

**BEFORE A HEARINGS PANEL OF THE GREATER WELLINGTON REGIONAL  
COUNCIL AND MASTERTON DISTRICT COUNCIL**

**IN THE MATTER** of resource consent applications to  
Greater Wellington Regional Council  
pursuant to section 88 of the Resource  
Management Act 1991

**AND**

**IN THE MATTER** of a Notice of Requirement to  
Masterton District Council pursuant to  
section 168, 168A and 181 of the  
Resource Management Act 1991

**BY** Masterton District Council

**FOR** the proposed upgrade of the Masterton  
Wastewater Treatment Plant

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**STATEMENT OF SUPPLEMENTARY EVIDENCE OF GREGORY IAN RYDER  
ON BEHALF OF MASTERTON DISTRICT COUNCIL**

**SUBJECT AREA: PEER REVIEW OF RIVER ECOLOGICAL ASPECTS**

**RESPONSE TO OFFICERS' REPORT**

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## **1. INTRODUCTION**

- 1.1** I have read the s42A Officer's Report and the supporting report titled "Technical review of discharges to surface water". I have also viewed the responses to these reports by Drs Cooke and Hickey. They have addressed a number of issues relating to the effects of the proposed discharge on the receiving environment and matters relating to monitoring. I will limit my comments to several matters relating to consent limits and monitoring.

## **2. Discharge rates**

- 2.1** The Officer's report has expressed concern over the proposed increase in the instantaneous maximum rate of discharge of treated effluent to the Ruamahanga River (from the existing 700 L/s to 1,200 L/s). The Officers have recommended the 700 L/s figure be maintained for the new discharge. In my opinion, the focus should be on managing the effects associated with the discharge rather than the magnitude of the discharge. In this case, I consider the approach to managing the effects of the rate of discharge has been adequately addressed by the proposed method of discharge, the timing of the discharge in relation to river flows and season, and consideration to the likely effects of the discharge on aquatic biota. Dr Hickey has already addressed these aspects.

## **3. Proposed limits on bioavailable phosphorus**

- 3.1** The Officer's recommended limit on bioavailable phosphorus (DRP) concentration of 0.012 mg/L appears to be highly conservative and they disagree with the Applicant's use of a 0.03 mg/L receiving water target and how this has been derived. Dr Hickey has already described this in detail and I agree with him that the way the ANZECC guidelines have been used by the Officers is inappropriate in this instance. Dr Hickey and his colleagues have derived site-specific nutrient criteria for the Ruamahanga River based in its physical and chemical attributes (including flow dynamics, upstream water quality, gradient, algae accrual rates, etc). This approach has been tailored to the local characteristics of the River whereas the ANZECC guidelines use a generic approach and assume stable low flow situations.
- 3.2** Importantly, the proposed reduction in bioavailable phosphorus concentration under summer low flow conditions (a 93% reduction for flows less than the median) should be viewed as a substantial improvement over the existing situation. The Reporting Officers have highlighted the fact that bioavailable phosphorus concentration may increase under river flow conditions greater than the median flow, and by inference this should be regarded as a potential adverse

effect. However this assessment ignores the high frequency of significant flood events during summer periods that will act to scour significant periphyton growths from the river bed and rapidly transport nutrients down the catchment to the sea. It is also important to appreciate that the discharge of nutrients will be occurring at flows where nutrients will be carried rapidly downstream. This is in contrast the current continuous discharge where, nutrients are added in significant quantities at low flows and at flows where temperatures and water clarity will be high. All of these factors mean the current discharge has significant potential for causing undesirable growths. However whilst there is certainly some stimulation of growth, those growths seldom reach nuisance levels.

**3.3** The Reporting Officers recommend receiving water limits for dissolved nutrient concentrations and maximum daily loads “*to safeguard against the stimulation of periphyton growths*”. As I have already stated above and in my evidence in chief the existing discharge appears to have relatively minor and localised effects on the development of downstream nuisance periphyton growths, and the removal of a direct discharge to the river in summer when flows drop below the median is in my opinion likely to further reduce the opportunities for nuisance growths to develop. I concur with the analysis of Drs Cooke and Hickey that direct discharges during higher flows will provide little opportunity for nutrient uptake by periphyton and this, in association with the rapid transport of water downstream, will inhibit the development of nuisance growths. The effluent standards have been back calculated to ensure that instream needs are met. Therefore I see little reason for setting receiving water standards for nutrients (as provided in draft condition 19). In my opinion it is more important to monitor the primary potential effect of nutrient discharges, and that is periphyton cover on the river bed.

**3.4** I do not consider that instream standards are necessary for the discharge. However if they do remain, the standard used for DRP should be 0.03 mg/L after reasonable mixing and should only apply at summer flows below median flow.

#### **4. Mixing zone**

**4.1** The Officer’s report recommends a 200 metre long mixing zone while the Applicant has sought 300 metres. The Officer’s report states that 200 metres is appropriate given the Applicant’s modelling results and mixing zones specified on other wastewater discharges. I do not consider it appropriate to take into account the size of mixing zones of ‘other’ discharges, as each discharge should be assessed on its merits including any relevant site-specific factors. Given the size of the Ruamahanga River, the location of the proposed outfall, which I understand is situated in an area that has limited public access, the nature of the outfall (being a diffuser) and the low risk of toxicity effects within the mixing zone (as accepted

by the Reporting Officers), I see no compelling reason why in this instance a 300 metre mixing zone is inappropriate and I agree with Dr Cooke that the discharge can be considered to be reasonably mixed at this point (about 66-70% mixed). Regarding the indirect flow of contaminants to the river from the land disposal area, ponds and Makoura Stream, I understand that it is not complete until downstream of the Maokoura Stream confluence. Accordingly, any instream monitoring and/or standards in relation to these sources and their interaction with the diffuser discharge would be best measured at Wardells Bridge.

## **5. Monitoring**

- 5.1** The Reporting Officers have proposed a significant amount of water quality and ecology monitoring associated with the proposed upgrade. While I am a strong supporter of receiving water monitoring programmes, the Reporting Officer's proposed monitoring is very wide-ranging and intensive and would require significant resources without necessarily providing any additional information on environmental effects. With respect to ecological monitoring in the Ruamahanga River, I consider it sufficient to monitor at three sites, one upstream of the direct discharge and influence of the land disposal system, a site 300 metres downstream of the diffuser outfall and a site at Wardells Bridge. Additional sites are in my opinion unnecessary provided the three sites I have recommended are similar in physical character.
- 5.2** The frequency and methodology of biological monitoring as recommended by the Reporting Officers (draft condition 23) is in my opinion appropriate and is similar to what I have undertaken elsewhere.

Greg Ryder  
24 February 2009