

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

[GWRC Ref: WAR 090066]

In the matter of a resource consent application to Greater Wellington
Regional Council pursuant to section 88 of the Resource
Management Act and its Amendments.

&

In the matter of a Notice of Requirement to Masterton District Council
pursuant to section 168 of the Resource Management
Act and its Amendments.

By Masterton District Council

For The Proposed upgrade of the Masterton Wastewater
Plant

**ADDITIONAL EVIDENCE OF NEAL BORRIE
ON BEHALF OF MASTERTON DISTRICT COUNCIL
RESPONSE TO SUBMISSIONS**

Subject Area: Land Treatment System

1. INTRODUCTION

- 1.1 This supplementary evidence provides responses to issues that have been raised in the evidence presented by submitters. My statement will address issues raised about the land treatment system.

2. COMMENTS ON ISSUES RAISED BY SUBMITTERS

Reference: Andrew Stewart paragraph 5.70, page 27

Concern:

Mr Stewart expresses concerns about the choice of border strip irrigation.

Response:

- 2.1 The choice of border strip irrigation instead of spray irrigation was made after consideration of a range of factors as outlined in my evidence at paragraphs 5.1 to 5.24 inclusive and paragraphs 7.3 and 7.4.

Reference: Andrew Stewart paragraphs 5.72 and 5.73, page 27

Concern:

Mr Stewart expresses concern that effluent collected in the wipe-off drains will enter the groundwater with little or no treatment.

Response:

- 2.2 This issue will be addressed in Mr Archer's final response evidence..

Reference: Andrew Stewart paragraph 5.74, page 27

Concern:

Mr Stewart questions why the applicant wants to remove from the draft consent conditions any control over the evenness of application rates.

Response:

- 2.3 The reason why the applicant wants to remove draft consent conditions relating to the control of the evenness of application uniformity is that it would not be practicable to numerically measure application uniformity in a border strip irrigation system. However application uniformity would be assessed visually to ensure that the applied wastewater is spreading over the entire border strip and

not tracking down only part of it. (Note that this was discussed with Hamish Lowe and agreed with.)

Reference: Andrew Stewart paragraphs 5.83 and 5.84, page 29

Concern:

Mr Stewart quotes statements from Landcare Research Ltd's reports on the 107 ha site and the 91 ha site, that some of the soils are not particularly suitable for border strip irrigation.

Response:

- 2.4** The use of border strip irrigation on the clay rich soils on the 107 ha site has been addressed in my evidence at paragraph 4.29 and these areas may not be irrigated in winter. The clay rich Ahikouka soils on the 91 ha site will not be used for wastewater irrigation as the new oxidation ponds will be sited in this area.

Reference: Ian Gunn Section 10, pages 31-36 inclusive

Concern:

Mr Gunn expresses concerns about the use of the area outside the stopbank for border strip irrigation of wastewater.

Response:

- 2.5** The berm area outside the stopbank will be subject to relatively infrequent flood events of approximately a five-year return period, once a river edge levee has been formed as part of the border strip development – refer to Mr Archer's evidence. At these times there would be no irrigation of wastewater due to either significant rainfall and/or the wastewater being able to be discharged to the river. Following such a flood event the river flows would be higher for some time allowing the discharge of wastewater to the river to occur and time for the berm area to be rested and the repair of any flood damage to the border strip area to take place. Refer also to paragraph 4.31 in my evidence.
- 2.6** The typical gradient of border strips will be between 1 in 300 and 1 in 500 (refer to Section 6.4.4, page 100 in the AEE). The gradient of the berm area outside the stopbank is approximately 1 in 370. On the berm area it is proposed that the border strips will run parallel to the Ruamahanga River and will be

constructed at a similar slope to that of the berm. Thus major earth movement will not be required to achieve the design grades.

2.7 The methodology to be used for the construction of the border strips is addressed in my evidence at paragraph 4.20. The impact on the soils of moving and replacing relatively deep soils, which exists at this site, is minimal provided this work is not carried during wet conditions. Mr Archer will address flooding risks during construction and the operation of the irrigation system.

2.8 Any differential settlement occurring on the border strips post construction that results in the surface ponding of wastewater, will be rectified.

Reference: Ian Gunn paragraph 12.8, page 44

Concern:

Mr Gunn raises the following issue that was expressed in the officers' Section 42A report "The ability to manage application rates to match soil conditions will not be able to be achieved as is suggested in the AEE as application depths cannot be adjusted in an efficient border strip irrigation system".

Response:

2.9 This issue has been addressed in my supplementary evidence at paragraphs 2.4 and 2.5.

Reference: Donald Bell paragraph 3.1.1, page 3

Concern:

Mr Bell expresses confusion about the modelling of the land treatment system undertaken by HortResearch.

Response:

2.10 This issue was addressed in Dr Green's supplementary evidence at paragraphs 6.1 and 6.2.

Reference: Donald Bell paragraph 3.1.2, page 4

Concern:

Mr Bell expresses concern about the effect of the growth response of pasture under border strip systems.

Response:

- 2.11** I am not aware of the issue of the temperature of irrigation water significantly affecting pasture growth due to the sudden change in soil temperature following irrigation. In this situation the average temperature of the oxidation pond wastewater during summer and autumn is approximately 20 °C which would be higher than the temperature of groundwater that would be commonly used by farmers in this area for irrigation.
- 2.12** With respect to different pasture growth rates for different spray irrigation systems quoted by Mr Bell. These figures are taken from McLaren (2003) *Wairarapa Farmer/Grower Irrigation Decision Making Booklet, A Beginners Guide to Irrigation* and they are based on personal observation rather than actual measurements. In my experience, pasture growth rate is more dependent on factors such as application rate, uniformity of application and the management of the irrigation system.

Reference: Donald Bell paragraph 3.1.3, page 5

Concern:

Mr Bell expresses concern that Landcare Research had only taken three soil sampling points in the berm area.

Response:

- 2.13** The following additional soils investigations were undertaken in the berm area between the stopbank and the Ruamahanga River:
- Investigation undertaken by Opus in 1998 that included six logged holes approximately 1 m deep and two test pits approximately 2.5+ m deep that were logged.
 - Investigation undertaken by Beca in 2000 that included four logged hand augered holes that ranged from 0.5 to 1.9 m deep.
 - Investigations undertaken by Pattle Delamore Partners Ltd that included five logged hand augered holes that ranged from 0.2 to 1.1 m deep in 2000, and the logging of four groundwater monitoring bores ranging in depth from 4.8 to 8.5 m that were installed in the period 2000-2005.

The subsoil profile found in these earlier investigations was consistent with that reported by Landcare Research Ltd. Thus the berm area has been investigated to a similar extent as elsewhere on the MDC property.

- 2.14** In addition, four of the eight infiltration tests undertaken on the 91 ha site that were listed on Table 3 (page 15) of my evidence were undertaken in the berm area.

Reference: Donald Bell paragraph 4.1, page 12

Concern:

Mr Bell questions why drip irrigation has not been considered on the berm area.

Response:

- 2.15** This issue has been addressed in my evidence at paragraphs 7.1 and 7.2. While surface drip irrigation systems are suitable for irrigating row crops such as plantation trees, they are not suitable for irrigating pasture as is proposed by MDC. Buried drip lines (or subsurface drip systems) can be used for irrigating pasture, however being buried, the volume of topsoil available for the uptake of moisture and nutrients is reduced and hence they are unable to fully utilise all of the treatment capacity of the soil/plant root zone.

Reference: Donald Bell paragraph 4.2, page 12

Concern:

Mr Bell questions why short rotation coppice plantations have not been considered for the berm area.

Response:

- 2.16** Firstly a pastoral landuse with a cut-and-carry system has been adopted rather than coppice plantations, because of its ability to remove much greater quantities of nitrogen and phosphorus from the applied wastewater. Secondly in order to maintain the flood capacity of the Ruamahanga River, GWRC is not likely to support the planting of all of the berm area in trees.

Reference: Stuart Forbes submission

Concern:

Mr Forbes questions why centre pivot irrigators have not been adopted for the irrigation of the wastewater instead of border strip irrigation.

Response:

- 2.17** The option of using centre pivot irrigators has been addressed in my evidence at paragraphs 5.2 to 5.12 inclusive and paragraph 7.5. This issue has also been addressed by Mr Lowe in his supplementary evidence (paragraphs 102 and 103) where he said that he did not believe centre pivots were suitable at the Homebush site under the proposed hydraulic regime. (In other words, that significantly less wastewater could be treated if a centre pivot system was used.)

Reference: Hamish Lowe Supplementary Evidence, paragraph 101, page 19

Concern:

Mr Lowe questions why the evidence presented by the applicant makes no reference to the 'NZ Guidelines for the Utilisation of Sewage Effluent on Land'.

Response:

- 2.18** Firstly reference was made to these guidelines in my evidence. Secondly as a contributing author of these guidelines some of the information from the guidelines has been used in my input into the project without being specifically referred to.

DNH Borrie
19 March 2009