

**BEFORE INDEPENDENT HEARING COMMISSIONERS APPOINTED BY THE
CANTERBURY REGIONAL COUNCIL**

IN THE MATTER OF the Resource Management Act 1991

AND

IN THE MATTER OF Submissions and further submissions by Irrigation New
Zealand Inc on Proposed Plan Change 5 to the
Canterbury Land and Water Plan

**MEMORANDUM OF COUNSEL ON BEHALF OF IRRIGATION NEW ZEALAND
INCORPORATED RESPONDING TO PANEL QUESTIONS**

14 SEPTEMBER 2016

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MAY IT PLEASE THE PANEL:

- 1 This memorandum is filed on behalf of Irrigation New Zealand Incorporated (**INZ**), in response to requests from the Panel during INZ's appearance at the Plan Change 5 hearing on 23 August 2016.
- 2 This memorandum responds to the following requests:
 - 2.1 With reference to paragraph 11 of INZ's legal submissions, clarify what changes INZ's preferred relief and alternative relief would make to PC5;
 - 2.2 Provide revised paragraph 97 of Mr McIndoe's primary evidence; and
 - 2.3 Mr McIndoe to provide a summary of the differences between the two methods (being PC5 and that proposed by INZ) in terms of drainage and N leaching, and expand on that as he sees fit.
- 3 Each is addressed in turn below. Counsel apologises for the time it has taken to file this memorandum. The comparison of drainage losses took somewhat longer than anticipated.

Relief Sought

- 4 The changes INZ's preferred relief makes to PC5, as discussed in paragraph 11 of the Opening Legal Submissions¹, are shown in **Appendix 1** to this memorandum.
- 5 The changes INZ's alternative relief makes to PC5, as discussed in paragraph 12 of the Opening Legal Submissions, are shown in **Appendix 2** to this memorandum.
- 6 In both cases INZ does not propose any changes to the rules for border-dyke irrigation.
- 7 For ease of comparison, INZ has adopted the irrigation system terminology used in PC5. INZ's original terminology² captured the same irrigation systems, just using different labelling.

¹ Opening Legal Submissions for INZ, dated 23 August 2016

² Primary Evidence of Ian McIndoe, dated 22 July 2016, at Appendix A

Paragraph 97 of Mr McIndoe's Evidence

- 8 Paragraph 97 of *Mr McIndoe's* primary evidence, dated 22 July 2016, is revised to read (changes shown in underlining and strikethrough):

The proxy uses a 50% trigger point for all systems ~~except travelling irrigators and spraylines~~ and applies a depth of water calculated from the difference between 50% and 90% of soil PAW, except for travelling irrigators and spraylines. I question the approach of working to fixed trigger and refill points, because in practice, most irrigation is not operated in that way, and the alternative rules in Appendix A reflect that. I would expect that in OVERSEER, nearly all irrigation should be on a fixed depth-variable return basis. In practice, once the irrigation system design is established, the depth applied is set, and the irrigation management decision is primarily when to irrigate, not how much to apply.

Difference in Drainage Losses

- 9 In **Annexure A** to this memorandum Mr McIndoe has provided a Second Supplementary Statement of Evidence, being his response to the Panel's request for further information at paragraph 2.3 above.

- 10 Mr McIndoe concludes both INZ's preferred and alternative relief would result in more drainage overall than PC5³. Though this consequentially means some farms will have higher GMP numbers than they might get otherwise, it is not INZ's intention a farm will be able to increase nitrogen loss above current or baseline levels (or what those levels would be if the activity were implementing Good Management Practices). It is submitted this intention is amply demonstrated through a number of INZ's submission points, including in particular:

10.1 Requested changes to the definitions of Baseline GMP Loss Rate⁴ and GMP Loss Rate⁵; and

10.2 Requested changes to Policies 4.36⁶, 4.37⁷, 4.38⁸ and 4.38AA⁹.

³ Annexure A, Second Supplementary Statement of Evidence of Ian McIndoe, dated 14 September 2016, paragraphs 19 and 20

⁴ Submission by INZ on PC5, dated 11 March 2016, at page 2

⁵ Submission by INZ on PC5, dated 11 March 2016, at page 2

⁶ Submission by INZ on PC5, dated 11 March 2016, at page 3

⁷ Submission by INZ on PC5, dated 11 March 2016, at pages 3 and 4

⁸ Submission by INZ on PC5, dated 11 March 2016, at page 4

- 11 INZ's imperative in pursuing changes to the Portal remains achieving an equitable starting point for nutrient reduction requirements – not enabling an increase in nitrogen losses. Therefore, where a Portal-derived number is higher than a nitrogen loss calculation that demonstrates implementation of Good Management Practices, INZ accepts farms should be constrained to a loss rate less than the Portal value.
- 12 INZ submits this is able to be achieved through the current rules. For all activities that require resource consent, the Regional Council retains control¹⁰ or discretion¹¹ over:
- 12.1 methods that limit the nitrogen loss calculation for the farming activity to a rate *not exceeding* the Baseline GMP loss rate; and
- 12.2 methods that require the farming activity to operate *at or below* the GMP Loss Rate¹², where the GMP Loss Rate is less than the Baseline GMP Loss Rate.
- 13 If the Commissioners are concerned about whether the matters of control/discretion clearly convey jurisdiction to restrict losses below a Portal-derived value, it is submitted either of the below options would remedy that concern:
- 13.1 Amend the definitions of Baseline GMP Loss Rate and Good Management Practice Loss Rate in the manner sought by INZ¹³; or
- 13.2 Amend each of Policies 4.36 to 4.38AA and all the relevant matters of control/discretion¹⁴ such that:
- (a) The words *Baseline GMP Loss Rate* are always followed by the words *or a nitrogen loss calculation that demonstrates implementation of Good Management Practices over the baseline period* (as per INZ's requested change to the definition); and
- (b) The words *Good Management Practice Loss Rate* are always followed by the words *or a nitrogen loss calculation that demonstrates implementation of Good Management Practices over the most recent four-year period* (as per INZ's requested change to the definition).

⁹ Submission by INZ on PC5, dated 11 March 2016, at page 4

¹⁰ Matters of Control 4 and 5 in Rules 5.44B, 5.54B and 5.57C (Red, Orange and Green and Light Blue Zones – Lake Zones do not have controlled activity status)

¹¹ Matters of Discretion 5 and 6 in Rules 5.45A, 5.50A, 5.55A and 5.58A (Red, Lake, Orange and Green and Light Blue Zones)

¹² Or 5kg/ha/yr above same for Green and Light Blue Zones

¹³ Submission by INZ on PC5, dated 11 March 2016, at page 2

¹⁴ Matters of Control 5 and 6 in Rules 5.44B, 5.54B and 5.57C (Red, Orange and Green and Light Blue Zones), and matter of discretion 6 in Rules 5.45A, 5.50A, 5.55A and 5.58A (Red, Lake, Orange and Green and Light Blue Zones)

- 14 Whilst the first of these options (amending the definitions) has the attraction of simplicity, it may give rise to unintended consequences given the use of *Baseline GMP Loss Rate*¹⁵ in the conditions for each relevant activity¹⁶. It submitted this can be overcome by limiting the *Baseline GMP Loss Rate* to only the Portal-derived number for the purposes of those activity status conditions. For example, Rule 5.44B Condition (2) would be changed to (suggested addition shown with underlining):

Until 30 June 2020, the nitrogen loss calculation for the part of the property within the Red Nutrient Allocation Zone does not exceed the nitrogen baseline, and from 1 July 2020 the Baseline GMP Loss Rate as estimated by the Farm Portal only.

- 15 It is submitted either option falls well within the spectrum of relief available – most particularly because the outcome is between what would have arisen if INZ's relief had been granted and the provisions of PC5 as notified.
- 16 Caselaw has confirmed the Panel is entitled to make amendments not specifically requested in submissions if:
- (a) the substance of the change was properly raised in submissions on PC5¹⁷;
 - (b) the relief does not go beyond what was reasonably and fairly raised in submissions on PC5¹⁸; and
 - (c) there is no real risk that persons potentially affected by such a change have been denied an effective opportunity to participate in PC5¹⁹.

¹⁵ Counsel notes there may be an error in Rule 5.46A Condition 2, which is the only condition of this kind to refer to *Good Management Practice Loss Rate* rather than *Baseline GMP Loss Rate*, which is what all other equivalent conditions use. The proposed amendment works in this context in any event.

¹⁶ Condition 2 in Rules 5.44B, 5.45A, 5.46A, 5.54B, 5.55A, 5.56AA, 5.57C, 5.58A and 5.58B

¹⁷ *Johnston v Bay of Plenty Regional Council* EnvC Auckland A106/2003, 26 June 2003 at [31], *Royal Forest and Bird Protection Society Inc v Southland District Council* [1997] NZRMA 408 (HC)

¹⁸ *Network Tasman Ltd v Tasman District Council* EnvC Christchurch, C057/08, 12 May 2008 at [18]

¹⁹ *Environmental Defence Society Inc v Otorohanga District Council* [2014] NZEnvC 70 at [47], in applying *Clearwater Resort Ltd v Christchurch City Council* HC Christchurch AP34/02, 14 March 2003 at [66]; also applied in *Palmerston North City Council v Motor Machinists Ltd* [2013] NZHC 1290 at [91]

- 17 It is submitted the amendments proposed above are permissible because constraining farming activities to a nitrogen loss rate reflecting Good Management Practices (regardless of the Farm Portal calculation) was clearly raised by INZ's combined requests to:
- 17.1 alter the definitions of Baseline GMP Loss Rate and Good Management Practice Loss Rate; and
 - 17.2 amend Policies 4.36 to 4.38AA.
- 18 Any potentially affected parties have had the opportunity to participate accordingly.
- 19 In addition, the amendments proposed constitute something "less" than would be granted if INZ's amendment to the irrigation proxy were accepted, such that the Portal always modelled 20% drainage²⁰. Mr McIndoe has previously confirmed all options put forward by INZ are at or an improvement on this²¹.

Direction for Further Analysis

- 20 The Commissioners directed the Officers to undertake comparative analysis of the existing irrigation rule and INZ's preferred and alternative relief. Officers were also asked to ascertain the effect of INZ's relief on farms which are at GMP (referring to the A-grade farms discussed in Ms Harris' evidence as examples).
- 21 To enhance the efficiency of the comparative analysis and avoid the prospect of any confusion as to what should be modelled, INZ is willing to make Mr McIndoe and Ms Phillips available to assist. It is submitted this will benefit all parties including the Commissioners and increase confidence in the results.
- 22 INZ has made this offer directly to Counsel for the Regional Council and is yet to hear whether it has been accepted.



A C Limmer / J R King
Counsel for Irrigation New Zealand Incorporated

²⁰ Submission by INZ on PC5, dated 11 March 2016, at pages 6 and 11
²¹ Primary Evidence of Ian McIndoe, dated 22 July 2016, at paragraph 75

APPENDIX ONE – INZ Preferred Relief

- 1 INZ's Preferred Relief comprises the following:
 - 1.1 Replace the notified Method s28.4 with parts of the Table s28 in Appendix A of *Mr McIndoe's* primary evidence²², so that:
 - (a) *Mr McIndoe's* sprayline irrigator values are used for all soils with a PAW₆₀ at or greater than 60mm; and
 - (b) *Mr McIndoe's* centre pivot irrigator values are used for all soils with a PAW₆₀ of less than 60mm.
 - 1.2 Make consequential amendments to the irrigation proxy to correctly refer to the above changes to Method s28.4²³.
- 2 INZ's Preferred Relief is shown with reference to the latest version of PC5²⁴ and set out in [blue font](#) on pages 8 and 9 below.

²² Primary Evidence of Ian McIndoe on behalf of INZ, dated 22 July 2016.

²³ Amended wording requested shown in the Evidence of Andrew Curtis on behalf of INZ, dated 22 July 2016, Table s28 at page 10

²⁴ Revised Appendix I – Part A, dated 17 August 2016

Table s28 Good Management Practices and Modelling Rules applied by the Farm Portal

Topic	Good Management Practice	OVERSEER® settings, methodologies and rules applied by the Farm Portal to model 'Good Management Practice'	Applicable Farming Activities
Irrigation and water use	Manage the amount and timing of irrigation inputs to meet plant demands and minimise risk of leaching and runoff	<p>The following settings are applied to the <i>Blocks – Irrigation Management</i> page in OVERSEER® for spray irrigation systems:</p> <p>Spray Irrigation</p> <p>In the section “Management Options”:</p> <ul style="list-style-type: none"> • The category “Based On” is set as ‘Soil Water Budget’ • The “Strategy” selected is ‘Trigger Point, Fixed Depth Applied’ • The “Management Systems” selected is ‘User Defined’ and the ‘Depth per application’ and ‘Minimum Return Period’ are set in accordance with Method s28.4 • The “Units” is set at ‘%PAW’ • The “Trigger Point” is set at <u>50%</u> in accordance with Method s28.4 <p>The following rules are also applied to cropping blocks:</p> <ul style="list-style-type: none"> • Irrigation occurs in accordance with Method s28.4 • No irrigation in fallow months • No irrigation of seed crops at time of harvest <p>No irrigation of grain, dried legumes, root vegetables and onions:</p> <ul style="list-style-type: none"> • In the final growing month of crop; or • If the total nitrogen uptake of the crop is $\geq 96\%$ <p>Borderdyke Irrigation</p> <p>The following settings are applied to the <i>Blocks – Irrigation Management</i> page in OVERSEER® for borderdyke irrigation systems:</p> <p>In the section “Management Options”:</p> <ul style="list-style-type: none"> • The “Outwash Management” option is set as ‘No outwash’ • The “Management Systems Definition” is set as ‘User Defined’ • The “Depth per application” is set at ‘85’ • The “Return Period” is set at ‘14’ 	All

Method s28.4 Methodology for the application of irrigation water by spray irrigation systems under Good Management Practice

Irrigation water applied in accordance with the values set out below:

Plant Available Water capacity (mm)	Irrigator type	Irrigation trigger point	Application depth (mm)	Return Period (days)
30	modelled as Centre Pivot systems	55%	15	3
40		60%	15	3
50		65%	15	3
60	modelled as Sprayline irrigation systems	55%	33	7
70		55%	33	7
80		60%	33	7
90		60%	33	7
100		50%	65	14
110		50%	65	14
120		50%	65	14
140		55%	65	14
160		60%	65	14
200		68%	65	14

Comment [JK1]: The entire table is replaced with the relevant parts of Mr McIndoe's Appendix A table, being the centre pivot values for soils <60mm and the sprayline values for soils ≥60mm.

Comment [JK2]: Because the values in Mr McIndoe's table are dependent on PAW and not irrigator type, the *irrigator type* column can be deleted for clarity

APPENDIX TWO – INZ Alternative Relief

- 1 If, however, the Regional Council wishes to retain per-system values, INZ requests (as Alternative Relief) the values in *Mr McIndoe's* Table s28 replace entirely those used in Method s28.4.
- 2 INZ's Alternative Relief is set out in **blue font** on pages 11 and 12 below (again using the latest version of PC5²⁵ as a starting point).
- 3 INZ acknowledges Mr McIndoe's original table²⁶ did not include specific values for micro-irrigation and solid set irrigation systems. INZ considers the centre pivot values can be applied to those systems (as shown in the comment JK4), as they perform at or better than centre pivots at GMP.

²⁵ Revised Appendix I – Part A, dated 17 August 2016

²⁶ Primary Evidence of Ian McIndoe, dated 22 July 2016, at Appendix A

Table s28 Good Management Practices and Modelling Rules applied by the Farm Portal

<p><u>Irrigation and water use</u></p>	<p>Manage the amount and timing of irrigation inputs to meet plant demands and minimise risk of leaching and runoff</p>	<p>The following settings are applied to the <i>Blocks – Irrigation Management</i> page in OVERSEER® for spray irrigation systems:</p> <p>Spray Irrigation</p> <p>In the section "Management Options":</p> <ul style="list-style-type: none"> • The category "Based On" is set as 'Soil Water Budget' • The "Strategy" selected is 'Trigger Point, Fixed Depth Applied' • The "Management Systems" selected is 'User Defined' and the 'Depth per application' and 'Minimum Return Period' are set in accordance with Method s28.4 • The "Units" is set at '%PAW' • The "Trigger Point" is set at '<u>50%</u>' in accordance with Method s28.4 <p>The following rules are also applied to cropping blocks:</p> <ul style="list-style-type: none"> • Irrigation occurs in accordance with Method s28.4 • No irrigation in fallow months • No irrigation of seed crops at time of harvest <p><u>No irrigation of grain, dried legumes, root vegetables and onions:</u></p> <ul style="list-style-type: none"> • In the final growing month of crop; or • If the total nitrogen uptake of the crop is $\geq 96\%$ <p><u>Borderdyke Irrigation</u></p> <p>The following settings are applied to the <i>Blocks – Irrigation Management</i> page in OVERSEER® for borderdyke irrigation systems:</p> <p>In the section "Management Options":</p> <ul style="list-style-type: none"> • The "Outwash Management" option is set as 'No outwash' • The "Management Systems Definition" is set as 'User Defined' • The "Depth per application" is set at '85' • The "Return Period" is set at '14' 	<p>All</p>
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Method s28.4 Methodology for the application of irrigation water by spray irrigation systems under Good Management Practice

Irrigation water applied in accordance with the values set out below:

Comment [JK3]: The entire table is replaced with Mr McIndoe's table as shown

Plant Available Water capacity (mm)	Irrigator type	Irrigation trigger point	Application depth (mm)	Return Period (days)
30	Centre Pivot irrigation systems	55%	15	3
40		60%	15	3
50		65%	15	3
60		59%	15	3
70		62%	15	3
80		65%	15	3
90		64%	15	3
100		66%	15	4
110		68%	15	4
120		65%	15	4
140		69%	15	5
160		72%	15	5
200		77%	15	5
<80	Linear systems	As per centre pivot systems		
80		65%	26	6
90		64%	26	6
100		66%	40	9
110		68%	40	9
120		65%	40	12
140		69%	40	12
160		72%	40	12
200		77%	40	12
<80	Travelling irrigation systems	As per centre pivot systems		
80		50%	50	10
90		50%	50	10
100		50%	50	10
110		50%	50	10
120		55%	45	12
140		55%	45	12
160		55%	45	12
200	60%	45	12	
<60	Sprayline irrigation systems	As per centre pivot systems		
60		55%	33	7
70		55%	33	7
80		60%	33	7
90		60%	33	7
100		50%	65	14
110		50%	65	14
120		50%	65	14
140		55%	65	14
160		60%	65	14
200	68%	65	14	

Comment [JK4]: As explained at paragraph 3 of this Appendix, "micro-irrigation and solid set systems" would be inserted here