

**BEFORE THE ENVIRONMENT COURT
AT WELLINGTON**

**I TE KŌTI TAIAO O AOTEAROA
TE WHANGANUI-A-TARA ROHE**

IN THE MATTER of the Resource Management Act 1991

**AND
IN THE MATTER** of appeals under Clause 14 of Schedule 1 of the
Resource Management Act 1991 against the
decision of the Manawatū-Whanganui Regional
Council on Proposed Plan Change 2 to the One
Plan ("PC 2")

BETWEEN **TE RŪNANGA O RAUKAWA**
(ENV-2021-WLG-00020)

NGĀTI TURANGA
(ENV-2021-WLG-00021)

ANDREW DAY
(ENV-2021-WLG-00022)

WELLINGTON FISH AND GAME COUNCIL
(ENV-2021-WLG-00023)

Appellants

AND **MANAWATŪ-WHANGANUI REGIONAL
COUNCIL**

Respondent

**SUPPLEMENTARY EVIDENCE OF ELIZABETH HELEN PARLATO
FOR NGĀTI TURANGA AND WELLINGTON FISH AND GAME COUNCIL**

Dated: 28 March 2024

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1. QUALIFICATIONS AND EXPERIENCE

- 1.1 My full name is Elizabeth Helen Parlato.
- 1.2 My experience and qualifications are set out in my Statement of Evidence dated 6 November 2023.
- 1.3 I repeat the confirmation given in my evidence that I have read and will comply with the Code of Conduct for Expert Witnesses in the Environment Court Practice Note 2023, and that my evidence has been prepared in compliance with that Code.

2. SCOPE

- 2.1 In his Fifth Statement of Evidence for Manawātū-Whanganui Regional Council (18 March 2024), Professor Horne provides further detail in relation to the number of dairy farms used to undertake his analyses presented in his Supplementary Evidence (17 January 2024).
- 2.2 I have been asked by the Wellington Fish and Game Council (**Fish & Game**) to analyse the farm data provided by Professor Horne and others¹, against Policy 5-8 of the Horizons One Plan (*Regulation of intensive farming land use activities affecting groundwater and surface water quality*). Policy 5-8(a)(i)(D) provides “*Nitrogen leaching maximums must be established in the regional plan which ... are achievable on most farms using good management practices.*”
- 2.3 This evidence assesses whether a recalibrated Table 14.2 would provide Cumulative Nitrogen Leaching Maximums (**CNLMs**) that “*are achievable on most farms using good management practices*” (**GMPs**). I also briefly comment on Professor Horne’s view that the specified reduction pathway will result in faster improvements in water quality than the Table 14.2 pathway.

¹ I address and refer to the relevant evidence below.

3. EVIDENCE

Are Table 14.2 CNLMs achievable on most farms using good management practices?

- 3.1 I understand that the 2012 Environment Court decision on the proposed One Plan appeals accepted that the economic costs of achieving Table 14.2 CNLMs was manageable for a majority of farms.² The evidence presented by Dr Hanly in the current proceedings identifies that the recalibration of Table 14.2 values using more recent versions of Overseer shows what the CNLM values would likely have been, had those versions of Overseer been available when the original table was created.³ Hence, it would not be expected that recalibration of Table 14.2 alone would change the basis for the 2012 decision.
- 3.2 As far as I understand, the question of whether recalibrated Table 14.2 CNLMs are achievable on most farms is something the Court has expressed interest in. I am not aware of evidence currently before the Court that addresses this question across all IFLU types. This analysis has therefore been undertaken with the purpose of estimating the percentage of existing IFLUs that are able to achieve Table 14.2 CNLMs using GMPs (and best management practices, **BMPs**).
- 3.3 To address the question of whether Table 14.2 CNLMs are achievable on most farms using GMPs/BMPs, I have focused on the Year 10 CNLMs because this timeframe (2024–2026, depending on target catchment) most closely aligns with what the Table 14.2 CNLM limits will be for intensive farming land uses (**IFLUs**) when Plan Change 2 (**PC2**) becomes operative.
- 3.4 When undertaking this analysis, I have relied on information provided in the evidence of other witnesses. I have identified those information sources in my evidence presented below.
- 3.5 In Professor Horne's Supplementary Statement of Evidence dated 17 January 2024, he provides the results of an analysis he undertook to estimate the percentage of farms that would have met the *recalibrated* Table 14.2 (Year 1, Year 10 and Year 20 CNLMs) based on 2012 and 2019 Overseer data.⁴ For 2012, the analysis was undertaken for all priority

² Decision of the Environment Court, Manawatū-Wanganui Regional Council Proposed One Plan Appeals, 31 August 2012 at [5-174].

³ Dr Hanly EIC (6 October 2023) at [11](a).

⁴ Professor Horne Supplementary SOE (17 January 2024) at [16]-[21].

catchments: Horowhenua, Rangitikei, Mangatainoka and Upper Manawatū. For 2019, the analysis was undertaken for Horowhenua, Rangitikei and Mangatainoka catchments, with the Upper Manawatū excluded due to insufficient 2019 Overseer data.⁵

- 3.6 In his Fifth Statement of Evidence, Professor Horne provided additional detail about the number of dairy farms in each catchment that he used for his analysis.⁶
- 3.7 Professor Horne estimates that 44% of dairy farms would have met the Table 14.2 Year 10 CNLM in 2012⁷ and that more dairy farms were able to meet their CNLM limit in 2019, which Professor Horne suggests is probably due to adoption of GMPs/BMPs over this period. Professor Horne also notes that in a very approximate sense, the changes show about a 20% improvement in leaching rates across dairy IFLU since the One Plan was introduced – although this does not account for farms in the Upper Manawatū.⁸
- 3.8 While it is not possible to determine the overall proportion of dairy farms that will be able to meet Table 14.2 CNLMs in the absence of recent Upper Manawatū Overseer N-loss estimates, Professor Horne provides additional useful analysis to estimate the percentage of dairy farms who could meet Table 14.2 CNLMs if their 2012 N-leaching losses were reduced by 20%.⁹ Overall, Professor Horne estimates 65% of dairy farms would be able to meet their Table 14.2 Year 10 CNLMs by achieving a 20% reduction in their 2012 N-loss rates.
- 3.9 Professor Horne notes that through his analysis, which involved reviewing a representative number of dairy farms with a particular focus on higher N-leaching farms with more challenging biophysical conditions, he was able to conclude that a 20% reduction can be achieved by farmers adopting a range of extensive GMPs/BMPs, although this will be very onerous in a number of cases.¹⁰
- 3.10 Professor Horne has indicated that he considers approximately 10% of farms may seek to use a discretionary pathway rather than the specified

⁵ Professor Horne Supplementary SOE (17 January 2024) at [19].

⁶ Professor Horne Fifth SOE (18 March 2024), Tables 4 (2012) and 5 (2019) in Appendix.

⁷ Professor Horne Supplementary SOE (17 January 2024), Table 2 at [18].

⁸ Professor Horne Supplementary SOE (17 January 2024) at [21].

⁹ Professor Horne Supplementary SOE (17 January 2024) at [22]–[26], Tables 5 and 6.

¹⁰ Professor Horne Supplementary SOE (17 January 2024) at [24].

reduction pathway.¹¹ With the conservative assumption that 10% of the farms in Professor Horne's analysis of 2012 data will take the discretionary pathway and all of those 10% fall within the 65% that would meet their Table 14.2 Year 10 CNLMs by reducing their N-loss by 20%; an estimated 55% of farms will still meet their Year 10 CNLMs with the specified reduction pathway.

3.11 For my analysis, I have therefore assumed two alternative scenarios for dairy farms:

3.11.1 First, that 65% of dairy farms can achieve their Table 14.2 Year 10 CNLM by implementing a range of GMPs/BMPs.

3.11.2 Second, and more conservatively, that 55% of dairy farms can achieve their Table 14.2 Year 10 CNLM by implementing a range of GMPs/BMPs.

3.12 For other pastoral IFLU (intensive sheep and beef), Professor Horne notes that there is no corresponding data to analyse but that it is relatively easy for these farms to meet their CNLMs.¹² There are currently two consented existing intensive sheep and beef farms in the target catchments, both of which have consented leaching rates below their Year 20 CNLMs. I have therefore assumed that all seven (two consented, five unconsented¹³) existing intensive sheep and beef farms in the target catchments can meet their Year 10 CNLMs.

3.13 Under questioning, Professor Horne said that he thought 12–14 of the 15 unconsented cropping farms¹⁴ would be able to meet their Table 14.2 CNLMs.¹⁵ There is also one consented cropping farm with a consented rate that meets its Year 20 CNLM.¹⁶ I have therefore assumed 13/16 cropping farms can meet their Year 10 CNLMs.

3.14 Dr Jolly identifies that the number of commercial vegetable growing (**CVG**) farms that are able to meet their Table 14.2 CNLM is approximately two

¹¹ Notes of Evidence, page 840, lines 1-3 and Professor Horne Supplementary Statement of Evidence (17 January 2024) at [31].

¹² Professor Horne Supplementary SOE (17 January 2024) at [15].

¹³ Ms Foster EIC (7 October 2023) at [67], Table 1.

¹⁴ Ms Foster EIC (7 October 2023) at [67], Table 1.

¹⁵ Notes of Evidence, page 825, lines 32-33.

¹⁶ Ms Foster Supplementary Statement of Evidence (17 January 2021), Appendix A.

because the nitrogen modelling by Bloomer et al. (2020)¹⁷ indicated that only the potatoes and onions system can meet the recalibrated Table 14.2 CNLMs.¹⁸ I have therefore assumed that two of the estimated 49 existing CVG activities¹⁹ can meet their Year 10 CNLMs.

- 3.15 However, I note that this estimate of 2/49 CVG activities being able to meet the Table 14.2 CNLM is likely to be conservative. This is because Dr Jolly's evidence identifies that substantial reductions in N-loss can be achieved by CVG through GMPs/BMPs^{20,21} – suggesting that more farms are likely to be able to meet their Table 14.2 CNLMs with implementation of these practices. In addition, Appendix B in the evidence of Ms Holmes shows the Bloomer et al. (2020) modelling estimated that the N-loss rate for intensive vegetable rotations post-2019 was 44 kg N/ha/yr.²² 44 kg N/ha/yr is the Year 10 CNLM value for LUC Class 1 land in the PC2 Provisions – Council Proposed Version.²³ I note that the Bloomer modelling was performed using Overseer Version 6.3.2, whereas the proposed provisions specify that the proposed Table 14.2 values were derived using Overseer 6.2.3.²⁴
- 3.16 The values I used to assess whether the Year 10 Table 14.2 CNLM values are achievable on most farms using GMPs/BMPs are provided in Table 1 below.

¹⁷ Dan Bloomer, Georgia O'Brien, and Luke Posthuma. (2020). Modelled loss of nutrients from vegetable growing scenarios in Horowhenua: OverseerFM 6.3.2 Modelling of Representative Rotations within Hokio_1a, Hokio_1b, and Ohau_1b WMSZ (Page Bloomer, January 2020); provided in Dr Jolly's Statement of Reply Evidence (13 November 2023) at Attachment A.

¹⁸ Dr Jolly Supplementary SOE (17 January 2024) at [10].

¹⁹ Ms Foster EIC, paragraph [67], Table 1 (48 unconsented) and Ms Foster Supplementary Statement of Evidence (17 January 2021), Appendix A which shows one consented CVG operation but information on the Table 14.2 CNLM and consented N-loss rate is not included.

²⁰ Dr Jolly EIC (6 October 2023), at [67]-[69].

²¹ Dr Jolly Statement of Reply Evidence, (13 November 2023) at Attachment B (Section 42A Technical Report of Anne-Maree Jolly, 4 September 2020), at [29], Table 2.

²² Ms Holmes EIC (13 October 2023), Appendix B Catchment Water Quality Modelling: supporting evidence of Dr Claire Conwell (Easton, 2020).

²³ I understand that this value could change with Overseer version changes.

²⁴ Horizons Regional Council Plan Change 2 Provisions – Council Proposed Version, Table 14.2.

Table 1. Estimated numbers and percentages of existing IFLU activities in target catchments able to meet the Table 14.2 Year 10 CNLM. Two alternative scenarios (a, 65%; b, 55%) are considered for dairy IFLU to recognise uncertainty in the overall proportion of dairy activities that can achieve their CNLMs across all target catchments.

IFLU	Estimated number of existing IFLU activities	Estimated number meeting Table 14.2 Year 10 CNLM	Estimated percentage meeting Table 14.2 Year 10 CNLM
CVG	49	2	4%
Cropping	16	13	81%
Intensive sheep & beef	7	7	100%
Dairy (a)	360 ²⁵	234	65%
Dairy (b)	360 ²⁵	198	55%
Total	432	(a) 256	(a) 59%
		(b) 220	(b) 51%

3.17 The reliability of these results is dependent on the extent to which the values derived from evidence (as outlined above) are an accurate representation of IFLU activities throughout the target catchments.

3.18 A key unknown is whether 55% (or more) existing dairy activities can indeed meet their Table 14.2 Year 10 CNLMs with GMP/BMPs. As noted in paragraph [3.8], it is not possible to ascertain the overall proportion of dairy farms that can meet Table 14.2 CNLMs in the absence of recent Upper Manawatū Overseer N-loss estimates. Hence, assumptions are required as to the proportion that can meet the CNLMs across all target catchments.

3.19 Professor Horne's evidence indicates that by implementing GMPs/BMPs, a 20% reduction from 2012 N-loss rates is achievable, which is in turn likely to

²⁵ Ms Foster EIC (7 October 2023) at [67], Table 1 (167 unconsented) and Ms Foster Supplementary Statement of Evidence (17 January 2021), Appendix A (193 consented).

result in approximately 65% of dairy IFLU meeting their Year 10 CNLM (scenario (a) in Table 1 above).

- 3.20 Paragraph [3.10] above identifies that if conservative assumptions are made about the number of those 65% of farms that would instead choose the discretionary pathway (i.e. would not reduce N-loss by 20% from 2012 N-loss rates), an estimated 55% of dairy IFLU would still meet their Year 10 CNLM (scenario (b) in Table 1 above).
- 3.21 In addition, 2019 Overseer data for the other three catchments indicates that approximately 63% of dairy IFLU would be able to meet their Year 10 CNLM without any further practice change.²⁶ While that percentage does not include Upper Manawatū—so cannot be considered representative of all affected dairy IFLU—it does provide additional information to help benchmark what is achievable over three of the four catchments.
- 3.22 Furthermore, in Professor Horne's Evidence in Chief, he explains that an analysis he undertook for the Council-level hearing indicated that approximately 65–70% of dairy farmers would be able to comply with the recalibrated Table 14.2 if they implemented the appropriate GMPs/BMPs.²⁷
- 3.23 Taking this information together, and acknowledging uncertainties, I consider it reasonable to assume at least 55% of dairy IFLU will be able to meet their Table 14.2 Year 10 CNLM with the implementation of GMPs/BMPs.
- 3.24 As shown in Table 1, this analysis indicates that if 55% (or more) existing dairy farms can meet their Table 14.2 Year 10 CNLMs, then meeting Table 14.2 Year 10 CNLMS is achievable for 51% (or more) of all existing IFLU activities. If “most” is considered greater than 50%, then these results indicate that the Table 14.2 Year 10 CNLMs are achievable on most farms using GMPs/BMPs (across all IFLU types).

²⁶ Calculated using the percentages provided in Professor Horne's Supplementary Statement of Evidence (17 January 2024), Table 3 and farm numbers provided in Professor Horne's Fifth Statement of Evidence (18 March 2024), Table 5.

²⁷ Professor Horne EIC (6 October 2023) at [42].

Will the specified reduction pathway result in faster improvements in water quality than the Table 14.2 pathway?

- 3.25 In the hearing, Professor Horne expressed the view that the specified reduction pathway is likely to result in faster improvements in water quality than the Table 14.2 pathway.²⁸
- 3.26 Professor Horne explains in his Fifth Statement of Evidence that the analysis he presented in his January 2024 evidence demonstrated that a significant proportion of dairy IFLU in the region (53%) would achieve their Year 20 CNLMs if they used the specified reduction pathway. Given that the specified reduction pathway requires the specified reduction in N-loss to be achieved within 2–3 years, Professor Horne considered that these farms would consequently achieve their Year 20 CNLMs more quickly than the 10 or more years allowed by Table 14.2.²⁹
- 3.27 Professor Horne's assessment does not consider that some dairy farmers are likely to continue to choose the Table 14.2 pathway in situations where Table 14.2 is less onerous (and provides more time to make reductions) than the specified reduction pathway. That is, for situations where the specified reduction pathway requires N-loss rates to be at or below the Table 14.2 Year 20 CNLM (i.e., greater N-loss reductions than are required by the Table 14.2 Year 10 CNLM), it is likely that farmers will instead choose the Table 14.2 pathway.
- 3.28 Consequently, I consider there will not necessarily be faster reductions in farm N-loss (or faster associated water quality improvements) with the specified reduction pathway because the Table 14.2 pathway will also be available.

Dr Elizabeth Helen Parlato

²⁸ Notes of Evidence, page 839, lines 12-19.