TN	⊗⊗⊗					⊗⊗⊗
Total NH ₃	⊗⊗⊗	⊗⊗⊗	⊗⊗⊗	⊗⊗⊗	⊗	⊗⊗⊗
DN	⊗⊗⊗					⊗
TP	⊗⊗⊗	⊗⊗⊗	⊗⊗⊗	⊗⊗⊗		⊗⊗⊗
DRP	⊗⊗⊗	⊗⊗⊗	⊗⊗⊗	⊗⊗⊗	⊗⊗⊗	⊗⊗⊗
Turbidity	⊗⊗⊗	⊗				⊗⊗
% Saturation	⊗⊗⊗					⊗⊗⊗
Invertebrate Community	⊗⊗⊗			⊗⊗		⊗⊗

- 5.6 Seasonal patterns have been observed in terms of effluent quality of all the municipal ponds. Most notable is the seasonal concentrations of total phosphorus and total ammonia.
- 5.7 Time series trend analysis of four key water quality variables (total phosphorus, total nitrogen, total ammonia and faecal coliforms) show that the Masterton oxidation ponds and Greytown oxidation ponds have shown increasing total nitrogen concentrations at the outfall and the downstream receiving waters over the past 3 years. The Greytown oxidation ponds also show increasing total phosphorus concentrations at the outfall and the downstream receiving waters.
- 5.8 Renewal of consents for the Wairarapa municipal oxidation ponds are likely to require that the water quality of the receiving tributaries is improved. This report indicates which water quality variables need to be focused upon. The seasonal loadings are an important consideration to focus upon as improvements to water quality of the receiving waters may involve seasonal or continuous discharges to land.

6. Communication

The full report has been provided to each District Council. No additional publicity is proposed.

7. Recommendation

1. *That the report be received*
2. *That the current renewal of consents take into consideration the water quality variables indicated in this report so that improvements to water quality can be attained as defined by the Regional Policy Statement*
3. *That the water quality monitoring of the Wairarapa oxidation ponds continue.*
4. *That future technical reporting of the Wairarapa oxidation ponds be reported every three years while maintaining the standard Committee and consent holder annual reporting.*

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