

**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

**STATEMENT OF EVIDENCE OF DAVID HOPMAN
ON BEHALF OF MASTERTON DISTRICT COUNCIL**

Subject Area: Background and improvements associated with the current proposal and discussion of inflow and infiltration

1. INTRODUCTION

1.1 My name is David Richard Hopman and I am the Manager of Assets & Operations at the Masterton District Council. I have an honours degree in engineering with a 20 year background in the design, project management and commissioning of a range of projects including wastewater treatment plants both in New Zealand and the UK.

1.2 I have recently joined the Masterton District Council and my roles include the management of the Masterton Wastewater Treatment Plant Upgrade Project and its subsequent operation.

1.3 My evidence is structured as follows:

- (a) scope of evidence;
- (b) executive summary;
- (c) the existing site and the need for the long-term upgrade;
- (d) background to the current proposal;
- (e) infiltration and inflow; and
- (f) conclusion.

2. SCOPE OF EVIDENCE

2.1 The current resource consent applications and Notice of Requirement seek to allow for the construction, operation and maintenance of the proposed Masterton Wastewater Treatment Plant (**MWTP**) upgrade. In my evidence I will provide a general background to the development and improvements resulting from the proposed upgrade of the MWTP from the Masterton District Council's (**Council**) perspective. I will also discuss the ongoing efforts to address infiltration and inflow.

3. EXECUTIVE SUMMARY

3.1 In summary, the key improvements of the proposed upgrade are as follows:

- (a) The microbial load at Wardells Bridge from the WWTP discharge in summer will be eliminated **below median** river flows. Above median flows the microbial load will be reduced from the current levels, producing a median *E.coli* concentration increase of approximately 10 cfu/100ml. Note that the MoH guideline level for acceptable water quality for swimming is to have no single sample greater than 260 *E.coli* /100mL.

- (b) Other water quality issues at Wardells Bridge and Makoura Stream attributed to the existing MWTP discharge such as clarity, algae settling and nuisance growths will be eliminated.
- (c) The annual WWTP nutrient loading on the Ruamahanga River will be reduced by 40%. This will reduce the total river nitrogen load from a peak of 3% to 1-2% and reduce the total phosphorus load from a peak of 8% to 2-5%.
- (d) The instantaneous phosphorus load from the WWTP on the river during periods of low flow will be reduced from a peak of 43% to less than 3%. This reduction will significantly reduce the potential of downstream nuisance growths.
- (e) The construction of new clay lined ponds of modern design to replace the existing ponds will significantly reduce pond leakage, optimise the treatment of effluent and avoid the need for flood and erosion protection of the existing ponds.
- (f) The design provides a public controlled and owned scheme to maximise the land treatment of effluent. The design utilises modern automated control technologies with a proven irrigating system for municipal wastewater. The design also minimises the discharge to the Ruamahanga River, without producing significant environmental impacts, at an affordable cost to the Masterton ratepayers.
- (g) The proposed upgrade allows for future third party use of the treated effluent without risking potential operational or environmental consequences of any commercial arrangements failing, or the imposition of uneconomic constraints on the use of the treated effluent. This third party use, combined with ongoing network improvements, will over time further reduce the volume of river discharges required.
- (h) The proposed upgrade will have a long asset life and has additional land available for land treatment in the future if required. This, combined with the commitment to an ongoing programme of I/I investigation, renewals, maintenance and capital works, mean that the proposed upgrade will provide Masterton with a long term solution for sewage treatment.

The 2003 upgrade involved the construction of a maturation cell within the third pond to further reduce the bacterial levels in the treated wastewater.

- 4.4** The treated effluent discharged is typically in compliance with the Ministry for the Environment, Ministry of Health (MoH) and ANZECC Guidelines but the river is more vulnerable to the discharge during periods of low flows.
- 4.5** Issues attributed to the MWTP during periods of low flows are the reduction in water quality at Wardells Bridge including reduced clarity, algae settling, potential for nuisance growths between freshes, and occasional increases in micro organism concentrations above the 2003 MoH Guidelines recommended limit for swimming.
- 4.6** Other issues attributed to the MWTP are the general reduction of water quality in the Makoura Stream because of the existing discharge location and the increased nutrient loading in the Ruamahanga River with the potential to cause nuisance growths downstream.
- 4.7** The total nutrient loading increase in the Ruamahanga River caused by the MWTP is measured at up to 3% for nitrogen and up to 8% for phosphorus on an annual basis. The MWTP is also estimated to contribute up to 43% of the total phosphorus load on the river during periods of low flow.
- 4.8** Under the current regional resource consent WAR 020074, the Council is required to implement the long-term upgrade and obtain relevant resource consents for its wastewater treatment plant by 2010. There is also an expectation from the community that the discharge will be upgraded, and that the discharge to land will be maximised to the extent that is practicable and cost effective. The Council has regarded the 2010 timeframe as a desirable goal rather than a legal requirement but has been working towards getting the upgrade in place as soon as possible. Last year the Council decided to amend the proposal to take advantage of the additional land purchase to build new lined ponds. That has delayed the project by a year but reflects community desires.
- 4.9** Since 2003 the Council has undertaken and commissioned a number of detailed environmental, economic and technical investigations to identify the most effective upgrade option to satisfy the Council's environmental, economic and social objectives. These objectives are outlined in Mr Ten Hove's evidence and investigations and further details of the above issues will be covered by the expert witnesses.

5. BACKGROUND TO THE CURRENT PROPOSAL

The original proposal

- 5.1** In 2005 the Council evaluated various options for the upgrade of the MWTP. The scheme that was initially chosen involved upgrading the existing oxidation ponds and developing a land treatment scheme (by way of border type irrigation), on the 91 ha of land purchased by the Council in 2004. This option was considered to best meet the Council's overall objective to "*provide a sustainable long-term solution for the treatment and disposal of Masterton's wastewater*".
- 5.2** In March 2007 the Council purchased a 107 ha land block adjacent to the site of the existing proposed land disposal area, for the future disposal of treated wastewater to land. This purchase is consistent with Council's objectives and maximises the volume of land disposal to the extent that it is practicable and cost effective.
- 5.3** At the time of the purchase, the Council had not formed a view as to how much of that new land might be used for land treatment. Therefore the land was leased back to the vendor until 2010 to allow time for further investigations and consenting of the additional land area.
- 5.4** The Council subsequently lodged resource consent applications in May 2007 with GWRC for developing the land treatment scheme on the 91 ha site. The applications noted that separate applications would be made for the additional 107 ha site once technical investigations had been carried out. The Council also extended the Notice of Requirement to enable the future use of the 107 ha block for the irrigation of treated wastewater to land.
- 5.5** Over 60 submissions were received in relation to those applications and the Notice of Requirement. Some of the concerns raised by submitters included erosion and flooding risks due to the location of the existing ponds, leakage from the unlined ponds, potential effects on groundwater and water quality, and operation of the land based treatment scheme.

Review of the proposed scheme

- 5.6** The availability of the additional 107 ha of land opened up several options, including the construction of new ponds and increasing the extent of the irrigation area, which were not viable with the original 91 ha site. Construction of new ponds had been carefully considered in the past but was not considered feasible because new ponds on the 91 ha site would have reduced the available irrigation area from 75 ha to 42 ha.
- 5.7** Submissions during the consent process for the original scheme expressed concerns with erosion and flooding risks due to the location of the existing ponds and leakage from these unlined ponds. The purchase of the 107 ha site provided an opportunity for the Council to address these issues by replacing the existing ponds with fully engineered and lined ponds, albeit at an additional cost.
- 5.8** The Council re-evaluated seven options for the construction of new oxidation ponds, either on the 91 or the 107 ha site, and various adjustments to the land treatment location. A description and evaluation of the options is reported in detail in *Masterton Wastewater Upgrade Project: Review of Pond Irrigation Area Options Incorporating Additional Land* (Beca 2008)

The current proposal

- 5.9** In December 2007 the Councillors unanimously selected the current proposal. The current proposal involves constructing new clay lined ponds on the 91 ha site directly to the northwest of the existing ponds, decommissioning the existing ponds and developing a land treatment scheme on the remainder of the 91 ha site. The 107 ha site is being partially developed for land treatment, with the balance of the site remaining available for further effluent treatment if future un-forecasted industrial or population growth occurs.
- 5.10** The scheme maximises sustainable land irrigation on the best of the land at the site available for that, with the option of expanding that in future years. The aim is to eliminate discharges to the river when the receiving river environment is most sensitive, and thereby largely avoid adverse effects on the river. The discharge of treated effluent to the Ruamahanga during the summer (from 1 November to 30 April) will only be during freshes (at times when there are sustained flows above median flow) and during winter will only be at flows above half median. As will be discussed by others, the consequence will be that there will be no more than minor adverse effects

on the ecological and amenity values of the river. It is accepted that there will be a residual impact in terms of the mauri of the river.

- 5.11** When treated effluent discharge does occur, it will be at a controlled 30 fold dilution rate through a rock diffuser located on the Ruamahanga River bed. As will be discussed by others, the improved pond treatment, the diffuser, and the shifting of the discharge point will all contribute to mitigating the effects of the residual discharge.
- 5.12** In addition, the installation of new lined ponds will significantly reduce leakage to the river via groundwater. That and the elimination of discharges at summer low flows will ensure that the disposal system will significantly reduce the current minor health risks to an insignificant level.
- 5.13** The microbial load at Wardells Bridge from the WWTP in summer will be virtually eliminated below median river flows. Above median flows the microbial load will be reduced from the current levels, producing a median *E.coli* concentration increase of approximately 10 cfu/100ml. Note that the MoH guideline level for acceptable water quality for swimming is to have no single sample greater than 260 *E.coli* /100mL. Other water quality issues at Wardells Bridge and Makoura Stream attributed to the MWTP discharge such as clarity, algae settling and nuisance growths will be also be eliminated.
- 5.14** The annual WWTP nutrient loading on the Ruamahanga River will be reduced by 40%. This will reduce the total river nitrogen load from a peak of 3% to 1-2% and reduce the total phosphorus load from a peak of 8% to 2-5%. The instantaneous phosphorus load from the WWTP on the river during periods of low flow will be reduced from a peak of 43% to less than 3%. This reduction will significantly reduce the potential of downstream nuisance growths.
- 5.15** The key features of the scheme are discussed in the evidence of Humphrey Archer and the other witnesses, and are presented in the *Assessment of Effects on the Environment and Masterton Wastewater Upgrade, Preliminary Design Report New Oxidation Ponds* (Beca April 2008). Policies have now also been adopted by the Council to provide a basis for the treated effluent to be utilised by third parties as an irrigation/nutrient resource in the future.

6. COUNCIL EFFORTS TO ADDRESS INFILTRATION AND INFLOW

- 6.1** The average flow into the MWTP is significantly higher than one would expect from a township with a population of almost 18,000 people. This is caused by the relatively high rate of infiltration and inflow (**I/I**) into the sewer system from rainfall and high groundwater levels.
- 6.2** Much of the Masterton sewer network was constructed in the period from 1910 to 1916 and is therefore approaching 100 years old. However, other sections constructed more recently in the mid 20th century, while performing adequately for reticulation, are also proving to have high I/I. Studies have shown that I/I is widespread across Masterton and, to achieve significant reductions in flows, a majority of the reticulation network will require repair or replacement.
- 6.3** The total replacement cost of the public part of the wastewater network is estimated to be approximately \$80m, and the private sections of laterals are estimated to have a replacement value of \$35m. Accordingly, replacement of the sewer network is not affordable for the community. However, the Council is committed as part of its ongoing asset management strategy to progressively upgrade areas of the reticulation system that are significantly under performing in terms of I/I.
- 6.4** Masterton's long-term goals for the urban wastewater infrastructure have been developed, in collaboration with the community, over an extended period of time. They form the basis for the operational and capital expenditure strategies set out in the Council's 2009-2019 Long Term Council Community Plan (**LTCCP**). Approximately \$15 million has been allocated in the LTCCP for I/I investigations, renewals, maintenance and capital works over the next ten years, with additional capital expenditure able to be added for specific projects.
- 6.5** Extensive work has already been undertaken by the Council to identify the areas of the network that require upgrading or repair.¹ These areas have been categorised in terms of severity and are being scheduled into the ongoing programme of works. However it is important to appreciate that this expenditure on I/I will not eliminate the need to discharge to the river. Network expenditure in the order of \$50 million would be required to eliminate river discharge at the WWTP. This cost estimate is discussed further in the evidence of Malcolm Franklin.

¹ Beca (March 2004c). *Technical Memorandum 4 Collection System Study – Final Report* (Prepared for Masterton District Council), Beca Carter Hollings & Ferner Ltd.

7. CONCLUSION

- 7.1** I have outlined the key environmental improvements resulting from the upgrade. In my opinion, the current proposal is the best option in terms of achieving the project's and the Wellington Region Freshwater Plan objectives, at a cost that is acceptable to the community.

David Hopman
Manager Assets and Operations
Masterton District Council
13 February 2009